

Interpretation for IEEE Standards Interpretation for IEEE Std 1366™-2003 IEEE Guide for Electric Power Distribution Reliability Indices

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Interpretation Request #1

CAIDI calculation: Customers Experiencing a Sustained Outage

1,000 customers were affected by an outage. 500 are restored in 30 minutes. Then 30 minutes later the same restored 500 customers lose power due to a "Bad test". Then 30 minutes later ALL 1,000 customers are restored power.

Customer Minutes = 75,000 (Outage lasted 90 minutes total)

| | | | | |
|--------|-------|----|-------|-----|
| CESO= | 1,000 | or | 1,500 | ??? |
| CAIDI= | 75 | or | 50 | ??? |

Interpretation Response #1

The interpretation that follows is very similar to the Step Restoration Example in 5.3.2.

First, your "Customers Experiencing a Sustained Outage" is not a correct statement in accordance to the definitions in IEEE Std 1366-2003, 3. An outage is defined in 3.16 and note 1 states that it may or may not cause an interruption of service to customers. This example is referring to an interruption (3.7) of customers. A loss of service to a customer, or customers, is defined as an Interruption. Also, what you are referring to as CESO, is defined as CI (Customers Interrupted) in IEEE 1366-2003, 4.1.

In your example, the base NT (Total number of customers served for the area) would be 1,000. 500 customers are interrupted for the entire 90 minutes. This is 500 CI (customers interrupted) and 45,000 CMI (customer minutes interrupted).

500 customers are interrupted for the first 30 minutes. This is 500 CI and 15,000 CMI. Those same 500 customers are again interrupted for 30 additional minutes (minutes 60-90). This is 500 CI and 15,000 CMI.

The indices for this interruption would be:

$$CI = 500 + 500 + 500 = 1,500$$

$$CMI = 15,000 + 45,000 + 15,000 = 75,000$$

$$CAIDI (4.2.3) = CMI/CI = 75,000/1,500 = 50 \text{ minutes}$$

$$SAIFI (4.2.1) = CI/NT = (500 + 500 + 500)/1,000 = 1.5$$