

ALR1-5 System Voltage Performance

Metric Number	ALR1-5					
Submittal Date	May 8,2009					
Sponsor Group	RMWG					
Short Title	Transmission System Voltage Profile					
Metric Description	Measure the transmission system voltage performance over time					
Purpose	Measure the transmission system voltage performance (either absolute or per unit of a nominal value) over time which provides an indication of the reactive capability applied to the transmission system. Record the amount of time that system voltage is outside a predetermined band around nominal.					
How will it be suited to indicate performance?	Measuring the transmission system voltage level over time provides an indication of the capability of reactive resources (both static and dynamic) applied to the transmission system. Wide fluctuations in voltage levels during off peak to on peak load cycles may indicate inadequate reactive resources necessary to maintain stable voltage profiles.					
Formula	<p>At select transmission system nodes (e.g., busses), record one-minute average node (bus) voltage for positive sequence, phase-to-phase RMS (root-mean-square) value. Record the number of minutes the actual voltage level is outside a predetermined range around nominal.</p> <p>Guidance would be necessary to establish a measurement process. It would be done at a Region level. The Region would define the nodes for measurement and establish the acceptable bandwidth. The Regions would provide the data and results to NERC.</p>					
Time Horizon	Real time, operating horizon					
Metric Start Time or Baseline	Start when the guidance document has been developed and data is first available					
Data Collection Interval and Roll Up	Voltage readings recorded in one minute intervals. Graphs plotted with voltage vs. time for each bus monitored. Number of minute's voltage outside the predetermined range of nominal totaled per reporting period. This would be further developed and documented by Regions.					
Ease of Collection	RMWG will work with all the entities involved, including the Transmission Operators, Reliability Coordinators, and the Regional Entities to ensure the applicable voltage bandwidths are specified and critical nodes (busses) are designated to monitor. Data will be collected through EMS and/or SCADA system readings and archived for reporting on a monthly basis.					
Aggregation	Total minutes node (bus) voltage is outside the range of nominal is aggregated per node (bus) and by voltage class. No aggregation possible for actual node (bus) voltage, but critical nodes (busses) can be identified that provide maximum indication of system voltage performance.					
Linkage to NERC Standard	VAR-001					
Linkage to Data Source	EMS and/or SCADA system data readily available. Recording and storage system may be required but should be available.					
Need for Validation or Pilot	Data pilot and validation are required. Questionnaires were sent to RCWG to define number of busses and specific bandwidths.					
Data Submitting Entity	RMWG will work with all the entities involved, including the Transmission Operators, Reliability Coordinators, and the Regional Entities to ensure the applicable voltage bandwidths are specified and the options are evaluated on the appropriate data submitting and collecting entities.					
SMART Rating	Total Score	Specific/Simple	Measurable	Attainable	Relevant	Tangible/Timely
	14	3	3	3	3	2

Reporting

Style (look and feel)	Line graphs of actual values or deviations from nominal. Bar charts for total time outside a range of nominal.
Publications and Documentation	This metric will be included in NERC RMWG reports