

ALR4-1 Automatic AC Transmission Outages Caused by Protection System Equipment-Related Misoperations

Metric Number	ALR4-1
Submittal Date	February 27, 2009; revised September 2010
Sponsor Group (OC, PC or subgroup name)	RMWG
Short Title	Misoperation Rate for EHV Transmission Outages
Metric Description	Percent of AC transmission protection system misoperations (for automatic transmission outages 200 kV and above, including AC circuits and transformers, where all transformer low-side voltage levels are 200 kV and above)
Purpose	The purpose of this metric is to gauge the performance of transmission protection systems on the bulk power system by reporting the percentage of misoperations related to automatic transmission outages.
How will it be suited to indicate performance?	The misoperation percentage provides an indication of the relative performance of transmission protection systems, specifically protection system misoperations as a ratio of total protection system operations. In the future after a few years of data collection, a target benchmark percentage could be established.
Formula	Percent transmission misoperations = number of misoperations divided by the total number of automatic outages (which is equal to correct operations plus misoperations).
Time Horizon	Historical perspective
Metric Start Time or Baseline and Roll Up	The first year data becomes available, which is 2008 for the TADS data. Misoperation data for PRC-004 and PRC-016 has been annually collected prior to 2008.
Data Collection Interval and Roll Up	The total number of automatic outages is obtained from the NERC TADS database and the number of misoperations is obtained from PRC-004 reporting. TADS reporting is currently mandatory through Section 1600 of the NERC Rules of Procedure. Misoperations are currently reported to the Regional Entities for compliance to standards PRC-003, -004 and -016.
Ease of Collection	Each Regional Entity currently collects misoperation data regularly per PRC-003, -004 and -016. NERC TADS data has been collected since 2008.
Aggregation	Results could be presented by year on a Regional Entity and/or Interconnection basis.
Linkage to NERC Standard	PRC-003, -004, and -016. It should be noted that this metric would change accordingly with the NERC SPCS recommendations associated with these

three reliability standards. Changes to these three standards are scheduled to be processed sometime in the foreseeable future.

Linkage to Data Source NERC Transmission Availability Data System (TADS) and the Regional Entities' misoperation databases from PRC-003, PRC-004 and PRC-016.

Need for Validation or Pilot Yes, need to validate completeness and consistency of historical data across each Regional Entity. A pilot run should be performed.

Data Submitting Entity Transmission Owner and Generator Owner

SMART Rating	Total Score	Specific/Simple	Measurable	Attainable	Relevant	Tangible/Timely
	15	3	3	3	3	3

Reporting

Style (look and feel) Bar charts

Publications and Documentation This metric will be included in NERC RMWG reports, and may be included in the annual NERC LTRA report.