



Misoperations Webinar Series

Session 1 – February 22, 2018

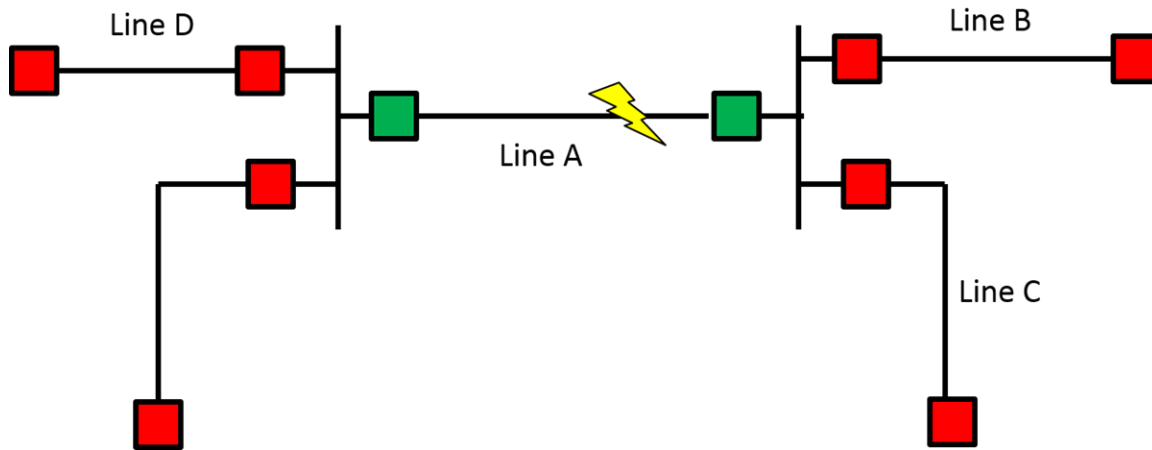
Objective

Align understanding of how misoperations and operations are defined.

- Look at real-world scenarios to identify common issues
- Explain concepts and provide reference material
- Test concepts on new scenarios

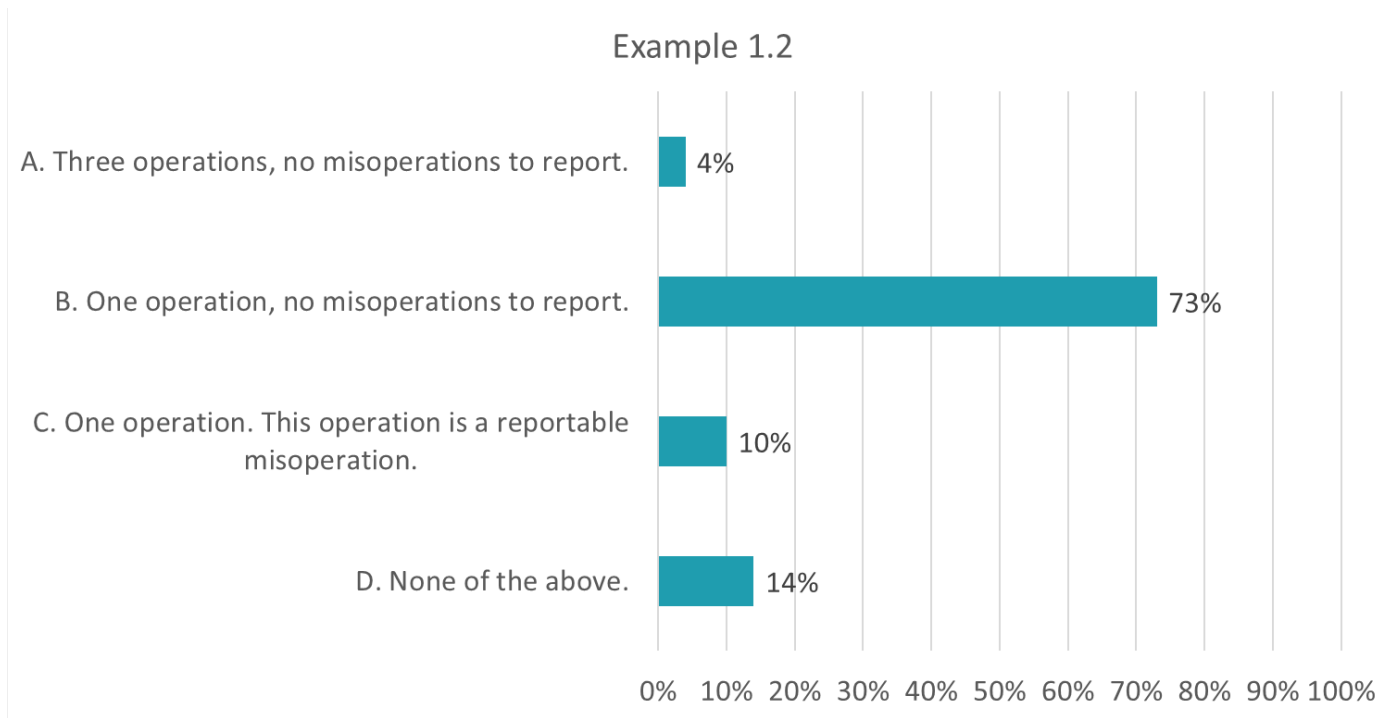
Example 1.2 Question

A permanent fault occurs on Line A. Both ends trip and reclose (two attempts) to lockout. How many operations and misoperations should be reported?



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

Example 1.2 Results



Example 1.2 Answer & Explanation

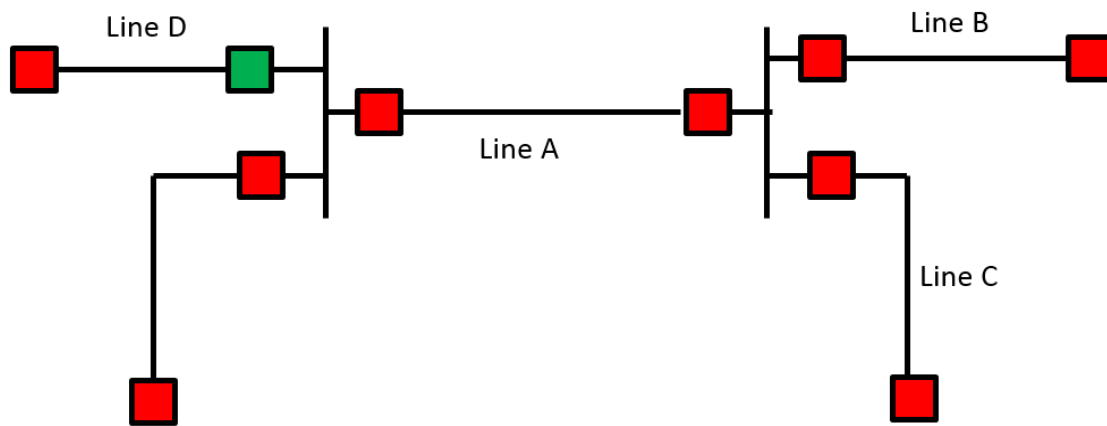
Answer: B. One operation, no misoperations to report.

Explanation: When reclosing is applied (automatic or manual), a sequence of reclosing and tripping associated with isolating a faulted system Element is counted as a single operation. Multiple unintended operations of an Element due to this sequence of reclosing and tripping would also be counted as a single operation.

Reference: MIDAS Reporting Template – Definition of Protection System Operation.

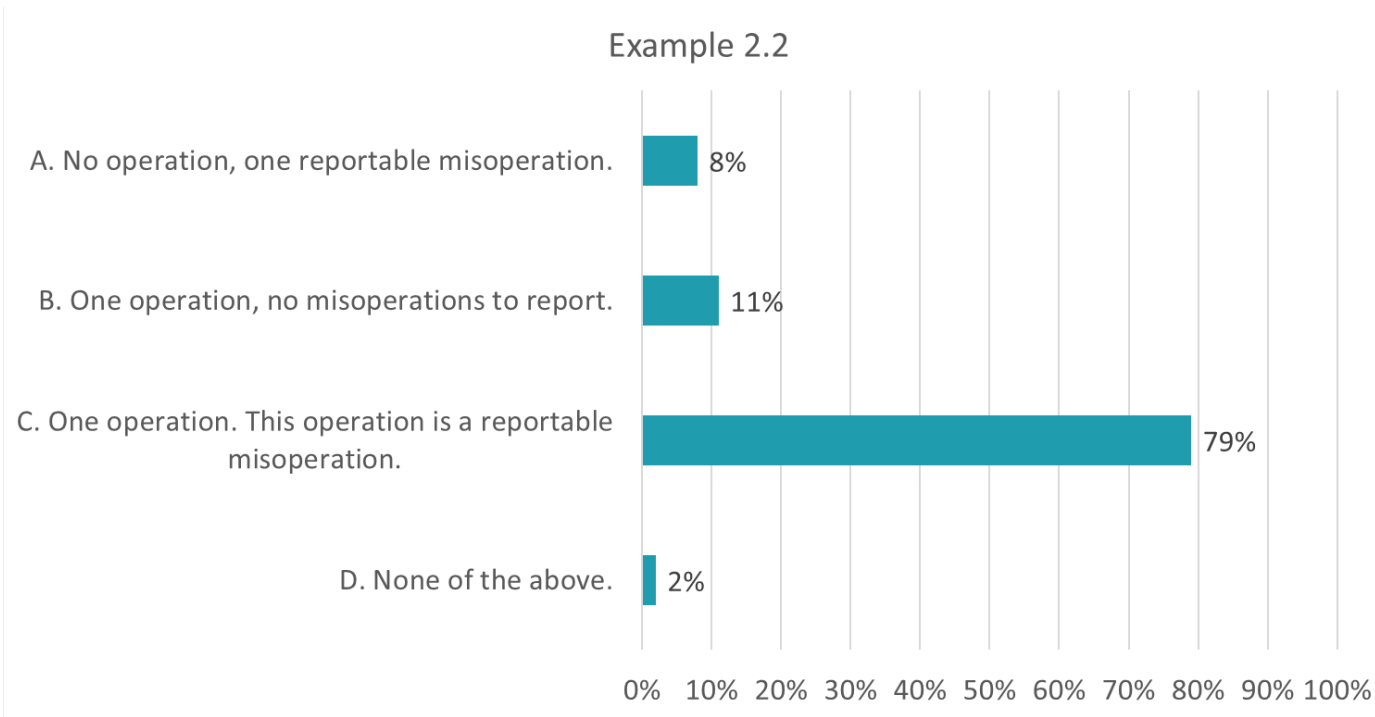
Example 2.2 Question

A breaker on Line D trips due to a failed protection system relay with no fault. How many operations and misoperations should be reported?



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

Example 2.2 Results



Example 2.2 Answer & Explanation

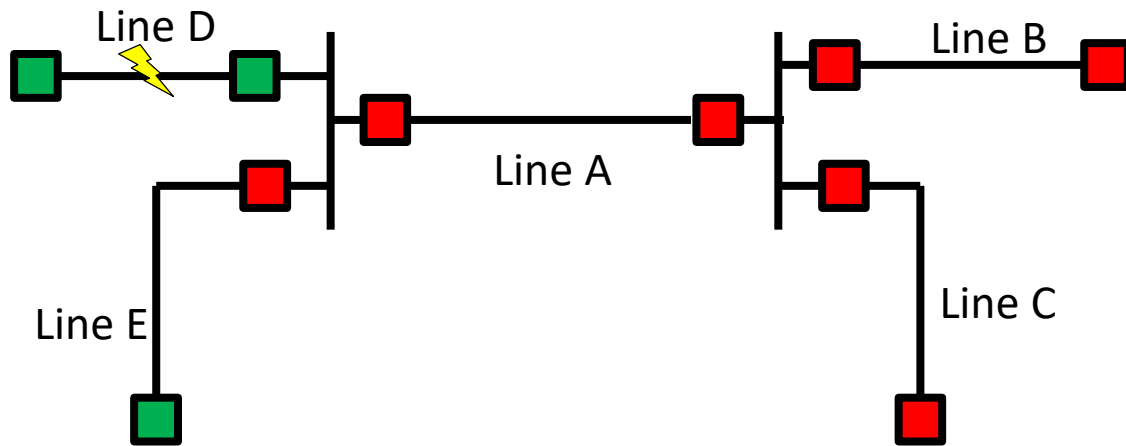
Answer: C. One operation. This operation is a reportable misoperation. This misoperation would be categorized as Relay Failure/Malfunction.

Explanation: This category includes Misoperations due to improper operation of the relays themselves. These may be due to component failures, physical damage to a device, firmware problems, or manufacturer errors. Examples would include Misoperations caused by changes in relay characteristic due to capacitor aging, misfiring thyristors, relay power supply failure, or internal wiring/logic error. Failures of auxiliary tripping relays fall under this category.

Reference: MIDAS Reporting Template – Tab 3 - Definition of Relay failure/Malfunction misoperation.

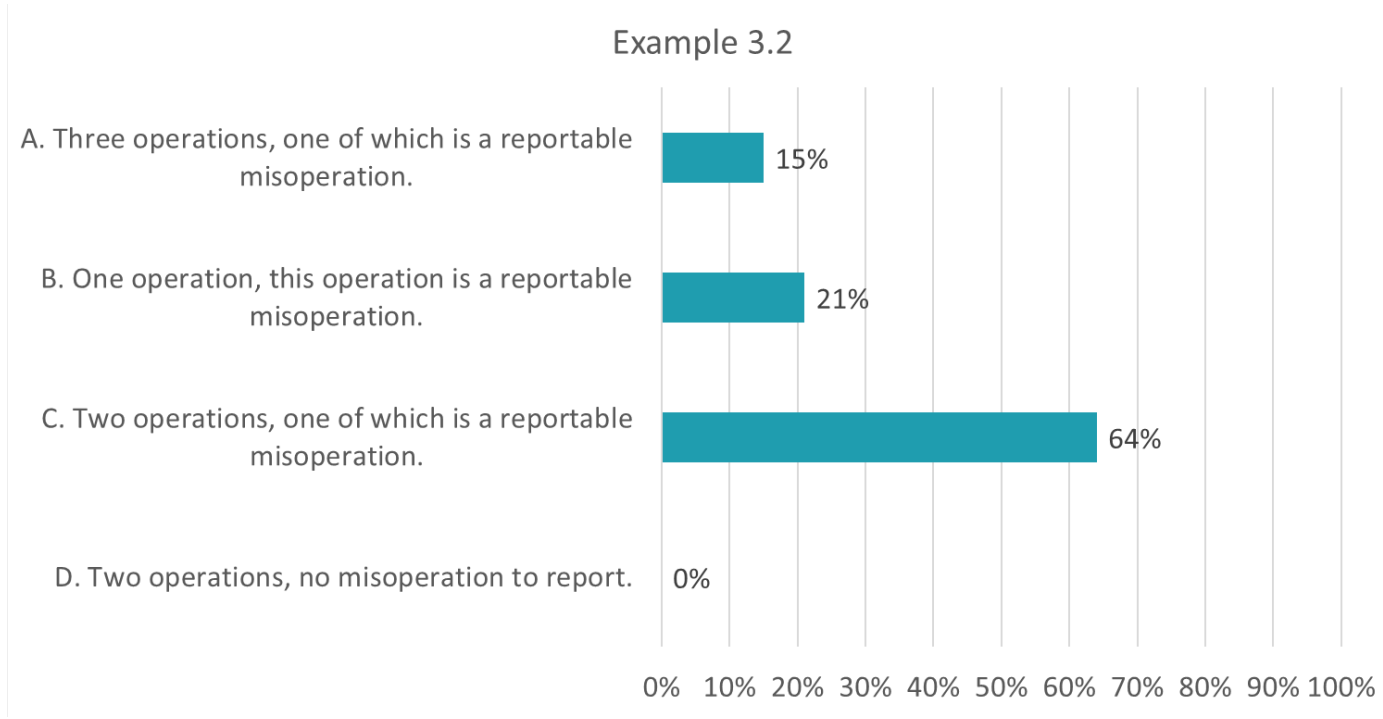
Example 3.2 Question

A permanent fault occurs on Line D. The Line D breakers trip, but a breaker on Line E overreaches and trips incorrectly. How many operations and misoperations should be reported?



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

Example 3.2 Results



Example 3.2 Answer & Explanation

Answer: C. Two operations, one of which is a reportable misoperation.

Explanation: The unintended operation of a protection system for a fault outside the zone it is designed to protect is an operation. This unintended operation is a misoperation that must be reported to the MIDAS Portal.

Reference: MIDAS Reporting Template – Tab 3 - Definition of Operation.

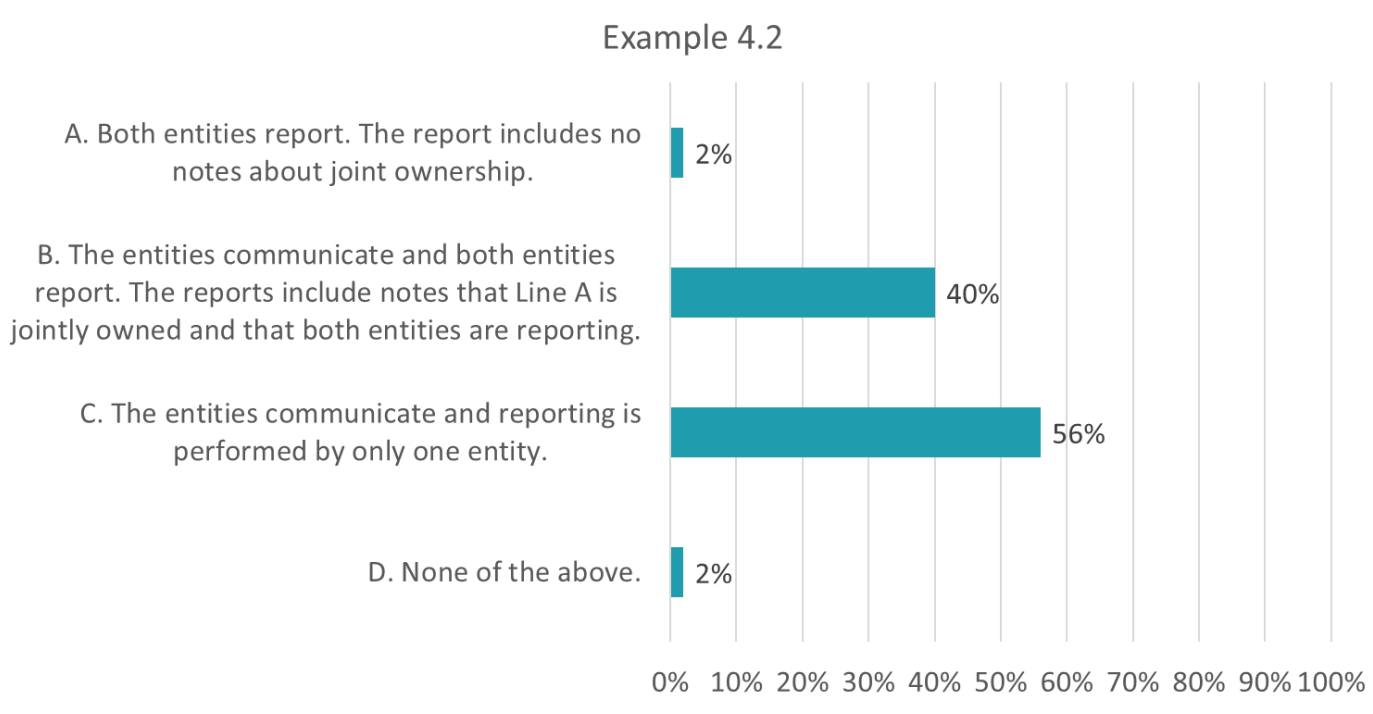
Example 4.2 Question

Entity 1 and Entity 2 jointly own Line A. An event on Line A results in two operations, one of which is a misoperation.

Which entity performs the reporting for this event?

- A. Both entities report. The report includes no notes about joint ownership.
- B. The entities communicate and both entities report. The reports include notes that Line A is jointly owned and that both entities are reporting.
- C. The entities communicate and reporting is performed by only one entity.
- D. None of the above.

Example 4.2 Results



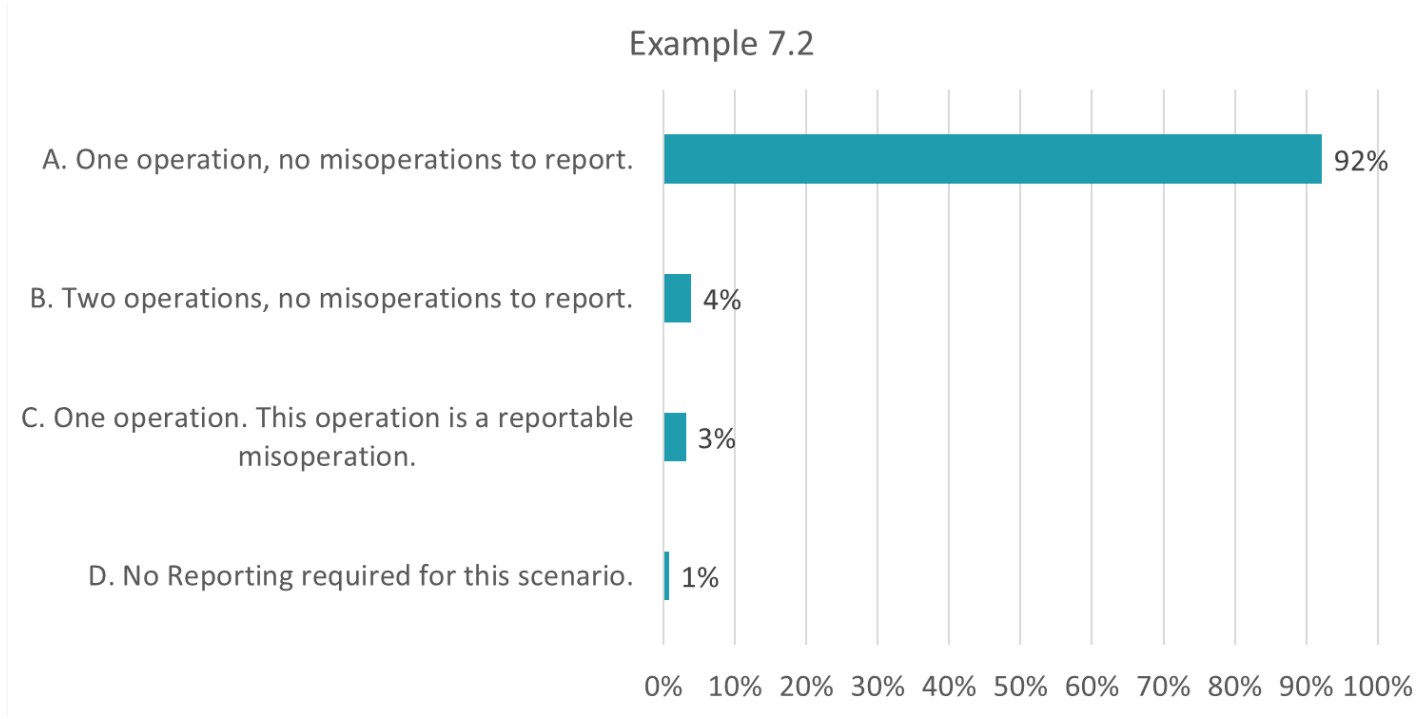
Example 4.2 Answer & Explanation

Answer: C. The entities communicate and reporting is performed by only one entity.

Explanation: If both entities report, the event will be double counted. In the Event Description field, include details such as the line is jointly owned, the other involved entity, communication took place between the two companies, etc.

Note: Submission to MIDAS should not be confused with documentation for compliance purposes.

Example 7.2 Poll



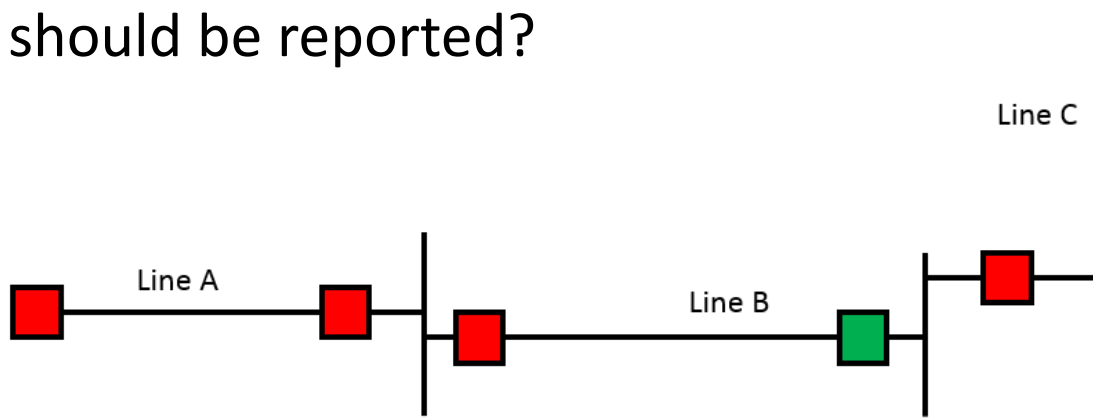
Example 7.2 Answer & Explanation

Answer: A. One operation, no misoperations to report.

Explanation: When reclosing is applied (automatic or manual), a sequence of reclosing and tripping associated with isolating a faulted system Element is counted as a single operation. Multiple unintended operations of an Element due to this sequence of reclosing and tripping would also be counted as a single operation.

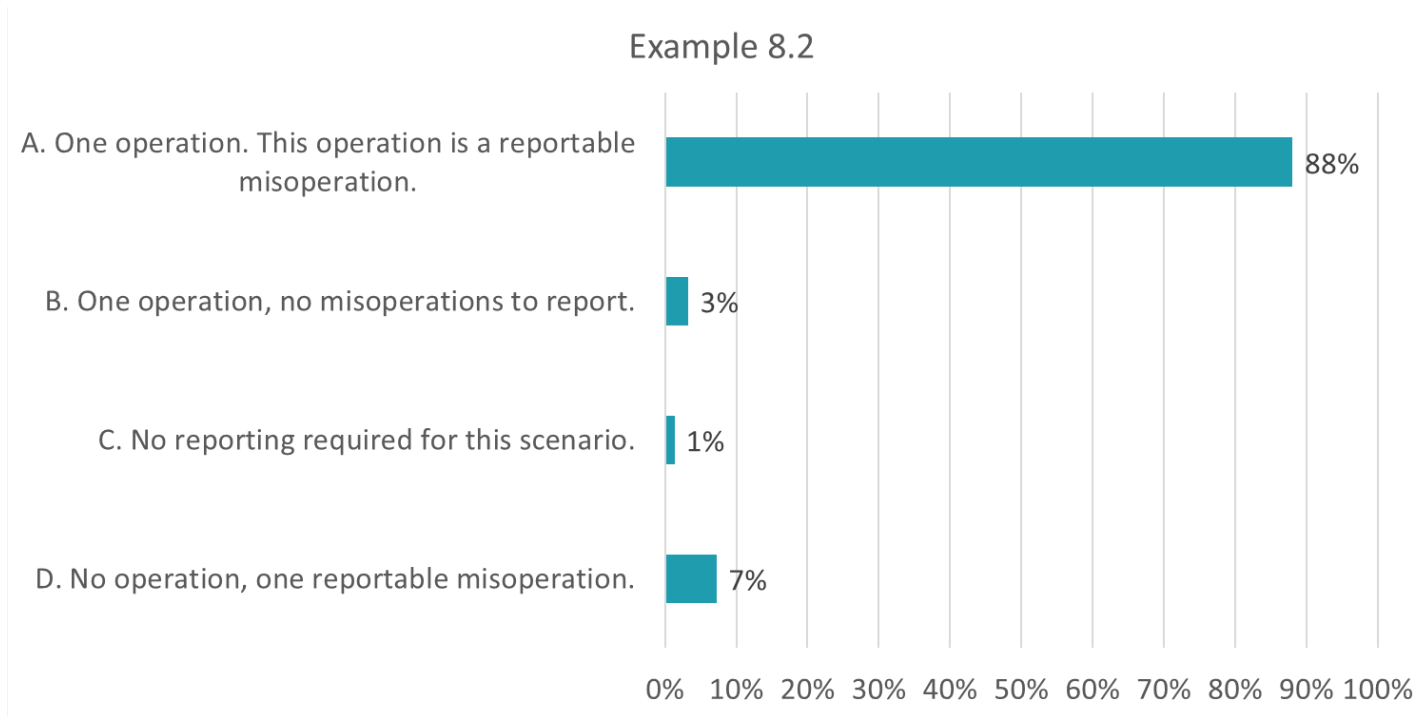
Example 8.2 Question

A failed protection system relay causes a breaker on Line B to open with no fault. How many operations and misoperations should be reported?



- A. One operation. This operation is a reportable misoperation.
- B. One operation, no misoperations to report.
- C. No reporting required for this scenario.
- D. No operation, one reportable misoperation.

Example 8.2 Poll



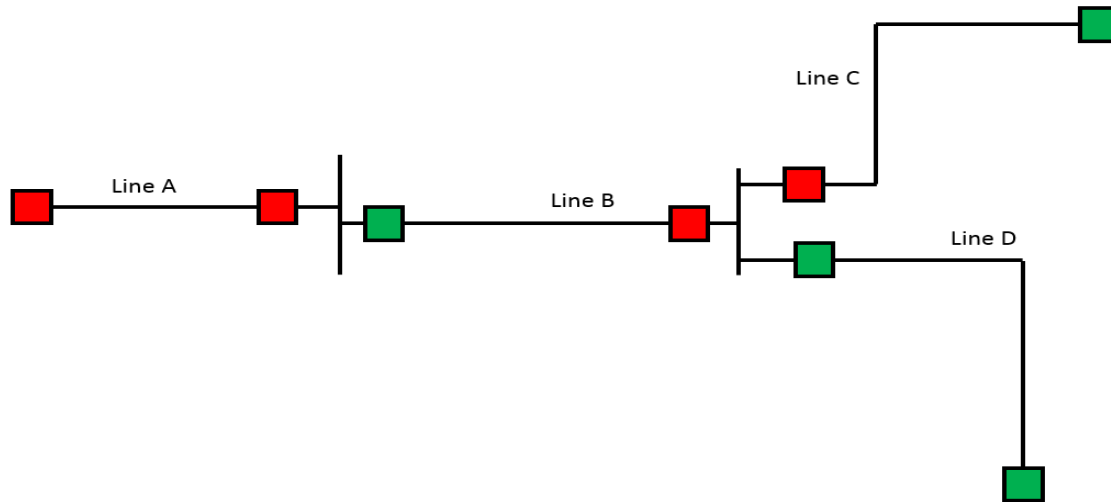
Example 8.2 Answer and Explanation

Answer: A. One operation. This operation is a reportable misoperation.

Explanation: This category includes Misoperations due to improper operation of the relays themselves. These may be due to component failures, physical damage to a device, firmware problems, or manufacturer errors. Examples would include Misoperations caused by changes in relay characteristic due to capacitor aging, misfiring thyristors, relay power supply failure, or internal wiring/logic error. Failures of auxiliary tripping relays fall under this category.

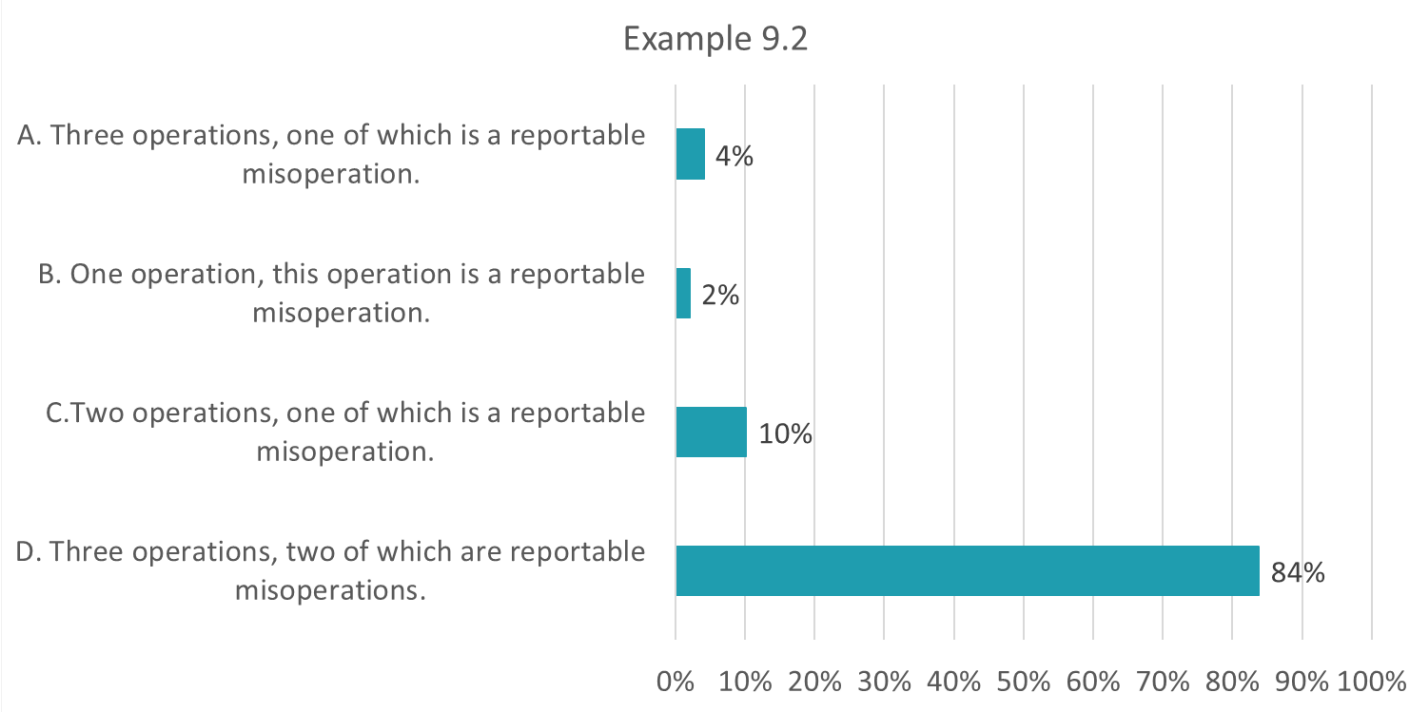
Example 9.2 Question

A permanent fault occurs on Line D. Line D breakers trip, but breakers on line B and C overreach and trip. How many operations and misoperations should be reported?



- Three operations, one of which is a reportable misoperation.
- One operation, this operation is a reportable misoperation.
- Two operations, one of which is a reportable misoperation.
- Three operations, two of which are reportable misoperations.

Example 9.2 Poll



Example 9.2 Answer and Explanation

Answer: D. Three operations, two of which are reportable misoperations.

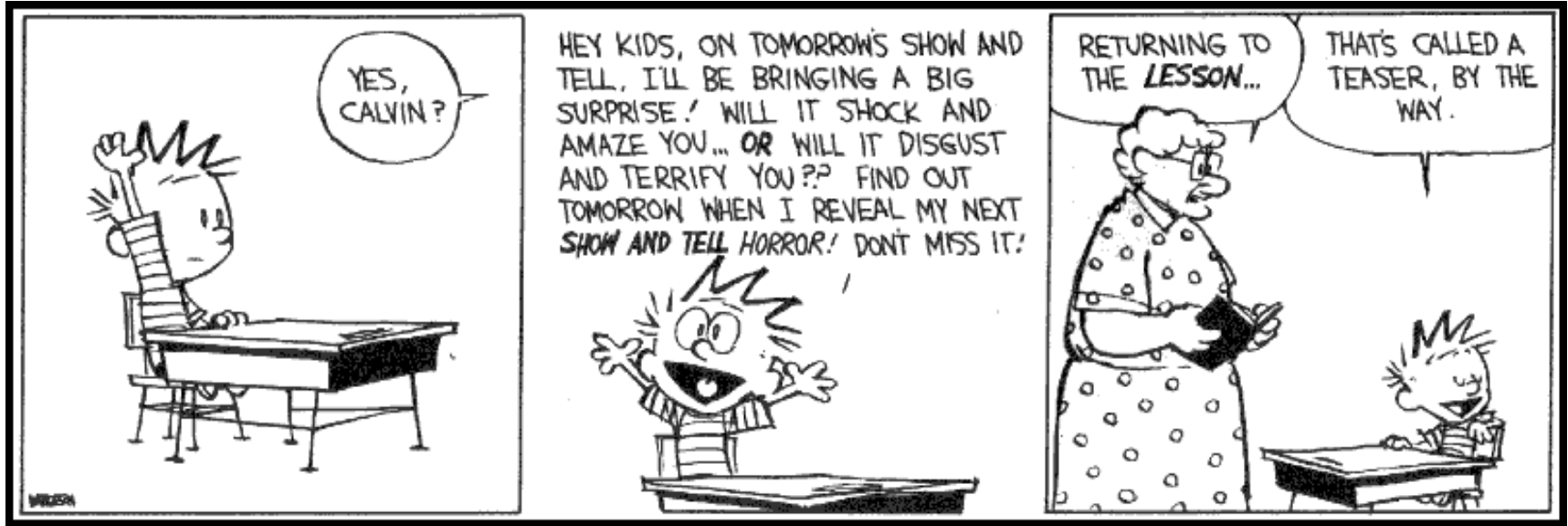
Explanation: The unintended operation of a protection system for a fault outside the zone it is designed to protect is an operation. This unintended operation is a misoperation that must be reported to the MIDAS Portal.

Results

Ex	Topic	Pre-Call	2/22
1/7	Sequence of reclosing	73%	92%
2/8	Relay failure/malfunction	79%	88%
3/9	Unintended operation outside protection zone	64%	84%
4	Joint ownership	56%	

Takeaway

- Seem to have good alignment on first 3 examples
- Breaker failure should be part of a future webinar
- Separating Generation and Transmission topics would be helpful



Watterson, B. (1995, Oct). Calvin and Hobbes. Retrieved from <http://3e.org/feeds/ch/95/9510.htm>

Coming Up....

Coming Up....

- Slides and information from today's call
 - Email to misops info mailing list
 - To be added, email support@wecc.biz
 - Posted on WECC website (Performance Analysis page)
- Misoperations Webinar Series call #2
 - Thursday, April 26, 2018 at 10-11:30 a.m. MT
 - Issue ideas/suggested scenarios, email jhanson@wecc.biz
 - (subject: Misops Webinar)
- Save the date - WECC Misoperations Workshop June 5-6, 2018