



# Misoperations Webinar Series

Session 4 – August 23, 2018

# Objective

## Review Session

- Check in and see how the webinars are meeting industry needs
- Review scenarios that generated lot of questions and discussions

# How this will work

## 1. Check in

- Pre survey summary
- Direct feedback

## 2. Live Examples


- Scenario
- Live Poll
- Explanation
- Questions

Callers will be muted on entry. To ask questions:

### 1. Chat:

Use the chat feature to type in questions. Be aware that the chat is visible to all attendees.

### 2. Voice:

In the WebEx participant panel click the mute icon  (red means muted) to unmute yourself and ask a question.

**Pro tip: You can use the chat feature to ask the moderator to unmute you so you can ask a question.**

### 3. Email:

send to [relaymisops@wecc.biz](mailto:relaymisops@wecc.biz) emails will be addressed after today's session.


# Check In

1. What have you found useful?
2. Where do we have opportunities to improve?
3. What topic(s) would you like us to add or review?

Continue to send feedback in to:

[relaymisop@wecc.biz](mailto:relaymisop@wecc.biz)

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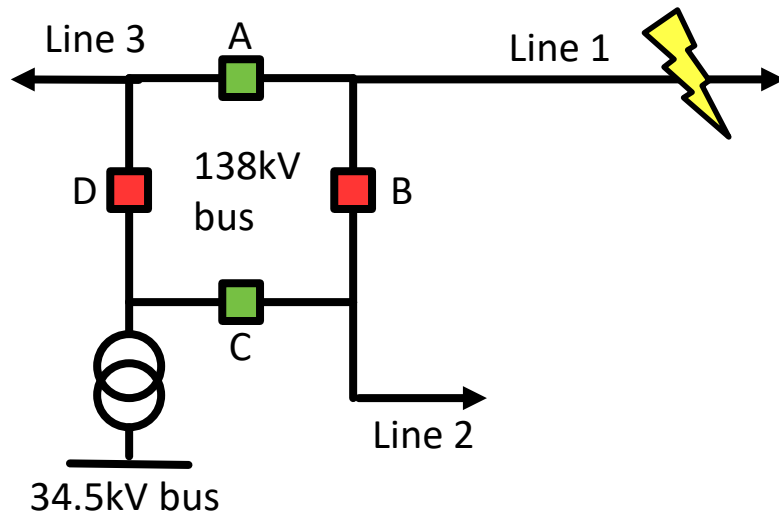


## Practice Session

# Breaker Failure 01 (August 23)

## Question

Permanent line fault occurs 3 miles out on Line 1. Line 1 relaying operated as intended, however, Breaker B fails to clear the fault because of a failed trip coil. Breaker failure relaying then initiated local clearing breaker C and remote transfer tripping of line 2. How many operations and misoperations should be reported?



- A. One operation, no misoperations to report.
- B. Three operations, one of these operations is a reportable misoperation.
- C. Two operations, one of these operations is a reportable misoperation.
- D. Two operations, no misoperations to report.

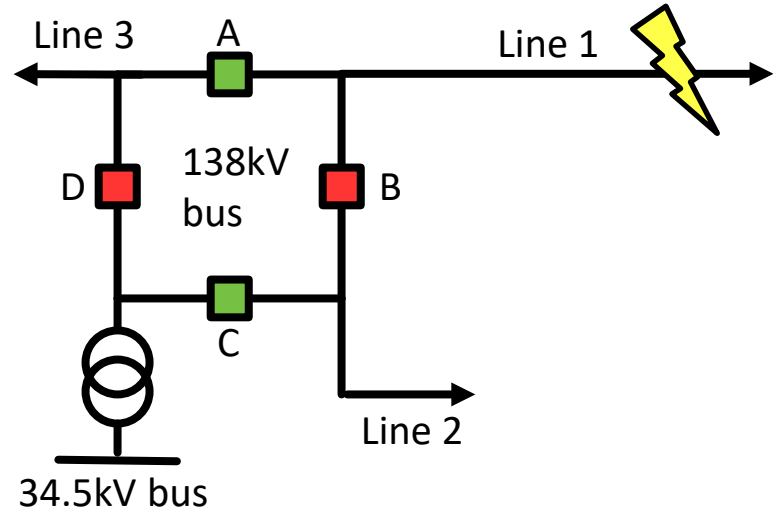
# Breaker Failure 01 (August 23)

## Answer and Explanation

Answer: C. Two operations; one of these operations is a reportable misoperation.

Explanation: Line 1 protection had one misoperation since breaker B's failure was in the trip coil; breaker failure protection had one correct operation with transfer tripping of remote ends.

Reference: PRC-004-5(i), page 17, ex. 1.



Note: Since the Breaker Failure Protection resulted from a failed trip coil that is included as part of the Composite Protection System, this is a misoperation.

# Generation 01 (August 23)

## Question

During an off-nominal frequency condition, Generator Foxtrot 1 is tripped by the loss of field protection while the field is intact. How many operations and misoperations should be reported?

- A. This is not a reportable event
- B. One operation, no misoperations to report
- C. One operation, this is a reportable misoperation
- D. None of the above



# Generation 01 (August 23)

## Answer and Explanation

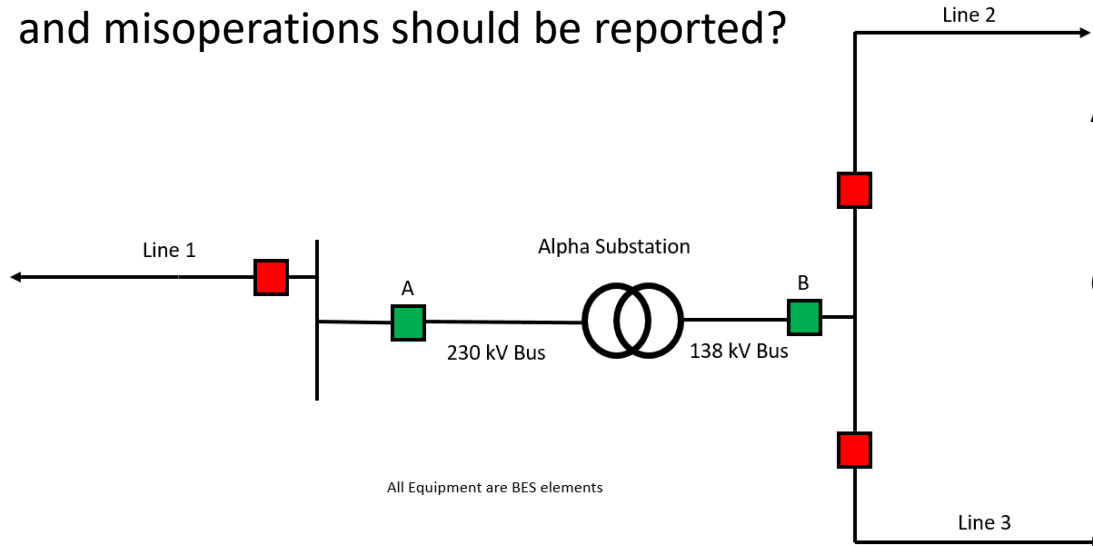
Answer: C. One operation, this is a reportable misoperation.

Explanation: This is based on PRC-004-005(i), page 22, ex. 6B Unnecessary Trip – Other Than Fault misoperation.

# Field Testing 01 (August 23)

## Question

Breaker A was recently replaced. Testing of the transformer differential was not performed due to insufficient load. As loading increased hours later (all personnel had left the site), the differential tripped due to a CT wiring error. How many operations and misoperations should be reported?



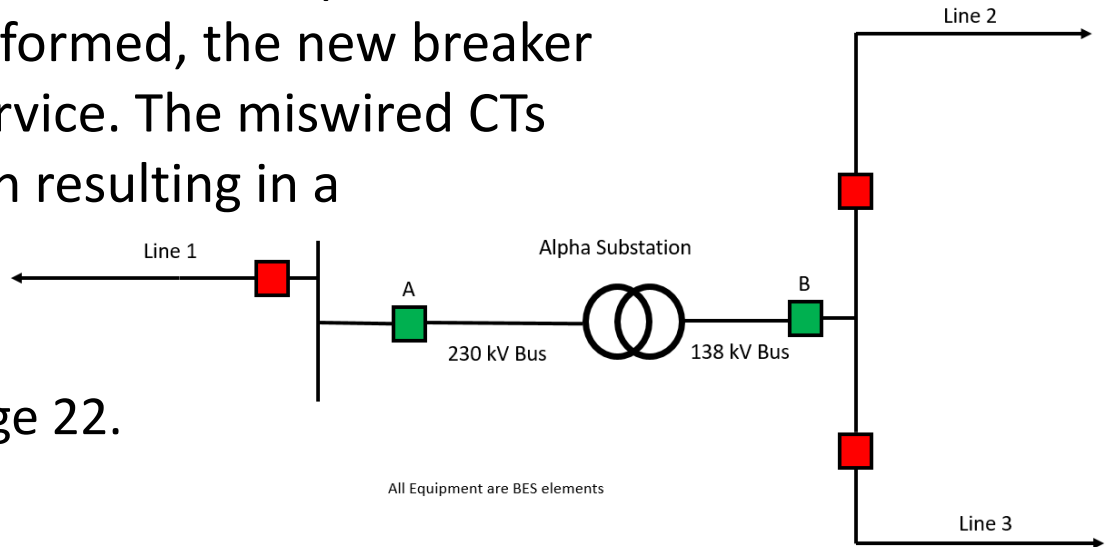
- A. Two operations, one of which is a reportable misoperation
- B. This is not a reportable event
- C. One operation, no misoperations to report
- D. One operation, this operation is a reportable misoperation

# Field Testing

## Answer and Explanation

Answer: D. One operation, this operation is a reportable misoperation.

Explanation: Even though the work to replace the breaker was recently performed, the new breaker was being placed into service. The miswired CTs were an As-Left condition resulting in a misoperation.

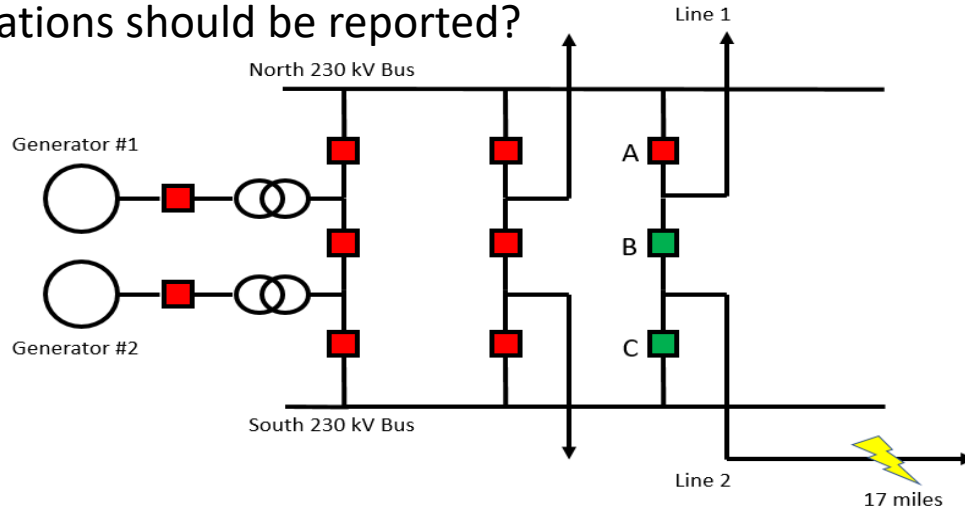


Reference: PRC-004-5(i), page 22.

# Composite Protection 01 (August 23)

## Question

The Composite Protection System for line 2 includes two independent high-speed pilot systems as well as step distance and time-overcurrent schemes. During a Fault on this line, the two pilot systems fail to operate and the time-overcurrent scheme clears the Fault with no generating units or other Elements tripping. How many operations and misoperations should be reported?



- One operation, this is a reportable misoperation
- Two operations, one of these operations is a reportable misoperation
- One operation, no misoperation to report
- Two operations, no misoperation to report

# Composite Protection 01 (August 23)

## Answer and Explanation

Answer: C. One operation, no misoperation to report.

Explanation: Even though the pilot systems failed to operate, other components of the Composite Protection System cleared the fault. No other Composite Protection System operated.

Note: While there are no misoperations to report, it is expected the pilots systems are examined to determine why they did not clear the fault.

# Protection/Control 01 (August 23)

## Question

A 230/115kV bank was removed from service due to a failed sudden-pressure relay. How many operations and misoperations should be reported?

- A. One operation. This operation is a reportable misoperation
- B. This is a non-reportable event
- C. One operation, no misoperations to report
- D. None of the above

# Protection/Control 01 (August 23)

## Answer and Explanation

Answer: B. This is a non-reportable event.

Explanation: A sudden pressure relay does not respond to electrical quantities and therefore does not qualify as a Protection System operation or misoperation.

# Protection or Control (August 23)

Reverse Power Relay operations during normal unit shutdown

Control System

Reverse Power Relay – control function – PRC-004-5(i), page 23, example 8a

Normal bypass operation on series capacitor

Control System

NERC Document - Questions and Answers about Consistent Protection System Misoperation Reporting, page 1, question 4

Circuit breaker trip coil

Protection System

Circuit Breaker Trip Coil – NERC Glossary of Terms: Protection System - trip coil is included as part of the Composite Protection System

SF6 gas monitor relay

Control System

SF6 gas monitor relay – NERC Glossary of Terms: Protection System - control relay that is not responding to electrical quantities

Reverse power relay failure tripping generator

Protection System


Reverse Power Relay – protection function – PRC-004-5(i), page 22, example 6d



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# Coming Soon....

- Slides and information from today's call
  - Email to misops info mailing list
    - To be added, email [support@wecc.biz](mailto:support@wecc.biz)
  - Posted on WECC website (Performance Analysis [page](#))
- Misoperations Webinar Series call #5
  - Thursday, October 25, 2018 10:00-11:30 a.m.
  - Topic suggestions, issues, ideas for scenarios: email to [relaymisops@wecc.biz](mailto:relaymisops@wecc.biz)