

M-16			
Element Unavailability Percentage			
Submittal Date	Reviewed October 16, 2019, Submitted December 2, 2015		
Proposal Type	New <input type="checkbox"/>	Revision <input checked="" type="checkbox"/> December 21, 2022	Metric Analysis <input type="checkbox"/>
Definition	This metric is calculated by determining the overall percent of time transmission system elements (i.e., ac lines and transformers 200 kV and above) that are unavailable for service due to sustained automatic and operational outages. Momentary outages are not considered in this metric.		
Rating Criteria	<ul style="list-style-type: none"> • Red (actionable): Two or more consecutive years of statistically significant percentage increase relative to prior four-year average. • Yellow (monitor): First year of statistically significant percentage increase relative to the prior four-year average. • White (stable): No statistically significant change relative to prior four-year average. • Green (good/improving): Statistically significant percentage decrease relative to prior four-year average or zero. 		
Purpose	To determine the percentage of time Bulk Electric System AC Transmission Elements operated at 200kV or above that is unavailable when outages due to automatic and operational events are considered.		
Formula or Type of Statistical Analysis	<p>Part A: The percent of Bulk Electric System AC Transmission Elements operated at 200kV or above that is unavailable due to Sustained Automatic and Operational outages, is calculated as follows:</p> $UPC \text{ (in \%)} = 1 - \frac{\text{Total Sustained Automatic Element Outage Hours} + \text{Total Operational Outage Hours}}{\text{Total Element Hours}} \times 100.$ <p>where,</p> <p>Part B: The percent of Bulk Electric System AC Transmission Elements operated at 200kV or above that is available due to Sustained Automatic and Non-Automatic outages, is calculated as follows:</p>		

M-16

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	<p>Availability (in %) = 100 – UPC</p> <p>The APC, the Total Sustained Element Outage Hours and the Total Element Hours are defined in the TADS Data Reporting Instructions.</p>
Time Horizon	Five year rolling average
Metric Start Time or Baseline	Historical time frame
Data Collection Interval and Roll Up	The TADS data provides the total duration of sustained automatic and operational transmission system outages for 200 kV and above.
Ease of Collection	The TADS database makes this metric easily reportable on a uniform basis.
Aggregation	Results could be presented by normalized counts on a Regional Entity basis, Interconnection basis, or NERC wide basis.
Links to NERC Standard	None
Data Source	The NERC TADS definitions and data.
Data to be Submitted By	Entities submitting NERC TADS data.

PAS and NERC Staff Use						
Need for Validation or Pilot	No, the data and results are already being reported via the TADS process.					
SMART Rating 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	2	2
Publications and Documentation	State of Reliability Report					