

<b>M-9</b>			
Protection System Misoperations Rate			
<b>Submittal Date</b>	Reviewed August 20, 2013, Submitted February 27, 2009		
<b>Proposal Type</b> 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"/> October 19, 2022	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> 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.		

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<b>Formula or Type of Statistical Analysis</b>	<p>The ratio of protection system misoperations to total protection system operations.</p> $\text{Misoperation Rate} = \frac{\text{Protection System Misoperations Count}}{\text{Total Protection System Operations Count}} *$ <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

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> 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
<b>Publications and Documentation</b>	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>					<b>RED</b>	Actionable
<b>2 or more RE Increasing</b>					<b>YELLOW</b>	Monitor
					<b>WHITE</b>	Stable
					<b>GREEN</b>	Improving