ALR6-16 Transmission System Unavailability

Metric Number	ALR6-16
Submittal Date	May 8, 2009 Revised: December 3, 2010
Sponsor Group (OC, PC or subgroup name)	SERC Reliability Corporation
Short Title	Transmission System Unavailability
Metric Description	Overall percent of time transmission system Elements (i.e., AC circuits and Transformers 200 kV and above) are unavailable for service (out of service) due to Sustained Automatic Outages, and Non-Automatic Outages. Momentary outages would not be included in this calculation.
Purpose	To determine the percent of time that the transmission system operated at 200 kV and above is unavailable due to Automatic Sustained Outages and Non-Automatic Outages broken down into its components of Planned and Operational Outages.
How will it be suited to indicate performance?	The unavailability is the percentage of time the entire transmission system is not available (i.e., out of service) for the transmission of electricity. The relative percentage provides an indication of the overall unavailability of the transmission system operated at 200 kV and above. The three component outage types will be plotted in a stacked bar format to show the relative impact on the total unavailability. The various Elements, AC Circuits and Transformers, will calculated and plotted separately.
Formula	The percent of time transmission system Elements (i.e. AC circuits and Transformers) operated at 200 kV and above are unavailable is calculated as follows:

$$\text{Unavailability (in \%)} = \frac{\text{Total hours out-of-service}}{\text{Total facility-hours}} \times 100$$

where,

Total facility-hours = hours in a year X number of facilities reported

Total hours out-of-service = A summation of the hours out-of-service during the year for all of the facilities (i.e. AC circuits and Transformers)

Example: For a year with 365 days (or 8,760 hours) and a system with 90 facilities (e.g. AC circuits) that had 5,000 total facility-hours out-of-service due to 1,000 hours of Sustained Automatic Outages, 3,500 hours of Planned Outages, and 500 hours of Operational Outages.

Total facility-hours = (8,760 hours in a year) X (90 facilities) = 788,400

$$\text{Unavailability} = \frac{5,000}{788,400} \times 100 = 0.63\%$$ |

Time Horizon	Historical perspective
Metric Start Time or Baseline and Roll Up	Year 2010
Data Collection Interval and Roll Up	Data collection is through the NERC TADS procedure. Metric calculation is one value for each Interconnection (Eastern, Western, Texas, and Québec) for the aggregate of facilities 200 kV and above. The metric would be reported on the same interval as TADS reports.
Ease of Collection	The TADS database makes this metric easily reportable on a uniform basis.
Aggregation	Reported on an aggregate basis by Regional Entity, Interconnection (Eastern, Western, Texas, and Québec) and NERC.
Linkage to NERC Standard	None
Linkage to Data Source	NERC TADS data base http://www.nerc.com/docs/pc/tadswg/Data_Reporting_Instr_Manual_09-29-09.pdf
Need for Validation or Pilot	Yes, this metric will be reviewed by the RMWG after five years from first implementation to assess whether it provides useful information for determining the performance of the bulk power system. In the event that the RMWG concludes that a metric is no longer useful, the metric will be withdrawn and posted as a considered but not advanced metric, or a metric may be modified if there are shortcomings identified from the review.
Data Submitting Entity	Transmission Owner via TADS reporting procedure

SMART Rating	Total Score	Specific/ Simple	Measurable	Attainable	Relevant	Tangible/ Timely
	13	3	3	3	2	2

Reporting

Style (look and feel)	Bar charts, with possible trend lines added in the future
Publications and Documentation	This metric will be included in NERC metrics reports.