

Essential Reliability Services Working Group (ERSWG) 2017-2018 Reference Document – **DRAFT**

This page contains action items from the 2016 Work Plan. No language changes to the Sufficiency Guideline section are needed as it is copied over from 2016 work plan. The only additions will be status bullets with wording such as, **'completed'**, **'updated'**, **'removed'** and the respective text following the status.

Sufficiency Guidelines - (Carried over from 2016)	
Existing Tasks	<p>ERSWG Tasks:</p> <ul style="list-style-type: none"> • The 2016 whitepaper on potential methods for quantifying sufficient amounts of essential reliability services should be used to inform the development of a “sufficiency guideline” that will suggest a means to quantify adequate levels of essential reliability services • A report documenting recommendations for quantifying adequate levels of ERS
Required Data (Owner)	<ul style="list-style-type: none"> • All measures 1-4, and 6 • Measure - 7 to be discussed separately
Reporting	<p>Final Report with Acceptance by NERC Board - December 2017</p> <ul style="list-style-type: none"> • Updated January 19, 2017, a final report may not be ready by December 2017. Measures 1-4 and 6 must be vetted clearly before a final report can be created. An interim status update report on the measures and what is learned from the measures and any changes that are needed will be documented for 2017.

Notes or Action Items
<ul style="list-style-type: none"> • Some of the individual sufficiency guidelines could include development of a SAR for NERC Reliability Standard(s) or Reliability Guideline • Some measures in the sufficiency guideline may be incorporated into the annual NERC State of Reliability(SOR) and Long Term Reliability Assessment (LTRA) Reports for ongoing monitoring

Measure	M7 – Reactive Capability on the System
Existing Tasks	<p>ERSWG Tasks:</p> <ul style="list-style-type: none"> • The ERS will give the OC & PC recommendation as to whether to remove M7 and use the Reactive Power Guidelines. Q1 delivery of SAMS report on M7 will be used to make this decision. Recommendation to OC/PC could come as early as the June 2017 quarterly meeting.

M7 – Notes or Action Items
<ul style="list-style-type: none"> • Pending SAMS reports on Measure 7 • Ascertaining how to utilize/promote the Reactive Power Guideline proactively in the industry

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Measure	M1 – Interconnection Level Synchronous Inertial Response	M1 – Notes or Action Items
Existing Tasks	<p>NERC Tasks: (Presently BASS; Future PI Historian)</p> <ul style="list-style-type: none"> • Collect Interconnection inertia data: Date/Time, Total Interconnection inertia, Total MW load, Renewable MW (if known) <p>RS Tasks:</p> <ul style="list-style-type: none"> • Evaluate historic System Inertia (H) at the Interconnection Level • Analyze time trends in Interconnection inertia • Identify hours with lowest inertia at the Interconnection level 	<p><u>Action Item</u></p> <ul style="list-style-type: none"> • ERSWG Tasks : TBD
Required Data (Owner)	<ul style="list-style-type: none"> • Unit Data: Inertia Constant (H), MVA Rating, Status • Interconnection Data: MW Load, MW Generation, MW renewable 	<ul style="list-style-type: none"> • NERC-RRM collects Interconnection H data: Date/Time, Total Interconnection inertia, Total MW load, if known renewable MW
Reporting	Quarterly for RS and SAMS review	
Future Goals and Deliverables	<p>Develop M1 for future study period by trending inertia (H).</p> <ul style="list-style-type: none"> • Use the interconnection planning cases as a starting case and for inertia (H) studies. • H can be established for future year analysis periods. • Trend H for 3 previous years data using actual and projected unit retirements 	<p><u>Action Item</u></p> <ul style="list-style-type: none"> • NERC Tasks : Match the model to retirements with help of regions • David to ask RAS about bus numbers for missing generator data
Required Data	Planning Cases 3 Interconnections, LTRA data previous year (2016), Planning case bus numbers for generator units (RAS & NERC)	
Data Collection Owners	<ul style="list-style-type: none"> • Ask RAS to provide bus numbers for missing generator unit data 	<ul style="list-style-type: none"> • ERSWG to coordinate with David Calderon for RAS standing action items
Proposed Analysis Results	<ul style="list-style-type: none"> • Trending H, Actual 3 years & Projected H for future years • Sensitivity analysis with number of units replaced by natural gas how is H affected, inertia constant contributions from wind and solar units. 	<ul style="list-style-type: none"> • ERSWG to coordinate with NERC System Analysis for updates on analysis
Reporting	LTRA - (<u>To be discussed</u>)	

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Measure	M2 – Initial Frequency Deviation following single largest contingency (RoCoF)	M2 – Notes
Existing Tasks	NERC Tasks: <ul style="list-style-type: none"> • Calculate RoCoF for RLPC MW loss at lowest inertia (H) • Capture Historic RoCoF for M-4 frequency events (UTK Data) (Future) RS Tasks: <ul style="list-style-type: none"> • Capture Historic RoCoF for M-4 frequency events (UTK) • Analyze time trends 	<u>Action Item</u> <ul style="list-style-type: none"> • ERSWG Tasks : Assign SAMS to perform studies and assist with analysis
Required Data (Owner)	<ul style="list-style-type: none"> • UTK FNet Frequency data • Interconnection RLCPs from FRAA • FWG selected M-4 events (FWG) • M-4 event MW loss (FWG to RS) 	<ul style="list-style-type: none"> • NERC-RRM calculates RoCoF for RLPC MW loss at lowest inertia • NERC-RRM captures historic RoCoF for M-4 frequency events (UTK) (Future)
Reporting	Quarterly for RS and SAMS review	
Future Goals and Deliverables	The goal is to add inertia (H) to system or an offset to predict future H and future RoCoF events. <ul style="list-style-type: none"> • Use 3 years of trended RoCoF events data to move forward and to add this data to a toolset. 	<u>NERC-RASA Action Items</u> <ul style="list-style-type: none"> • Meet with Julia from ERCOT and discuss current approach for future RoCoF <ul style="list-style-type: none"> ○ completed January 18, 2017 • Meet with Terry & Raja from MISO and discuss current approach for future RoCoF <ul style="list-style-type: none"> ○ completed February 10, 2017
Required Data	Planning Cases 3 Interconnections	
Data Collection Owners	<ul style="list-style-type: none"> • Planning Cases 3 Interconnections build off of M4 future analysis (NERC) 	
Proposed Analysis Results	<ul style="list-style-type: none"> • unknown 	<ul style="list-style-type: none"> • ERSWG to coordinate with NERC System Analysis for updates on analysis
Reporting	LTRA - (<u>To be discussed</u>)	

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Measure	M3 – BA Synchronous Inertial Response
Existing Tasks	<p>NERC Tasks: (Presently BASS; Future PI Historian)</p> <ul style="list-style-type: none"> Collect Interconnection inertia data: Date/Time, Total Interconnection inertia, Total MW load, Renewable MW (if known) <p>RS Tasks:</p> <ul style="list-style-type: none"> Identify BAs that may have current or future issues with inertia (H) and/or balancing performance due to renewable penetration. For the identified BAs perform outreach and request inertia data and monitor the trends
Required Data (Owner)	<ul style="list-style-type: none"> Unit Inertia Constant (H), MVA Rating, Status (RS) Interconnection MW Load, MW Generation, MW renewable (RS)
Reporting	Quarterly for RS review
Future Goals and Deliverables	<p>Establish a way to do future looking studies on M3 so that periodic reporting can be performed on a future study period by trending inertia (H).</p> <ul style="list-style-type: none"> ERSWG identifies BAs with a great change in the generation resource mix, collects the data and determines the future steps for methods of analysis
Required Data	Identify BAs with future looking cases
Data Collection Owners	<ul style="list-style-type: none"> Data collection from BAs through ERSWG
Proposed Analysis Results	<ul style="list-style-type: none"> Alternatively, report H by area numbers (following M1 analysis) until BA data is collected by ERSWG
Reporting	LTRA - (<u>To be discussed</u>)

M3 – Notes or Action Items
<ul style="list-style-type: none"> For existing M3 concerns, a list for BA's with synchronous inertia issues will be created and further investigation steps will be developed. Only BA's with changes in the resource mix and problems that cannot be explained by the data alone will need further investigation
<ul style="list-style-type: none"> NERC-RRM collects Interconnection H data: Date/Time, Total Interconnection inertia, Total MW load, if known renewable MW
<p><u>ERSWG Action Items</u></p> <ul style="list-style-type: none"> Identify BAs with a great change in the generation resource mix then invite BAs with future looking cases to discuss their methods of analysis with the group. <p><u>NERC Action Items</u></p> <ul style="list-style-type: none"> NERC David to ask RAS about bus numbers for missing generator data ERSWG to coordinate with David Calderon for RAS standing action items ERSWG to coordinate with NERC System Analysis for updates on analysis

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Measure	M4 – Interconnection Level Frequency Response	M4 – Notes
Existing Tasks	RS Tasks: <ul style="list-style-type: none"> • Develop process document for selecting BAL-003 & M-4 frequency events • Analyze and monitor Interconnection performance & time trends • Expand analysis beyond current M-4 criteria used in SOR to include M4: C-to-B, C'-to-B , and C'-to-C Ratios, tc-to_o, tc'-to_o, and tc'-tc Measures 	<u>Action Item</u> <ul style="list-style-type: none"> • ERSWG Tasks : TBD
Required Data (Owner)	<ul style="list-style-type: none"> • UTK FNet Frequency data • FWG selected M-4 events (FWG) • M-4 event MW loss (FWG to RS) 	<ul style="list-style-type: none"> • NERC-RRM calculates RoCoF for RLPC MW loss at lowest inertia • NERC-RRM captures historic RoCoF for M-4 frequency events (UTK) (Future)
Reporting	Quarterly for RS and SAMS review and Annual for SOR Report	
Future Goals and Deliverables	Formulate high speed frequency response calculations and possible transfer function for forward looking M4 measure. <ul style="list-style-type: none"> • unknown 	<u>NERC- Action Items</u> <ul style="list-style-type: none"> • Developing a forward looking M4 measure using M1 cases
Required Data	<ul style="list-style-type: none"> • UTK FNet Frequency data • FWG selected M-4 events 	
Data Collection Owners	<ul style="list-style-type: none"> • unknown 	
Proposed Analysis Results	<ul style="list-style-type: none"> • Possibly use M1 future cases and evaluate system response to an individual interconnections' resource contingency criteria contingency 	<ul style="list-style-type: none"> • ERSWG to coordinate with NERC System Analysis for updates on analysis
Reporting	LTRA - (<u>To be discussed</u>)	

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Measure	M6 – BA Level Net Demand Ramping Variability (Ramping)
Existing Tasks	NERC Tasks: (currently done by EPG - Future PI Historian) <ul style="list-style-type: none"> • Calculate CPS1 at BA level RS Tasks: <ul style="list-style-type: none"> • Monitor 1 hour & 3 hour BA CPS1 performance and time trends • Identify and assist BAs that may have ramping issues as identified by performance data
Required Data (Owner)	<ul style="list-style-type: none"> • BA CPS1 hourly data (EPG) • BA hourly net variable demand ramping data (EPG)
Reporting	Quarterly for RS review
Future Goals and Deliverables	Ask BA's for forward looking ramp study methodology, look for BA's that consistently lean on other areas, summarize analysis in LTRA.
Required Data	<ul style="list-style-type: none"> • unknown
Data Collection Owners	<ul style="list-style-type: none"> • unknown
Proposed Analysis Results	<ul style="list-style-type: none"> • unknown
Reporting	LTRA - (<u>To be discussed</u>)

M6 – Notes
Monitor existing CPS1 performance at BA level <ul style="list-style-type: none"> • Evaluate the time trends (up/down/flat). • Other time intervals will be selected to be examined and new data points created for trending
<ul style="list-style-type: none"> • NERC-RRM and PAS to Calculate CPS1 at BA level (Future task, as it is currently done by EPG)
<p><u>NERC-RASA Action Items</u></p> <ul style="list-style-type: none"> • Discussions with EPRI • Coordinate with ERSWG to ask BA's for future looking ramping studies

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DER Subgroup - Recommended from DERTF Final Report		DER – Notes or Action Items
Existing Tasks	<p>A set of guidelines be developed to assist in modeling and assessments, such that owners/operators of the BPS can account for the impact of DER.</p> <ul style="list-style-type: none"> • Establish planning data requirements and a guideline to share information across the transmission-distribution (T-D) interface. This should be further evaluated to allow for adequate assessment of future DER deployments. 	
Required Data (Owner)	<ul style="list-style-type: none"> • unknown 	
Reporting	<ul style="list-style-type: none"> • unknown 	
Future Goals and Deliverables	<p>ERSWG to create a subgroup</p> <ul style="list-style-type: none"> • Possibly invite Transmission and Distribution Operators and Planners to join the sub-group • The subgroup is to develop a questionnaire to determine the needs of the (T-D) interface, collect the responses and then determine if supplemental guidelines (in reference to existing DER documentation) for BPS is required. • Establish guidance on the definition of DER for the purposes of collecting and analyzing consistent sets of data. 	
Required Data	<ul style="list-style-type: none"> • unknown 	
Data Collection Owners	<ul style="list-style-type: none"> • unknown 	
Proposed Analysis Results	<ul style="list-style-type: none"> • unknown 	
Reporting	<u>To be discussed</u>	

ERSWG & DERTF COMPLETED TASKS FOR 2016-2017

2016-2017 COMPLETED TASKS

Item	Task	Deliverables	Responsible Parties	Description/Length	Completion Deadline
Task 1	Technical Reference on Sufficiency Guidelines - Whitepaper	Develop a whitepaper on potential methods for quantifying sufficient amounts of essential reliability services	ERSWG & NERC Staff Review and endorsement by OC and PC NLT November 2016	<ul style="list-style-type: none"> • 10-15 page document 	Final Reviewed and endorsed by NERC Board by end of December 2016
Task 3	Distributed Energy Resources Task Force (DERTF) Report	Prepare a report on strategies and methods to maintain reliability while integrating DER resources	DERTF, ERSWG Leadership & NERC Staff	<ul style="list-style-type: none"> • Final Report 	Final Acceptance by NERC Board - December 2016