

South Carolina Regional Transmission Planning Stakeholder Meeting

Skype Meeting

March 16, 2018 10:00 – 11:00 AM

Purpose and Goals for Today's Meeting

- Identify Economic Power Transfer Sensitivities to be Studied
- Regional Planning Process
- Multi-Party Assessments and Studies
- EIPC Activities on Frequency Response

Economic Transmission Planning Power Transfer Sensitivities

Clay Young

Economic Transmission Planning Principles

The purpose of Order 890's Economic Transmission Planning Principle is to:

- ensure that customers may request studies that evaluate potential upgrades or other investments that could reduce congestion or integrate new resources and loads on an aggregated or regional basis
- allow customers, not the transmission provider, to identify those portions of the transmission system where they have encountered transmission problems due to congestion or whether they believe upgrades and other investments may be necessary to reduce congestion and to integrate new resources

Economic Transmission Planning Principles

(continued)

- allow customers to request that the transmission provider study enhancements that could reduce such congestion or integrate new resources on an aggregated or regional basis without having to submit a specific request for service

This approach ensures that the economic studies required under this principle are focused on customer needs and concerns

Economic Transmission Planning Sensitivity Selection

- All requested sensitivities will be considered except sensitivities that specify specific generation resources
- Up to 5 sensitivities will be identified for study
- If more than 5 are requested, Stakeholder voting members will vote to select the top five
- Sensitivities that are not selected by the voting process as one of the 5 studied sensitivities will be studied only if the requestor(s) pays for the additional study efforts

Economic Transmission Planning Sensitivity Selection

- SCRTP economic power transfer sensitivity studies will identify congestion and required improvements only inside the SCRTP footprint

Current Voting Stakeholder Group Members

- Cooperatives

John Boyt, Central Electric

Vacant

- Municipals

Alan Loveless, City of Georgetown

Vacant

- Network and PTP Transmission Customers

J. W. Smith, Southeastern Power Administration

Vacant

Current Voting Stakeholder Group Members

- Generation Owners / Developers
 - Tim Daniels, Hudson Energy Development LLC
 - Vacant
- Marketers
 - Eddie Folsom, SCE&G Power Marketing
 - Glenda Horne, Santee Cooper Power Marketing
- Transmission Owners
 - Bob Pierce, Duke Energy-Carolinas
 - Kerry Sibley, Georgia Transmission

Current Voting Stakeholder Group Members

- ISO / RTO
Vacant
Vacant

Economic Transmission Planning Power Transfer Sensitivities

Sensitivities Selection

Skyler Adams

Previous Economic Planning Studies

Year	Source	Sink	Study Year	Transfer
2014	Duke Energy Carolinas (DEC)	Santee Cooper	2015 Winter	250 MW
2014	Offshore Wind Injection (115 kV)	Santee Cooper/SCE&G	2019 Winter	300 MW
2014	Southern Company	SCE&G	2015 Summer	300 MW
2014	SCE&G	Duke	2019 Summer	200 MW
2015	Southern Company	SCE&G	2016 Winter	300 MW
2015	Southern Company	SCE&G	2018 Summer	300 MW
2015	Duke Energy Carolinas (DEC)	SCE&G	2018 Summer	200 MW
2015	Southern Company	SCE&G	2018 Winter	350 MW
2015	Duke Energy Carolinas (DEC)	SCE&G	2018 Winter	250 MW

Previous Economic Planning Studies

Year	Source	Sink	Study Year	Transfer
2016	Southern Company	Santee Cooper	2017 Winter	500 MW
2016	Santee Cooper	GTC	2017 Summer	200 MW
2016	Santee Cooper	GTC	2017 Winter	200 MW
2016	Santee Cooper	CPL (DEP)	2017 Winter	300 MW
2016	Southern Company	Santee Cooper/SCE&G	2020 Summer	500 MW
2017	Duke Energy Carolinas (DEC)	SCE&G	2021 Summer	300 MW
2017	Southern Company	SCE&G	2020 Summer	300 MW
2017	Southern Company	SCE&G	2021 Winter	300 MW

Transmission Planning Base Cases

2018 MMWG and SERC Series

2019 Spring Light Load

2019 Summer Peak

2019/20 Winter Peak

2022 Spring Light Load

2022 Summer Peak

2022 Summer Shoulder

2022/23 Winter Peak

2027 Summer Peak

2027/28 Winter Peak

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #1:	
Source Area:	Southern Company
Sink Area:	Santee Cooper
Transfer (MW):	1000 MW
Study Year:	2021
Study Conditions:	Summer
Other Information:	Load to Load
Benefits of Study and Other Comments:	Market Transfer Analysis Limitations

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #2:	
Source Area:	Santee Cooper
Sink Area:	Duke (which?)
Transfer (MW):	1000 MW
Study Year:	2021
Study Conditions:	Summer
Other Information:	Load to Load
Benefits of Study and Other Comments:	Market Transfer Analysis Limitations

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #3:	
Source Area:	Duke (which?)
Sink Area:	Santee Cooper
Transfer (MW):	1000 MW
Study Year:	2022
Study Conditions:	Summer
Other Information:	Load to Load
Benefits of Study and Other Comments:	Market Transfer Analysis Limitations

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #4:	
Source Area:	
Sink Area:	
Transfer (MW):	
Study Year:	
Study Conditions:	
Other Information:	
Benefits of Study and Other Comments:	

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #5:	
Source Area:	
Sink Area:	
Transfer (MW):	
Study Year:	
Study Conditions:	
Other Information:	
Benefits of Study and Other Comments:	

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #6:	
Source Area:	
Sink Area:	
Transfer (MW):	
Study Year:	
Study Conditions:	
Other Information:	
Benefits of Study and Other Comments:	

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #7:	
Source Area:	
Sink Area:	
Transfer (MW):	
Study Year:	
Study Conditions:	
Other Information:	
Benefits of Study and Other Comments:	

Economic Transmission Planning Sensitivity Selection

Economic Sensitivity #8:	
Source Area:	
Sink Area:	
Transfer (MW):	
Study Year:	
Study Conditions:	
Other Information:	
Benefits of Study and Other Comments:	

2018 Economic Planning Proposed Scenarios

#	Source	Sink	Amount (MW)	Year	Study Conditions	Requestor
1	Southern	Santee Cooper	1000	2021	Summer	SCPSA PM
2	Santee Cooper	Duke	1000	2021	Summer	SCPSA PM
3	Duke	Santee Cooper	1000	2022	Summer	SCPSA PM
4						
5						
6						
7						
8						

2017 Economic Planning Scenarios

Selected by Stakeholders During the March 16, 2018 Meeting

#		Source	Sink	Amount (MW)	Year	Study Conditions
1						
2						
3						
4						
5						

SCRTP Regional and Inter-regional Processes

Clay Young

SCRTP Regional and Public Policy Planning

- Biennial Process (currently in year 2, Meeting #6)
- Restarts in 4th quarter of even years
- Regional Projects – Proposed, Evaluation and Selection
 - **Must be submitted by January 15 of odd years**
 - None received in current Regional Planning cycle

During this meeting:

- SCE&G announces local solutions for Transmission Needs driven by Public Policy Requirements
- Qualified Developers may request cost allocation for projects that satisfy the Transmission Providers' Initial Screening Criteria

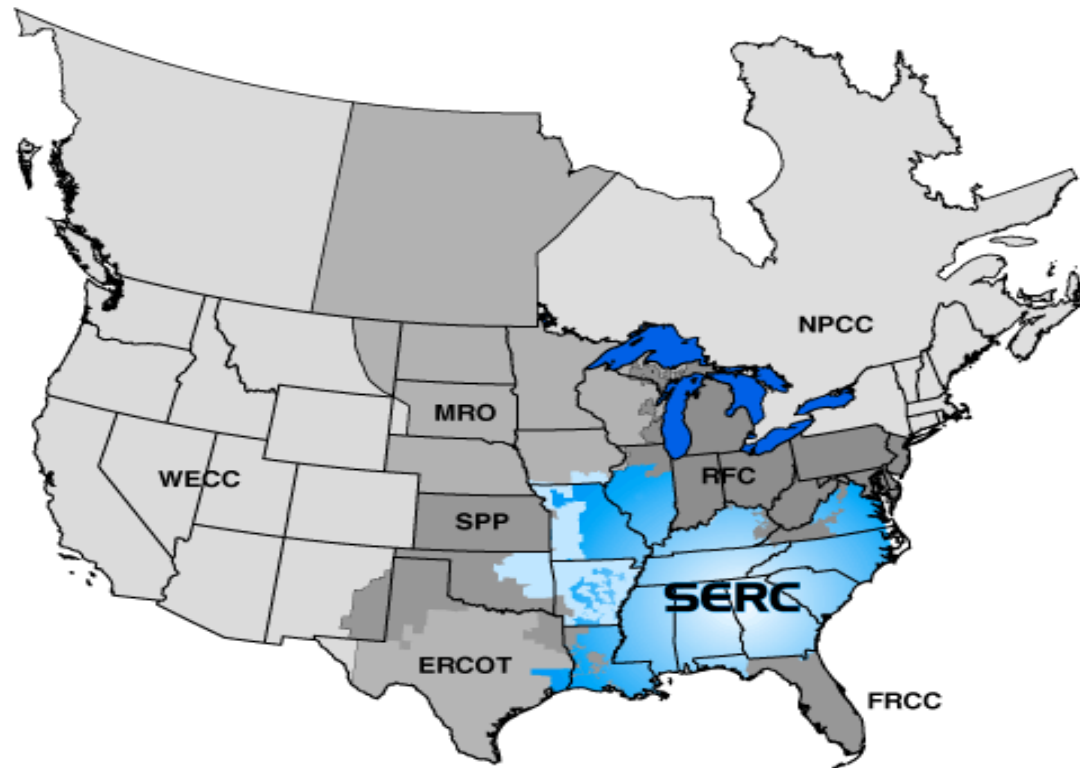
Reliability Assessment and Multi-Party Studies

Weijian Cong

Multi-Party Assessments

- **SERC Reliability Corporation Assessments**
- **Eastern Interconnection Reliability Assessment Group (ERAG)**
- **Carolina Transmission Coordination Arrangement (CTCA) Assessments**

SERC Future Year Assessments Long Term Study Group (LTSG)



SERC LTSG Study

Purpose

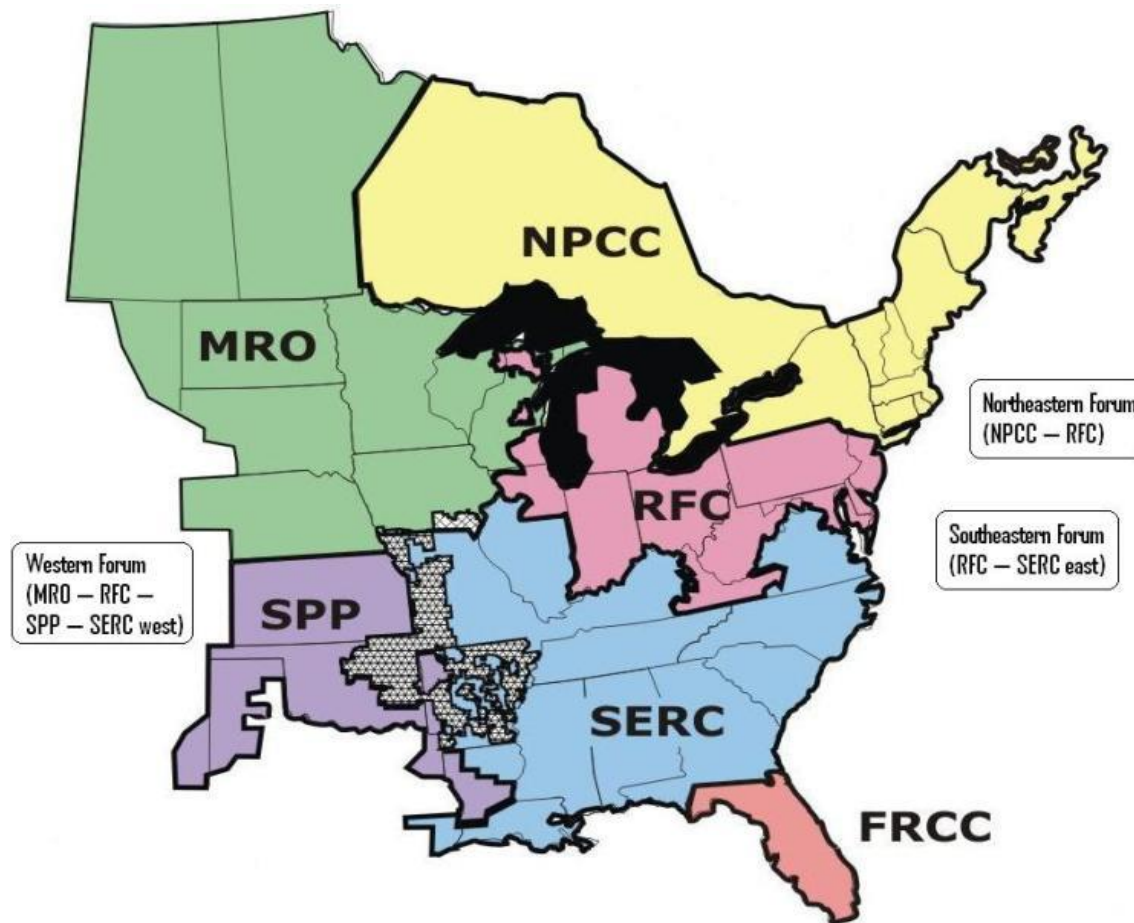
- Analyze the performance of the members' transmission systems and identify limits to power transfers occurring non-simultaneously among the SERC members.
- Evaluate the performance of bulk power supply facilities under both normal and contingency conditions for future years.
- Focus on the evaluation of sub-regional and company-to-company transfer capability.

SERC Long Term Study Group

2018 Work Schedule

- 2018 DBU kickoff began in January, 2018
- Power flow cases scheduled to be finalized on June 14, 2018
- Future Study Year Case: 2023 Summer Peak Load
- Study and report to be completed by LTSG June thru October
- Final Report to be approved in December, 2018

Eastern Interconnection Reliability Assessment Group (ERAG) Assessments



- ReliabilityFirst Corporation (RF)
- Midwest Reliability Organization (MRO)
- Florida Reliability Coordinating Council (FRCC)
- Northeast Power Coordinating Council (NPCC)
- Southeastern Electric Reliability Council (SERC)
- Southwest Power Pool Regional Entity (SPP RE)

ERAG MMWG

The Multiregional Modeling Working Group (MMWG) is responsible for developing a library of solved power flow models and associated dynamics simulation models of the Eastern Interconnection.

The models are for use by the Regions and their member systems in planning future performance and evaluating current operating conditions of the interconnected bulk electric systems.

ERAG MMWG 2018 activity

- MMWG power flow cases finalized October 2017
- Model update from August – September 2018

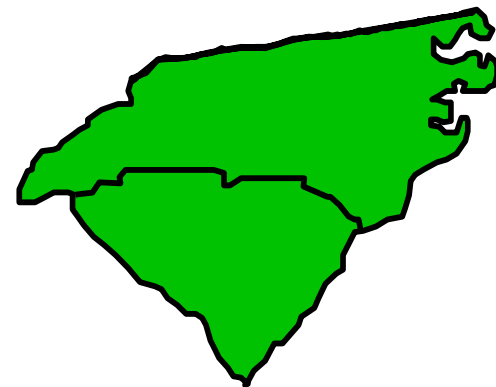
ERAG Assessments

- The purpose of the Eastern Interconnection Reliability Assessment Group (ERAG) is to further augment the reliability of the bulk-power system in the Eastern Interconnection through periodic studies of seasonal and longer-term forecasted transmission system conditions.
- No ERAG Long Term Study currently planned in 2018

CTCA Purpose

- Collection of agreements developed concurrently by the Principals, Planning Representatives, and Operating Representatives of multiple two-party Interchange Agreements
- Establishes a forum for coordinating certain transmission planning assessment and operating activities among the specific parties associated with the CTCA
- Participating entities:
 - Duke Energy Carolinas
 - Duke Energy Progress
 - South Carolina Electric & Gas
 - Santee Cooper

CTCA Future Year Assessments



- No CTCA Long Term Study currently planned in 2018
- 2018 NERC TPL-001 analysis study files coordination
 - Selected Power flow cases
 - Contingency files updated

Questions?

Eastern Interconnection Planning Collaborative Frequency Response Task Force

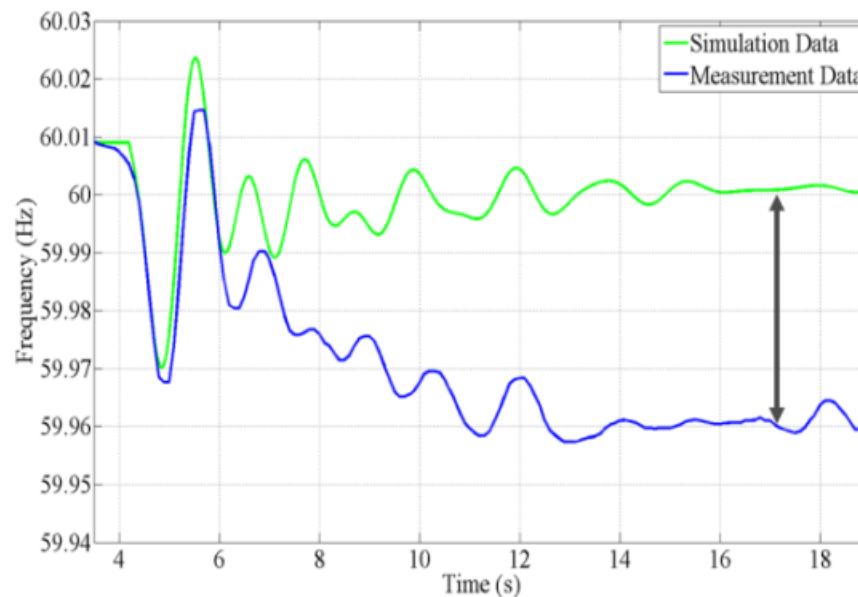
Phil Kleckley

SCRTP Regional Stakeholder Meeting

March 16, 2018

Frequency Response Issue

Eastern Interconnection frequency response simulations results not correlating closely with measurements



**Mismatch
between
frequency
response.**

Background and Purpose

Created July, 2017

Response to EI frequency challenging developments

- Change in generation resource mix
- Potential increase in UFLS events
- Need for improved frequency responsive simulation models

EIPC

Background and Purpose

- Generation sources need to provide frequency response to maintain synchronous and stable system operation
- Variable energy resources (VERs) do not provide frequency support comparable to high inertia fossil/nuclear sources
- Simulation of frequency response of VERs needs further development

Background and Purpose

In Support of NERC Essential Reliability Services Working Group

- ERSWG Measurement 1 – Determine Synchronous Inertial Response (SIR) of Eastern Interconnection
- ERSWG Measurement 2 – Determine initial frequency deviation of largest contingency during minimum SIR conditions
- ERSWG Measurement 4 – Determine frequency response of Eastern Interconnection beyond initial deviation

Background and Purpose

- Difficult to predict frequency response impacts of photovoltaic generation
- Approached by NERC Essential Reliability Services Working Group (ERSWG)
- Facilitate forward looking frequency response analysis

Tasks

- Build on work by University of Tennessee – Knoxville and Lawrence Berkeley National Laboratory
- Create base case(s) for future frequency response studies and identify data improvements
- Perform/commission frequency response simulation tests
- Provide results to NERC ESRWG, NERC MMWG, other interconnections for future base case improvements

Tasks

- Review current research on frequency response of Eastern Interconnection
- Calculate inertia of MMWG cases
- Select historical low inertia and frequency events
- Collect historical dispatch data associated with frequency events

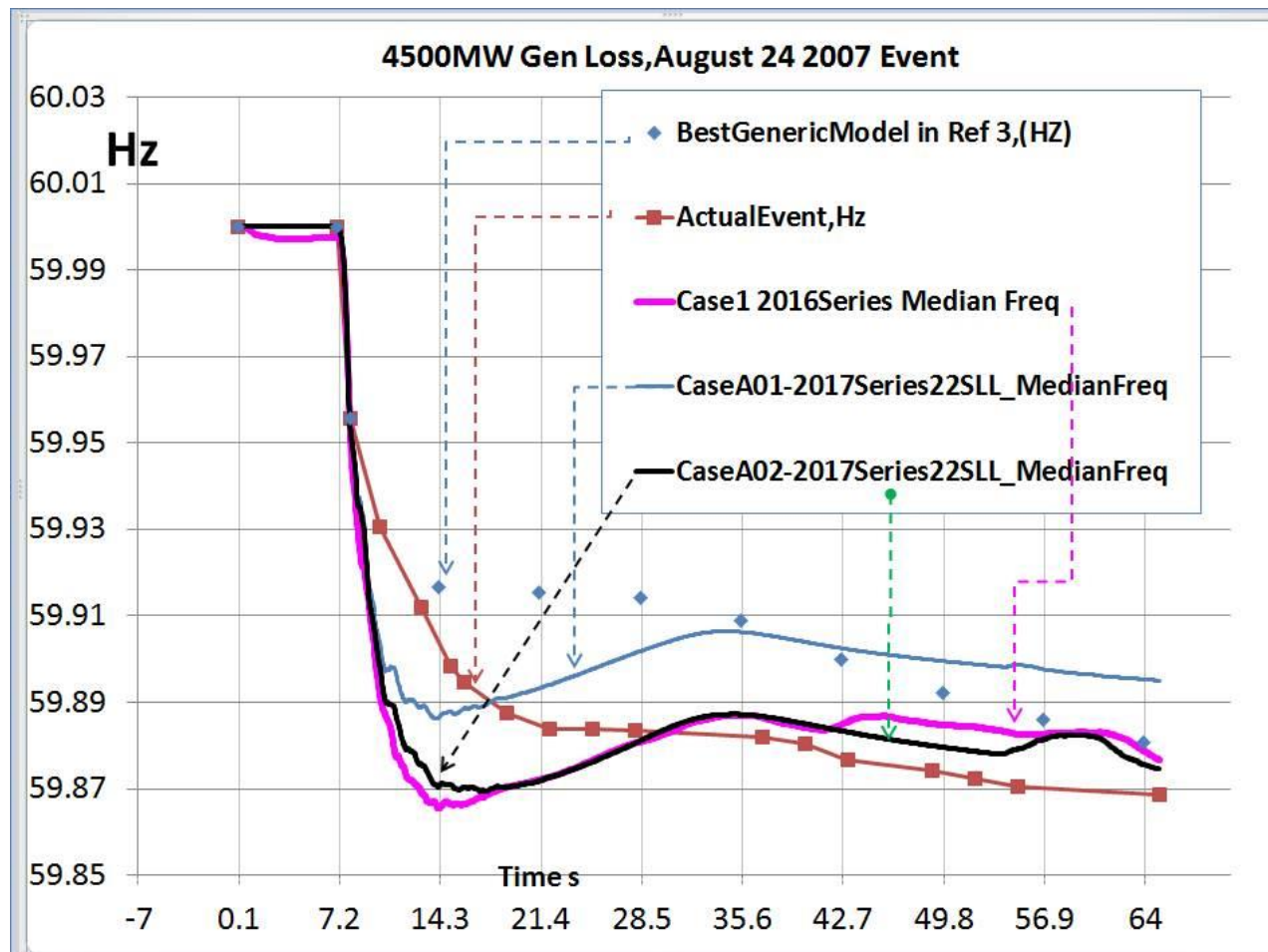
Tasks

- Perform/commission frequency response simulation tests
- Provide results to NERC ESRWG, NERC MMWG, other interconnections for future base case improvements

Tasks

- Compare historical dispatch with selected MMWG case
- Identify any gaps in MMWG frequency response models
- Identify potential improvements to model development practices
- Establish baseline confidence in solutions provided by currently available models
- Recommend improvements to models

Initial Comparison



Tasks

- Recommend model improvements
- Develop changes required to transform MMWG case into a low inertia dispatch with generator model modifications and create dynamics case
- Perform simulation of selected event(s)

Tasks

- Write project completion report and present results
- Outreach to other interconnections

Next Steps

- Utilize 2017 ERAG vintage model with frequency response improvements to simulate 5 year out significant event(s)
- Provide input to NERC Essential Reliability Services Working Group for model improvements
- Provide input to NERC Long term Reliability Assessment report

Completion

- Dynamics case and associated models are CEII – available to individuals approved through EIPC CEII process
- Projected project completion July 31, 2018

Questions?

Contact Phil Kleckley

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Next SCRTP Meeting

- Discuss initial study results (for Stakeholder input) of RTP studies (NERC TPL and internal criteria)
- Discuss any revisions to the Local Transmission Plan based on the RTP studies.
- Discuss major transmission projects focusing on the next 5 years
- Review and discuss Multi-Party Assessment Studies
- SCRTP Email Distribution List will be notified
- Register online

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