

## M-9

### Protection System Misoperations Rate

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|--|---|--|--|
| <b>Submittal Date</b>  | Submitted February 27, 2009   |  |  |
| <b>Proposal Type</b><br>Is this a proposed new metric, a revision to an existing metric, or a proposal for a type of analysis?                     | New <input type="checkbox"/>  | Revision <input checked="" type="checkbox"/> | Metric Analysis <input type="checkbox"/> |
| <b>Definition</b>  | The metric is the ratio of protection system misoperations to total protection system operations.   |  |  |
| <b>New: Rating Criteria</b><br>Was "Metric or Analysis description and "How will this metric or analysis demonstrate or indicate BPS reliability?" | <ul style="list-style-type: none"> <li>• <b>Red (actionable)</b>: The misoperations rate for NERC shows a statistically significant increase compared to the past four years for multiple consecutive years.</li> <li>• <b>Yellow (monitor)</b>: The NERC misoperations rate shows a statistically significant increase <u>or</u> the misoperations rate for more than one RE shows a statistically significant increase compared to the past four years for one year.</li> <li>• <b>White (stable)</b>: There is no statistically significant difference in the NERC misoperations rate compared to the past four years (there may be a numerical change in the NERC misoperations rate), <u>and no more than one RE shows a statistically significant increase compared to previous 4 years.</u></li> <li>• <b>Green (good/improving)</b>: There is a statistically significant decreasing trend in the NERC misoperations rate and <u>no more than one RE shows a statistically significant increase compared to previous 4 years, or</u> the misoperations rate is zero.</li> </ul> |  |  |
| <b>Purpose</b>   | The purpose of the Protection System Misoperations metric is to calculate a misoperations rate to determine the relative performance of protection system operations and allow NERC to identify concerning or improving trends. The misoperations rate provides a consistent way to trend misoperations and to normalize for weather and other factors that can influence the count.  |  |  |
| <b>Formula or Type of Statistical Analysis</b>   | The ratio of protection system misoperations to total protection system operations.   |  |  |

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Protection System Misoperations Rate

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|   | $\text{Misoperation Rate} = \frac{\text{Protection System Misoperations Count}}{\text{Total Protection System Operations Count}} *$ <p>*This count includes instances where a relay failed to operate to prevent potential divide by 0 scenarios. Change in misoperation rate is statistically tested by the large sample test for population proportion.</p> |
| <b>Time Horizon</b>                         | Quarterly and annual  |
| <b>Metric Start Time or Baseline</b>        | Historical time frame   |
| <b>Data Collection Interval and Roll Up</b> | Misoperations and the total number of operations are currently reported to MIDAS in compliance with the Section 1600 Data Request.  |
| <b>Ease of Collection</b>                   | Leverages data already collected under Section 1600 Data Request  |
| <b>Aggregation</b>                          | Results could be presented by voltage level on a Regional Entity and/or Interconnection basis   |
| <b>Links to NERC Standard</b>               | None  |
| <b>Data Source</b>                          | Misoperations Information Data Analysis System (MIDAS)  |
| <b>Data to be Submitted By</b>              | Registered GOs, TOs and DPs   |
| <b>Review History</b>                       | <p>Reviewed February 19, 2025</p> <p>Revision October 19, 2022</p> <p>Reviewed August 20, 2013</p>  |

| PAS and NERC Staff Use   |   |                 |            |            |          |                 |
|--|---|-----------------|------------|------------|----------|-----------------|
| Need for Validation or Pilot   | Yes, need to validate completeness and consistency of historical data across each region. |                 |            |            |          |                 |
| <b>SMART Rating</b><br>PAS SMART rating of proposed metric, metric revision, or new metric analysis method | Total Score   | Specific/Simple | Measurable | Attainable | Relevant | Tangible/Timely |
|  | 14  | 3               | 3          | 3          | 3        | 2               |
| Publications and Documentation   | State of Reliability Report   |                 |            |            |          |                 |

## ADDENDUM - Rating Criteria Chart

| Annual increases/decreases are statistically significant compared to prior four years | NERC Decreasing | NERC Stable | NERC Increasing (current year only) | NERC Increasing (2 or more consecutive years) |        |            |
|---|-----------------|-------------|-------------------------------------|---|--------|------------|
| <b>0 or 1 RE Increasing</b>   |                 |             |                                     |   | RED    | Actionable |
|   |                 |             |                                     |   | YELLOW | Monitor    |
|   |                 |             |                                     |   | WHITE  | Stable     |
|   |                 |             |                                     |   | GREEN  | Improving  |
| <b>2 or more RE Increasing</b>  |                 |             |                                     |   |        |            |