

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

NERC Planning Committee Work Plan

2019 – Q2

June 2019

RELIABILITY | ACCOUNTABILITY



3353 Peachtree Road NE
Suite 600, North Tower
Atlanta, GA 30326
404-446-2560 | www.nerc.com

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PC Meeting Schedule

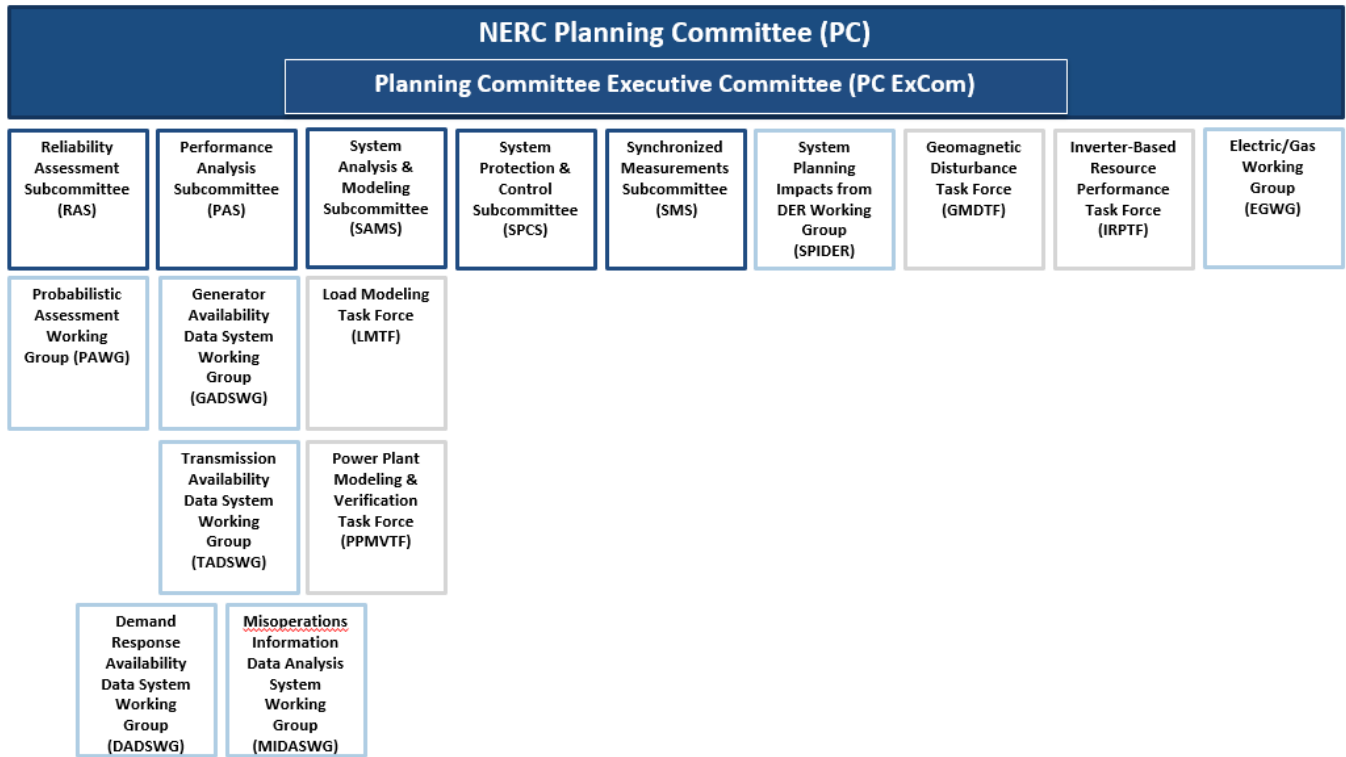
[NERC Calendar](#)

Meeting / Conference Call	Date / Time	Objectives / Goals
PC Executive Committee Web Meeting	January 28, 2019	Planning Session for March Meeting Agenda
PC Executive Committee Web Meeting	February 25, 2019	Work Plan Review
PC Meeting Pittsburgh, PA	March 5, 2019 1:00-5:00pm (LT) March 6, 2019 8:00am-12:00pm (LT)	
PC Executive Committee Web Meeting	March 25, 2019	Work Plan Review
PC Executive Committee Strategic Retreat Texas RE, Austin	April 16-17, 2019	PC Work Plan Detailed Review
PC Executive Committee Web Meeting	May 3, 2019	Planning Session for June Meeting Agenda
PC Meeting Orlando, FL	June 4, 2019 1:00-5:00pm LT June 5, 2019 8:00am-12:00pm LT	
PC Executive Committee Web Meeting	June 24, 2019	June PCEC meeting
PC Executive Committee Web Meeting	July 26, 2019	July PCEC meeting
PC Executive Committee Web Meeting	August 9, 2019	Planning Session for September Meeting Agenda
PC Meeting Location TBD	September 10, 2019 1:00-5:00pm LT September 11, 2019 8:00am-12:00pm LT	
PC Executive Committee Web Meeting	October 4, 2019	
PC Executive Committee Web Meeting	November 1, 2019	Planning Session for December Meeting Agenda
PC Meeting Atlanta, GA	December 10, 2019 1:00-5:00pm (LT) December 11, 2019 8:00am-12:00pm (LT)	

PC Subgroup Organization Chart



Planning Committee Subgroup Organizational Chart – January 2019*



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*Excludes inactive PC subgroups

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PC Subgroup Work Plan

Reliability Assessment Subcommittee (RAS)

Website: [RAS](#)

Hierarchy: Reports to PC

Chair: Tim Fryfogle (01/2018)

Vice-Chair: Lewis De La Rosa
(01/2018)

NERC Lead: Bill Lamanna

Scope Update: December 2016

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	2019 Summer Reliability Assessment	1, 2, 3	1, 2, 3, 4	2Q-2019	Endorse Link to Schedule	Endorsed by PC on May 29. Released June 4.
2	2019 Long-Term Reliability Assessment	1, 2, 3	1, 2, 3, 4	4Q-2019	Endorse Link to Schedule	On track. Data collection in progress
3	2019-20 Winter Reliability Assessment	1, 2, 3	1, 2, 3, 4	4Q-2019	Endorse	Draft schedule developed. Detailed planning begins Q2.
5	Review and provide input to NERC Staff (Advanced System Analytics and Modeling) on NERC Study of Resource Adequacy and Transmission Deliverability	1,3	1, 2, 3	Q4 2019	Information	NERC Staff is studying this issue and working with RAS for industry technical input. RAS and PAWG have provided feedback to NERC on study scope. Opportunities to provide input to NERC staff on analysis an results are anticipated as study progresses.

Probabilistic Assessment Working Group (PAWG)

Website: [PAWG](#)

Hierarchy: Reports to RAS

Chair: Josh Collins (1/2019)

Vice-Chair: Andreas Klaube (1/2019)

NERC Lead: JP Skeath

Scope Update: December 2016

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Data collection approaches and recommendations technical report Develop a technical report that describes industry approaches and best practices for probabilistic	2, 3	1, 2, 3	4Q-2019	Approve	Initial draft has been developed. On track for December 2019 PC Approval
2	Probabilistic Assessment Workshop Industry forum similar to events held in prior years. Provides opportunity for training, best practices, and information sharing.	3	1, 2, 3	Q4-2019	Information	Planning in progress for a December 2019 workshop
3	Consider developing a white paper on expanded Planning Reserve Margin scenario and assessment of non-peak hour risk	3	1, 2, 3	TBD	TBD	Task presented at the March PC Meeting;
4	Develop scope and schedule for 2020 probabilistic assessment.	3	1, 2, 3	Q4-2019	Information	Present to RAS for approval.

Performance Analysis Subcommittee (PAS)

Website: [PAS](#)

Hierarchy: Reports to PC

Chair: Maggie Peacock (09/2018)

Vice-Chair: Brantley Tillis (09/2018)

NERC Lead: Donna Pratt

Scope Update: December 2016

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Prepare the State of Reliability Report (SOR) based on the historic performance of the Bulk Power System.	3, 4	1, 5	Q2-2019	Endorse	Endorsed on June 11.
2	Annual review of metrics; SOR report improvements	3,4	1,5	Q4-2019	Information	Review in progress.
3	Update and review NERC Reliability Indicators webpage	3,4	1,5	Q4-2019	None	Ongoing

PC Subgroup Work Plan

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
4	Investigate Near-miss database options using data sources and processes already established to identify patterns and risks. <i>RISC Report Recommendation: The industry should develop a near-miss database to leverage data sources such as event analysis, Transmission Availability Data System (TADS), Generating Availability Data System (GADS), Demand Response Availability Data System (DADS), relay misoperations, EOP-004/OE-417 Reports, and AC equipment failures to identify patterns and risk.</i>	2018 RISC Report Profile 5	5	TBD	TBD	Continuing to work on what would qualify as 'Near-Miss'
5	Review and update the Bulk Power System Reliability Performance Metric report and processes.	3, 4	1, 5	Q3 2019	Approval	Review and update the 2009 BPS reliability performance metric report and process document to incorporate and document changes from the Reliability Metric Working Group to the Performance Analysis Subcommittee paradigm. Review and update is to document changes that have occurred since 2009.
6	Conduct detailed assessments that integrate analytic data trend insights regarding resilience under severe weather conditions, identifying preventable aspects for BPS reliability.	2018 RISC Profile 7	1, 2, 3	TBD	Information	Working to identify cause codes. Sub group formed for both PAS and RAS. PAS has obtained data and provides analysis in the 2019 SOR. RAS includes questions in the LTRA narrative request, and has updated seasonal assessments to better include weather-related risks.

Generating Availability Data System Working Group (GADSWG)

Website: [GADSWG](#)

Chair: Leeth DePriest (01/2018)

NERC Lead: Lee Thaubald

Hierarchy: Reports to PAS

Vice-Chair: Steve Wenke (01/ 2018)

Scope Update: December 2016

Redlines are proposed changes for review by the PC Executive Committee

#	Task Description	Risk Profile(s)	Strategic Focus Area	Target Completion	Requested PC Action	Status
1	Develop content for State of Reliability	3, 4	1, 5	Q2-2019	None	Complete
2	GADS Solar Data Reporting: Collect and analyze solar outage data <i>NERC RoP Section 1600 Data Request</i>	3, 4	1, 5	Q1-2020	Endorse	WG members with solar experience drafting the reporting instructions with the objective of preparing a section 1600 data request for NERC Board approval in 2020. (PC review of draft anticipated in Q1 2020.)
3	GADS Wind Data Reporting: Implement mandatory wind reporting	3, 4	1, 5	Ongoing	None	On-track; Phased-in mandatory reporting status began in 2018 and continues through 2020.
4	GADS Data	3,2	1,5	On-going	None	Identify additional data collection areas such as design data. Update existing cause codes and

PC Subgroup Work Plan

#	Task Description	Risk Profile(s)	Strategic Focus Area	Target Completion	Requested PC Action	Status
						prepare new cause codes for fuel issues and human performance issues as needed.
5	Enhance GADS database to provide more granular information on unit unavailability due to fuel assurance and energy security concerns	3,4	1,5	On-going	Information	GADSWG has developed a proposal to provide more granular information. Proposal being circulated amongst stakeholders for review.

Transmission Availability Data System Working Group (TADSWG)

Website: [TADSWG](#)

Chair: Dan King (6/2019)

NERC Lead: Jack Norris

Hierarchy: Reports to PAS

Vice-Chair: John Idzior (6/2019)

Scope Update: December 2016

#	Task Description	Risk Profiles(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Develop analysis for State of Reliability Report.	3, 4	1, 5	Q2-2019	None	Complete
2	Investigation of transmission-connected reactive devices (e.g., STATCOMS / SVCs) and their impact on the system; reviewing reactive device information to be collected; likely section 1600 data request.	3,4	1,5	Q4 2020	None	TADSWG working to develop the scope of data collection for reactive devices.
3	Review and consolidation of all TADSWG documentation	3	5	2019	None	Updated documentation plan in development.

Demand Response Availability Data System Working Group (DADSWG)

Website: [DADSWG](#)

Chair: TBD

NERC Lead: Donna Pratt

Hierarchy: Reports to PAS

Vice-Chair: TBD

Scope Update: June 2018

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Research availability of DADS data from other sources to see if there is continued unique reliability value in current collection method.	3, 4	1, 5	Q3 2019	None	Review in progress.

Misoperations Information Data Analysis System Working Group (MIDASWG)

Website: [MIDASWG](#)

Chair: Michael Bocovich (08/2018)

NERC Lead: Jack Norris

Hierarchy: Reports to PAS

Vice-Chair: Brian Kasmarzik (08/2018)

Scope Update: June 2018

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Develop analysis for State of Reliability Report.	3, 4	1, 5	Q2-2019	None	Complete
2	Develop Data Reporting Instructions for Misoperation data	4, 5	3, 6	Q3-2019	Information	DRI is ready to be posted. Will present to PCEC on June 24.
3	Review approved Section 1600 data request and, if appropriate, develop revisions in accordance with NERC Rules of Procedure	4, 5	3, 6	TBD	TBD	MIDASWG considering whether changes to Section 1600 may be necessary. Compiling content during DRI development. Effort will begin following completion of DRI.
4	Evaluate potential need to develop new or revised defined terms to support Misoperation data reporting	4, 5	3, 6	TBD	TBD	MIDASWG considering proposing new term(s) for NERC Glossary of Terms.

Electric - Gas Working Group (EGWG)

Website: [EGWG](#)

Chair: Michelle Thiry (01/2019)

NERC Lead: Thomas Coleman

Hierarchy: Reports to PC

Vice-Chair: Todd Snitchler (03/2019)

Scope Update: June 2019

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
	Development of Reliability Guideline in progress.					

System Analysis & Modeling Subcommittee (SAMS)

Website: [SAMS](#)

Chair: Hari Singh (06/2016)

NERC Lead: Jessica Harris

Hierarchy: Reports to PC

Vice-Chair: Evan Shuvo (06/2016)

Scope Update: December 2016

Redlines are proposed changes for review by the PC Executive Committee

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
<u>1</u>	Node-Breaker Planning Model Representation <i>Support advancement of node-breaker representation in planning models and alignment between planning and operations cases. Perform small scale pilot projects for future implementation of wide-scale construction of planning base case with full node breaker capability.</i>	<u>2, 3</u>	8, 9	Ongoing	None	Ongoing; multi-phase effort underway. SAMS is revising a proposal document previously approved by PC in Dec 2013. PCEC will be advised of results of review.

PC Subgroup Work Plan

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
<u>2</u>	Modeling Notifications <i>Developing Modeling Notifications, creating industry announcements and educational webinars on notifications</i>	<u>2, 3</u>	9	Ongoing	None	On-track; Ongoing: • Composite load model benchmarking • Usability testing for MOD-026 and MOD-027 • Frequency calculations in stability simulations • Generator capability data for modeling • Modeling notification on pitch controls for Type 1 and Type 2 WTG under review by SAMS and IRPTF • DER dispatch considerations (coordinate with SPIDERWG)
<u>2.a</u>	Modeling Notification Process Review			Q2 2019	Approve	Revised Modeling Notification Process Document Approved by PC June 2019
<u>3</u>	NERC Acceptable Models List <i>Maintain and document for industry list of 'approved models' for powerflow and dynamics; periodic updates to list based on industry advancements.</i>	<u>2, 3</u>	9	Ongoing	None	On-track; SAMS updated and approved the NERC Acceptable Models List at the November 2018 meeting.
<u>4</u>	Generator Protection Model Implementation and Benchmarking: Implement and benchmark GP3 I new dynamic model in all commercial planning software tools per PCPMTF recommendations	<u>2,3</u>	<u>8,9</u>	Q4-2019	None	On track; Specification document was completed and approved by SAMS August 2018, Letter to prioritize the implementation of the model was sent to software vendors
<u>5</u>	Technical Report: Case Creation Practices (MOD-032-1) for Interconnection-Wide Models <i>Review and assessment of practices (e.g., generation dispatch, demand response, firm transfers, demand levels) to identify areas for improvement or consistency.</i>	<u>2, 3</u>	<u>8,9</u>	Q1-2019 Survey Report completion Q4 2019	None	On track; forming assessment framework in SAMS. Survey in April-2019
<u>6</u>	Applicability of Transmission-Connected Reactive Power Resources Develop white paper with technical justification for recommended modifications to Applicability in relevant standards. Develop SAR based on white paper's recommendations.	<u>2, 3</u>	8,9	Q3-2019	Approve	SAR and white paper presented to PC in March 2019. PC reviewers performed review through April. SAMS is reviewing comments and considering revisions.
<u>7</u>	Conduct interconnection-wide technical studies such as Short-circuit analysis	2018 RISC Report, Profile 1	8	TBD	TBD	Remove from SAMS work plan. ERO-RAPA Steering Group will develop a study scope and inform/coordinate with PCEC to support this RISC Report Recommendation.
<u>8</u>	Clarify "Load Loss" terminology Prepare technical brief for diverse audience (regulators & industry executives) Task was assigned by PCEC following PC roundtable discussion/input from IOU sector representative at December 2017 PC meeting	2, 3	8	Q3-2019	None	SAMS awaiting further guidance from PC-EC per discussion at December 2018 PC-ExCom meeting to potentially seek input from the Operating Committee/ORS. White Paper in review with SAMS; NERC Staff OC and PC coordinators will facilitate ORS review.
<u>9</u>	Eastern Interconnection Frequency Response Analysis	2, 3	8	Q3-2019	None	PC updated at March 2019 meeting. PC reviewers assigned for review through April.

PC Subgroup Work Plan

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
	CRM-TSC & SAMS IBR Analysis subgroup formed to provide technical guidance to NERC staff. (August 2018)					
<u>10</u>	Review reliability guidelines developed by SAMS Task Forces prior to PC approval	n/a	n/a	ongoing	information	

Load Modeling Task Force (LMTF)

Website: [LMTF](#)

Chair: Dmitry Kosterev

NERC Lead: Olushola Lutalo

Hierarchy: Reports to SAMS

Vice-Chair:

Scope Update: December 2016

#	Task Description / Deliverables	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Load Model (Software) Benchmarking	2, 3	9	Ongoing	None	Phase 1 complete--all major software vendors benchmarked composite load model successfully; Additional work on track: beginning implementation and benchmarking of composite load model with DER component and single phase motors.
2	Robust (Default) Data Sets <i>Default datasets to support utilities seeking guidance on reasonable load model parameters (e.g., starting point or no other data available)</i>	2, 3	9	Q3-2019	None	On-track; LMTF will approve new default data set for Phase 2 (single phase motor stalling) parameters. Two data sets were posted, 3 rd data set with relaxed protection setting is under development
3	System Impact Assessment <i>Utility members sharing experience of load modeling and studies; user forum for sharing lessons learned.</i>	2, 3	8, 9	Ongoing	None	On-track; ongoing information sharing.
4	Dynamic Load Modeling in Real-Time Stability Analysis <i>Assessment of industry practices for use of dynamic load models for real-time or operations planning studies</i>	2, 3	8, 9	Q4-2020	None	Delayed due to higher priority topics; Survey released to LMTF members; follow-up and compilation is next step.
5	Progressive Protection System Modeling <i>Testing and studying progressive tripping, reconnection, and stalling modeling approach for improved model performance</i>	2, 3	9	Q4-2020	None	Require modular implementation first (task 10). longer-term goal; beta testing being performed by multiple software vendors.
6	Improved Single-Phase Motor Model	2, 3	9	Q4-2020	None	make model available to software developer for implementation (task 8 is a prerequisite)
7	Improved Three-Phase Motor Model	2, 3	9	Q4-2019	None	On-track, make model available to software developer for implementation (task 8 is a prerequisite)
8	Efficient Data Format & Model Management <i>New data format to modularize dynamic load models</i>	2, 3	9	Q1-2019	None	Beta testing being performed by multiple software vendors. PSLF and Powerworld already capable, PSS/E will need major version release (Version 35)
9	Modeling Notifications: Composite Load Model Benchmarking. Develop composite load model benchmarking notification to share with industry the completion and usability of the models across all major software platforms.	2, 3	9	Q2-2019	None	Estimate adjusted to Q2 2019.
10	Load Composition Analysis (e.g., Buildings, end uses)	2,3	9	On-going	None	On-track; ongoing information sharing.
11	Power Electronics Load, adjustable drive (VFD, ECM) electric vehicle charger models	2,3	9	On-going	None	On-track; ongoing information sharing.
12	Load Model Data Management Tool	2,3	9	On-going	None	On-track; ongoing information sharing.
13	Perform Periodic Scope Review Review approved scope and revise as needed. Provide revised scope to PCEC via SAMS for approval.	PC Charter	PC Charter	Q4 2020	Approval	Not started.

Power Plant Modeling & Verification Task Force (PPMVTF)

Website: [PPMVTF](#)

Chair: Shawn Patterson

NERC Lead: Ryan Quint

Hierarchy: Reports to SAMS

Vice-Chair:

Scope Update: May 2016

Redlines are proposed changes for review by the PC Executive Committee

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Power Plant Model Review <i>Review NERC acceptable list of models for power plants, provide guidance to development of list</i>	2, 3, 4	8,9	Ongoing	No	Ongoing
2	Reliability Guideline: MOD-032-1 Generator Data Requests <i>Develop technical guidance material for MOD-032-1 data requests and sharing; in response to NAGF letter seeking guidance</i>	2,3	8,9	Q3 2019	Approve	On track; target date changed to Q3.
3	White Paper: Plant Dynamics of Loss of Gas Pressure	2,3	8,9	Q1 2019	No	Complete
4	Reliability Guideline: Turbine-Governor Modeling Application <i>Develop technical guidance for applying turbine-governor models in interconnection-wide planning studies to improve the fidelity of these models for reliability studies.</i>	2,3	8,9	Q2 2019	Approve	Going to PC in March 2019 for industry comment.
5	White Paper: Generator Reactive Capability – Testing, Data, and Coordination <i>A white paper to address the activities relating to MOD-025-2, PRC-019-2, and MOD-032-1 related to testing, coordination, and modeling generator capability; a review of the applicable standards and the effectiveness of those standards in achieving the expected reliability outcomes.</i>	2, 3	4, 9	Q4 2019	Approve	New task based on PPMVTF discussions at January 2019 meeting. SAMS will consider the need for a SAR following completion of the white paper.
6	Modeling Notification: Frequency Calculations in Stability Studies	1, 2, 3	9	Q3 2019	Information	Proposed New task based on PPMVTF discussions at January 2019 meeting.
7	Modeling Notification: Usability Testing for MOD-026-1 and MOD-027-1	1, 2, 3	9	Q3 2019	Information	Proposed New task based on PPMVTF discussions at January 2019 meeting.
8	Modeling Notification: Generator Capability Data in Stability Studies	1, 2, 3	9	Q3 2019	Information	Proposed New task based on PPMVTF discussions at January 2019 meeting.
9	Modeling Notification: Generator Composite Capability Curve Modeling for Powerflow Studies	1, 2, 3	9	Q3 2019	Information	Proposed New task based on PPMVTF discussions at January 2019 meeting.
10	White Paper: Auxiliary Voltage Levels during Fault Events	1, 2, 3	8	Q3 2019	Approve	Proposed New task based on PPMVTF discussions at January 2019 meeting.
11	Perform Periodic Scope Review Review approved scope and revise as needed. Provide revised scope to PCEC via SAMS for approval.	PC Charter	PC Charter	Q4 2020	Approval	Not started.

System Protection & Control Subcommittee (SPCS)

Website: [SPCS](#)

Chair: Mark Gutzmann (11/2017)

NERC Lead: Andrew Slone

Hierarchy: Reports to PC

Vice-Chair: Jeff Iler (01/2018)

Scope Update: June, 2017

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	PRC-019 Implementation Guidance	2, 3, 4	8	Q3-2019	Endorse	Draft in development; completing review by NERC compliance staff. Anticipate

PC Subgroup Work Plan

						requesting PC reviewers at September PC meeting.
2	Standards Authorization Request (SAR): PRC-023-4 – Transmission Relay Loadability	1, 2, 4	2, 4	Q3-2019	Endorse	Reviewers assigned at December 2018 PC Meeting. SPCS is reviewing comments and preparing a proposed SAR for PC approval.
3	SAR and white paper: PRC-019-2 – Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection.	1, 2, 4	2, 4	Q2-2019	Endorse	PC Member review in progress through April 2019.

Synchronized Measurements Subcommittee (SMS)

Website: [SMS](#)

Chair: Aftab Alam

NERC Lead: Ryan Quint

Hierarchy: Reports to PC

Vice-Chair: Tim Fritch

Scope Update: March 2019

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	White Paper: Inverter-Based Resource Monitoring Task added based on discussions in NERC SMS, and in coordination with NERC IRPTF members.	2, 3, 4	8, 9	Q2 2019	Endorse	PC reviewers completed review in Feb 2019. SMS is addressing comments and revising the white paper.
2	Develop guidance for entities to use in considering applicability of CIP Standards Requirements to Synchrophasor System.	2,3,4	8,9	TBD	TBD	Planning in progress to develop a short implementation guidance.
3	Analyze information from the January 11, 2019 oscillation event. <i>Provide Informational updates to the PC and other technical groups of results of analysis and, if applicable, recommendations for industry consideration</i>					

System Planning Impacts of Distributed Energy Resources Working Group (SPIDERWG)

Website: [SPIDERWG](#)

Chair: Jeff Billinton (July 2018)

NERC Lead: Ryan Quint, JP Skeath

Hierarchy: Reports to PC

Vice-Chair: Bill Quaintance (July 2018)

Scope Approved: December 2018

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
Modeling Subgroup (Co-Leads: Irina Green, CAISO; Mohab Elnashar, IESO)						
M1	DER Modeling Survey <i>Perform industry survey of SPIDERWG members regarding use of DER planning models in BPS studies, dynamic load models, and DER modeling guidelines.</i>	1, 2	2, 3	Q3-2019	No	Still in early stages of developing survey, coordinating amongst other sub-groups; planning to survey internal SPIDERWG members. PCEC to be informed of survey results

PC Subgroup Work Plan

M2	<p>Reliability Guideline: DER Data Collection for Modeling <i>Guideline providing recommendations and industry practices for the mandatory and optional DER data to be collected by the Reliability Coordinator as well as on how, where, and when to gather such data.</i></p> <ul style="list-style-type: none"> Review the documentation of existing data collection techniques and processes that has been developed by the industry. Recommendations for DER data collection technique suitable for various study types. Recommendations for the DER data complexity requirements based on DER penetration levels 	1, 2	2, 3	Q4-2019	Yes	<p>Still in early stages of developing survey.</p> <p>PCEC Comment: Address applicable entity (PC/TP?); coordination needs with OC/ORS.</p> <p><i>(High priority task for SPIDERWG)</i></p>
M3	<p>Reliability Guideline: DER_A Model Parameterization <i>Guideline providing recommendation for DER modeling practices.</i></p> <ul style="list-style-type: none"> Review the documentation of existing study approaches related to modeling aggregate DER for the purposes of BPS planning. Recommendation on the level of details of DER models that are suitable for the studies being performed (e.g., steady-state analysis, stability analysis, short circuit analysis, etc.) Recommendation for developing and applying the new DER_A dynamic model including how to parameterize the model and default data sets that can be used as starting points. Coordinate with the Validation Sub-group on the validation of the aggregate DER models across software platforms for consistency. Develop default generic parameters of the DER for the purposes of BPS planning Considerations for energy storage modeling at the distribution level Recommendations on voltage and frequency ride through settings to represent performance in legacy and modern DERs. Develop methodology on how to aggregate DERs with different performance characteristics 	1, 2	2, 3	Q3-2019	Yes	<p>PC Authorized posting for industry comment at June Meeting.</p> <p><i>(High priority task for SPIDERWG)</i></p>
M4	<p>Review of MOD-032-1 for DER Data Collection <i>(In coordination with activity C4) Proposing MOD-032-1 SAR to address modifications to the standard to facilitate data collection for DERs for interconnection-wide modeling.</i></p>	1, 2	2, 3, 4	Q2-2019	Yes	<p>PC Reviewers assigned at June PC meeting.</p>
M5	<p>Modeling Notification: Dispatching DER off Pmax in Case Creation <i>Modeling notification on recommended practices and considerations for DER modeling when dispatching DER at output levels other than Pmax in the powerflow and dynamics data. Practices to ensure expected response from DER in these modeled conditions.</i></p>	1, 2	2, 3	Q3-2019	Information	<p>On track; moved to Q3. SAMS approves modeling notifications per current process.</p>
<p>Verification Subgroup (Co-Leads: Michael Lombardi, NPCC; Mike Tabrizi, DNV-GL)</p>						

PC Subgroup Work Plan

	<p>Reliability Guideline: DER Performance and Model Verification</p> <p><i>Reliability Guideline covering the following topics:</i></p> <ul style="list-style-type: none"> • Recommendations and industry practices for placement of recording devices, acceptable types of recording devices, measurement requirements, and how to use data for performance and model verification • Recommended practices for tracking aggregate DER performance during large BPS disturbances. • Recommendations for leveraging individual DER performance testing to develop aggregate level modeling, and how to perform model verification for aggregate DER performance. • Guidance on how to perform model benchmarking, and when this is needed; benchmarking study results against different software platforms (e.g., positive sequence RMS simulations against more detailed three-phase distribution feeder modeling), and how this can be applied for model verification. • Recommended approaches for localized model verification of individual feeders. • Recommended approaches for accounting for DER in both steady state powerflow and dynamic model verification for system-wide model validation (i.e., MOD-033-1); consideration for DER in model conversion between real-time EMS model and planning model. • Considerations of the ways to aggregate DER data depending on the types of studies being performed. 	1, 2	2, 3	Q4-2019	Yes	<p>On track – draft guideline in development.</p> <p><i>(High priority task for SPIDERWG)</i></p>
V2	<p>Reliability Guideline: DER Forecasting Practices and Relationship to DER Modeling for Reliability Studies</p> <p><i>Guidance providing how forecasting practices are linked to DER modeling for reliability studies. DER forecasting practices are important for accurately representing the correct amount and type of DER, particularly at an aggregate level representation for BPS studies.</i></p>	1, 2	2, 3	Q4-2020	Yes	<p>Tabled; refocus priority on V1 activity. Possible re-allocation to Studies (and possibly Coordination) Sub-Groups</p>

PC Subgroup Work Plan

Studies Subgroup (Co-Leads: Peng Wang, IESO; Jameson Thornton, PGE)						
S1	<p>Reliability Guideline: Bulk Power System Planning under Increasing Penetration of Distributed Energy Resources</p> <p><i>Guideline providing recommendations and industry practices for performing planning studies considering the impacts of aggregate DER behavior.</i></p> <ul style="list-style-type: none"> • Review and documentation of existing study approaches currently used by industry, development of findings and recommendations from these studies incorporating DER. • Review and highlight of DER study practices and known DER impacts from various entities around the world. • Guidelines on how to incorporate and represent DER in planning studies for potential reliability issues, such as selection of study scenarios with system gen/load conditions, and different approaches to incorporate DER in different types of studies. • Guidelines on study assumptions and approaches considering single-phase installation of DER; consideration of co-simulation tools and techniques. • Guidelines on types of reliability issues encountered with high DER penetration and potential solutions to these issues. • Recommended practices and approaches for reporting gross load, net load, and DER tripping/reconnection as part of simulation results. 	1, 2	2, 3	Q2-2020	Yes	<p>On track – draft guideline in development</p> <p><i>(High priority task for SPIDERWG)</i></p>
S2	<p>Review of TPL-001 Standard for Incorporation of DER</p> <p><i>White paper discussing technical review of NERC TPL-001-5, and development of any recommendations pertaining to consideration and study of DER impacts to the BPS.</i></p>	1, 2	2, 3, 4	Q4-2019	Yes	<p>On track – initial overview complete; considering more detailed language of standard currently.</p> <p><i>(High priority task for SPIDERWG)</i></p>
S3	<p>Recommended Simulation Improvements and Techniques</p> <p><i>Guidance (white paper) to software vendors on tools enhancements for improved accounting and study of aggregate DER.</i></p>	1, 2	2, 3	Q2-2020	Yes	<p>Moved back – needs input from S1 and S4; team collecting materials for future software changes.</p>
S4a	<p>Reliability Guideline: Recommended Approaches for Developing Underfrequency Load Shedding Programs with Increasing DER Penetration</p> <p><i>Guidance on how to study UFLS programs and ensure their effectiveness with increasing penetration of DER represented.</i></p>	1, 2	2, 3	Q4-2019	Yes	<p>Split into two guideline related to specific frequency or voltage subject.</p> <p>PCEC Comment: Consider making this deliverable Implementation Guidance</p>

PC Subgroup Work Plan

S4b	Reliability Guideline: Recommended Approaches for Developing Undervoltage Load Shedding Programs with Increasing DER Penetration <i>Guidance on how to study UVLS programs and ensure their effectiveness with increasing penetration of DER represented.</i>	1, 2	2, 3	Q4-2019	Yes	Split into two guideline related to specific frequency or voltage subject. PCEC Comment: Consider making this deliverable Implementation Guidance
S5	White Paper: Beyond Positive Sequence RMS Simulations for High DER Penetration Conditions <i>Considerations for high penetration DER systems and the need for more advanced tools (e.g., co-simulation tools) for studying DER impacts on the BPS.</i>	1, 2	2, 3	Q1-2020	Yes	
Coordination Subgroup (Co-Leads: Taylor Woodruff, Oncor; Kun Zhu, MISO)						
C1	Review of IEEE Std. 1547-2018 for impacts to BPS <i>White Paper of technical review of IEEE Std. 1547-2018 and development of any guidance on determination and effective use of performance requirements and settings within IEEE St. 1547-2018.</i>	1, 2	2, 3	Q3-2019	Yes	On track – coordinating with IEEE 1547 leadership. <i>(High priority task for SPIDERWG)</i> PCEC Comment: Provide reliability objective for this task
C2	Reliability Guideline: Communication and Coordination Strategies for Transmission Entities and Distribution Entities regarding Distributed Energy Resources <i>Develop recommended strategies to encourage coordination between Transmission and Distribution entities on issues related to DER such as information sharing, performance requirements, DER settings, etc.</i>	1, 2	2, 3	Q4-2019	Yes	In early stages of development; scoping activities for relatively short/focused guideline in the works; considering breaking into near- and long-term guidance.
C3	Educational Material to Support Information Sharing between Industry Stakeholders <i>Develop material to educate industry stakeholders on practices, recommendations, and technical work developed by other industry organizations.</i>	1, 2	2, 3	Q3-2020	No	Pushed out towards end of SPIDERWG activities; ongoing work in other groups needed first.
C4	Review of MOD-032-1 for DER Data Collection <i>see M4 activity.</i>	1, 2	2, 3, 4	Q2-2019	Yes	On track
C5	Coordination of Terminology <i>Review of existing definitions and terminology and development and coordination of new terms, for consistent reference across sub-groups.</i>	1, 2	2, 3	Ongoing	No	Tracking use of terminology within SPIDERWG discussions.
C6	NERC Reliability Standards Review <i>White Paper discussing EPRI report and prior NERC documentation regarding possible Reliability Standards modifications; work with NERC Staff to develop any prioritization of possible standards modifications.</i>	1, 2	2, 3, 4	Q3-2019	Yes	Awaiting EPRI report. Will consider IRPTF review to ensure no duplication <i>(High priority task for SPIDERWG)</i>
C7	Tracking and Reporting DER Growth <i>Coordinated review of information regarding DER growth, including types of DER, size of DER, etc. Consideration for useful tracking techniques for modeling and reliability studies.</i>	1, 2	2, 3	Ongoing	No	In monitoring and data collection stage.

Geomagnetic Disturbance Task Force (GMDTF)

Website: [GMDTF](#)

Chair: Emanuel Bernabeu (12/2017)

NERC Lead: Mark Olson

Hierarchy: Reports to PC

Vice-Chair: Ian Grant (12/2017)

Scope Update: December 2016

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Final Report on NERC GMD Research Work Plan tasks; Upon completion of research deliverables, the task force will review, comment, and provide an assessment of the research results and outcome <i>Assessment Reports</i> . Plan includes topics listed below (1a – 1h)	3, 7	2, 8	Q1-2020	Information	FERC accepted NERC's GMD Research Work Plan in FERC Order No. 851. EPRI project addresses all GMD Research Work Plan objectives. EPRI report publications are listed below (1a-1h). Final reports for all tasks are on track to be completed in Q4 2019.
1a	Task 1: Benchmark GMD Event analysis. <i>The research activities under this task consist of performing further research and analysis on the use of spatial averaging in defining benchmark GMD events that entities use when conducting the GMD Vulnerability Assessments required by the TPL-007 standard.</i>	3, 7	2, 8	Q1-2020	Information	Technical report summarizing database of extreme GMD events in development for Q2 2019. Final report of benchmark event analysis and spatial averaging in development for Q4 2019.
1b	Task 2: Latitude scaling analysis. <i>The research activities under this task include evaluating the latitude scaling factors in Reliability Standard TPL-007, including using existing models and developing new models to extrapolate, from historical data, the potential scaling of a 1-in-100 year GMD event on lower geomagnetic latitudes.</i>	3, 7	2, 8	Q1-2020	Information	Technical report in development for Q1 2020.
1c	Task 3: Improve Earth Conductivity Models. <i>The research activities under this task consist of activities to improve the accuracy of existing earth conductivity models for GIC studies.</i>	3, 7	2, 8	Q1-2020	Information	EPRI Report published January 2019: Use of Magnetotelluric Measurement Data to Validate/Improve Existing Earth Conductivity Models Product ID# 3002014856 Additional technical reports on validation of GIC models and non-uniform geoelectric field modeling are in development for Q1 2020.
1d	Task 4: Study Geoelectric Field Orientation for Transformer Thermal Impact Assessment. <i>This task will develop an approach for applying the benchmark geoelectric field time series to individual transformers in thermal impact assessments. The research activities under this task will consist of: 1) evaluating the existing approach used to perform transformer thermal assessments; and 2) developing alternative methods of applying the benchmark geoelectric field time series to individual transformers to represent worst-case hot-spot heating conditions in transformer thermal impact assessments.</i>	3, 7	2, 8	Q1-2020	Information	Technical report in development for Q1 2020.
1e	Task 5: Analyze 75 A per Phase Criterion Used In Transformer Thermal Assessment. <i>Research for this task will analyze the 75A/phase TPL-007 criterion used for transformer thermal impact assessments. The work will:</i>	3, 7	2, 8	Q1-2020	Information	Technical report in development for Q1 2020.

PC Subgroup Work Plan

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
	<ul style="list-style-type: none"> re-examine the screening criteria and if needed, an alternative criterion will be developed; and study tertiary winding harmonic heating and determine if this affects the thermal screening criteria. 					
1f	Task 6: Support NERC Section 1600 Data Request <i>The activities under this task consist of developing the necessary guidance, technical guidelines, and solutions to support a request for data or information under Section 1600 of the NERC Rules of Procedure for the collection of existing and new GIC data and magnetometer data. The purpose of this data collection is to respond to FERC's Order No. 830 directive to collect GMD monitoring data and to make that data publically available.</i>	3, 7	2, 8	Q1-2020	Information	EPRI Support ongoing. Data Reporting Program is addressed in task 2.
1g	Task 7: Calculate Ground Model Scaling Factors (Beta-factors). <i>The activities under this task are focused on calculating earth conductivity scaling factors (beta factors) as necessary to meet the needs of the industry. This includes the following: benchmark of electric field estimation results against available scientific and industry algorithms; production of beta factor averages over improved 1D regions; and determination of beta factor ranges from differences in magnetic field orientation, spectral content, and 3D contributions.</i>	3, 7	2, 8	Q1-2020	Information	EPRI Report Published January 2019: Tool Evaluation and Electric Field Estimate Benchmarking Results Product ID# 3002014853 Report with calculated Beta factors expected Q1 2020.
1h	Task 8: Improve Harmonics Analysis Capability. <i>The activities under this task consist of developing harmonics analysis guidelines and tools for entities to use in performing system-wide assessment of GMD-related harmonics.</i>	3, 7	2, 8	Q1-2020	Information	EPRI released beta-version of a software application for wide-area GMD-related harmonics analysis in January 2019. Open source tool will be released in Q1 2020.
1i	Task 9: Harmonic Impact Studies. <i>The activities under this task support understanding the impacts of vibrations due to GMD-related harmonics on power system equipment. The impacts of transformer heating are covered in detail in Task 4 and Task 5 of the Work Plan. The activities under this task will provide insight into the magnitudes of vibrations in power transformer tanks caused by GIC and assess the impact of these vibrations on the health of the transformer. This task is in response to FERC's request to NERC to address the effects of harmonics on transformers.</i>	3, 7	2, 8	Q4-2019	Information	EPRI Report Published January 2019: Transformer Vibration Analysis Product ID# 3002014855 Generator technical report is being developed for Q4 2019.
2	Develop a Data Reporting Instruction for entities to collect and report GIC and magnetometer data as specified in the ROP Section 1600 Data Request	3, 7	2, 8	Q3-2019	Information	NERC Staff and GMDTF team began work on draft DRI in August following completion of NERC Board action on section 1600 data request. Solicit 3-5 PC members to participate in Review/Comment.
3	GIC Monitoring and Magnetometer Data Collection Assessment; recommend how NERC should assess and report on the degree to which industry is following Section 1600 Data Request and guidance for GIC monitoring. (Guidance for GIC monitoring was developed by the GMD Standards Drafting Team as part of revisions to TPL-007). (Ref P. 88) <i>Plan for reviewing GIC data</i>	3, 7	2, 8	Q2-2019 (process)	Information	Process will be included in the DRI.

PC Subgroup Work Plan

#	Task Description / Deliverable	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
4	<p>Assess industry needs for capabilities to perform GMD-related harmonics analysis to support implementation of TPL-007 and identify best practices.</p> <p><i>Software Tool in development; GMDTF also intends to develop technical guidance (Implementation Guidance/guideline)</i></p>	3, 7	2, 8	Q1-2020	Approve	GMDTF will evaluate the tool and other industry capabilities in 2019. GMDTF leadership considered input from GMDTF members and determine that industry will benefit from additional guidance on GMD-related harmonics analysis. GMDTF leadership intends to solicit GMDTF members to support development of implementation guidance.
5	Analyze data from GMD events collected under the GMD Data Request and other necessary information to further understand GIC effects on BES facilities. Summarize observations, including observations on GIC modeling.	2018 RISC Profile 7	2	Q4-2020	Information	Activity is from 2018 RISC Report. Requires implementation of the Sect 1600 data request.
6	<p>Develop guidance for industry use in performing supplemental GMD vulnerability assessments required by approved standard TPL-007-2 (i.e., the supplemental GMD event). The approved standard provides a brief description of some approaches. However more technical detail is needed. Furthermore, other approaches being considered by entities should be documented and vetted.</p> <p><i>Propose development of implementation guidance</i></p>	2018 RISC Profile 7	2, 3	Q2 2020	Endorsement	Task is proposed following discussions at January 2019 GMDTF meeting.
7	<p>Perform Periodic Scope Review</p> <p>Review approved scope and revise as needed.</p> <p>Provide revised scope to PCEC for approval.</p>	PC Charter	PC Charter	Q4 2020	Approval	Not started.

Inverter-Based Resource Performance Task Force (IRPTF)

Website: [IRPTE](#)

Chair: Al Schriver

NERC Lead: Ryan Quint; [Rich Bauer](#)

Hierarchy: Reports to PC and OC

Vice Chair: Jeff Billo

Scope Update: June 2017

Redlines are proposed changes for review by the PC Executive Committee. Scope review and revisions in progress.

#	Task Description	Risk Profile(s)	Strategic Focus Area(s)	Target Completion	Requested PC Action	Status
1	Technical Workshops on Inverter-Based Resources <i>Workshop to share key findings and best practices learned during the IRPTF efforts to-date.</i>	1, 2, 3	2, 3	Q1 2019	None	Complete. Workshop at CAISO Feb 12-13, 2019.
2	Modeling and Simulations Technical Report <i>Findings, recommendations, and experiences modeling and studying inverter-based resources; information from NERC Alert data collection; generation interconnection studies; IRPTF stability studies</i>	1, 2, 3	2, 3	Q3 2019	Approve	On track. Report in progress.
3	<i>Canyon 2 NERC Alert Follow Up – Modeling and Simulation Follow up work with entities to ensure accurate and appropriate models are being used for local and interconnection-wide studies and base case creation. Engagement with MOD-032 Designees, Planning Coordinators, Transmission Planners, and Generator Owners to ensure accurate modeling. Follow up with the proposed changes and execution of those changes.</i>	1, 2, 3	2, 3, 6	Q4 2019	None	Monitoring entities progress to address Canyon 2 Fire disturbance NERC Alert. Coordinating with WECC SMAG for activities in Western Interconnection. Coordination meeting between NERC, WECC, and Western entities on related topic.
4	<i>IEEE p2800 Monitoring and Support Monitor and support the activities of IEEE p2800, and provide technical expertise and input as requested.</i>	1, 2, 3	2, 3	Ongoing	None	Ongoing, as needed.
5	Reliability Guideline: Recommended Improvements to Interconnection Agreements for Inverter-Based Resources <i>Guidance following the IRPTF guideline on recommended performance of inverter-based resources, focusing on how to improve facility connection requirements to ensure reliable operation of the BPS.</i>	1, 2, 3	2, 3	Q3 2019	Approve	PC/OC authorized posting for comments at June 2019 meeting.
6	White Paper: Terminology for Fast Frequency Response and Low Inertia Systems – NERC IRPTF Perspectives <i>Short white paper to provide recommended terminology and definitions for discussing fast frequency response, low inertia systems, and other relevant concepts. In coordination with other NERC groups and CIGRE/IEEE activities.</i>	1, 2, 3	2, 3	Q4 2019	Approve	On track; initial activities underway.
7	White paper: Coordinated Review of NERC Reliability Standards, and Applicability and Clarity of Standards to Inverter-Based Resources <i>A cursory review and documentation of potential standards that could be improved or strengthened to add clarity and consistency for inverter-based resources.</i>	1, 2, 3	2, 3, 4	Q4 2019	Approve	On-track; review underway with IRPTF sub-group. Continuation of PRC-024-2 White Paper and SAR
8	Continuation of “Tabled Issues” <i>Discussion of IRPTF and NERC activities beyond those captured in the PRC-024-2 White Paper, as documented in the white paper. Discussion, analysis, and recommendations for continued improvements to inverter-based resource performance and NERC standards.</i>	1, 2, 3	2, 3	Q4 2019	Approve	Ongoing, review of tabled issues in coordination with other activities above. Continuation of PRC-024-2 White Paper and SAR
9	Review IRPTF Scope, discuss updates with OC and PC EC, and develop a revised scope for approval as appropriate.			Q3 2019	Approve	Revised scope developed and discussed with PC in June.

PC Subgroup Work Plan

						Anticipate providing for approval in September.
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