TAG Meeting
June 16, 2014

Webinar

TAG Meeting Agenda

1. Administrative Items – Rich Wodyka
2. FERC Order No. 1000 - Rule on Transmission Planning and Cost Allocation – Sam Waters
3. 2014 Study Activities – Mark Byrd
4. Joint Inter-regional Study Scope and Study Activities – Bob Pierce
5. Operations Reliability Coordination Agreement (ORCA) Report – Bob Pierce
6. Regional Studies Update – Bob Pierce
7. 2014 TAG Work Plan Update – Rich Wodyka
8. TAG Open Forum – Rich Wodyka

FERC Order No. 1000 Rule on Transmission Planning and Cost Allocation Compliance Update

Sam Waters – Duke Energy Carolinas

on behalf of the North Carolina Transmission Planning Collaborative

For the 6/16/14 TAG Meeting

NCTPC Regional Compliance Filings

- Oct 11, 2012 – DEC/DEP submitted regional compliance filing.
- Feb 21, 2013 – FERC issued order rejecting the NCTPC as an Order No. 1000 region.
- Mar 25, 2013 – DEC/DEP filed a request for rehearing/clarification of the order.
- Dec 19, 2013 – FERC issued order largely denying the DEC/DEP rehearing request. Order required some changes to the NCTPC local planning process. Duke given 60 days to submit revised compliance filing.

SERTP Filings

- May 22, 2013 – DEC/DEP submitted a revised Order No. 1000 regional compliance filing with FERC.
- July 10, 2013 – SERTP Sponsors submitted their interregional compliance filing – haven't received any FERC response.
- July 18, 2013 – FERC order on the SERTP regional compliance filing.

SERTP Filings (cont.)

- Aug 19, 2013 – SERTP Sponsors filed for rehearing of the July 18th order – haven't received any FERC response.
- Sept 30, 2013 – SERTP Sponsors filed with FERC the following:
  1. A request for an extension of time till January 14, 2014 to submit their revised regional compliance filing; and
  2. Requested an effective date of June 1, 2014 to implement the Order No. 1000 regional compliance.
- Oct 17, 2013 – FERC granted the above Sept 30th requests.

SERTP Filings (cont.)

- Jan 14, 2014 – DEC/DEP along with other SERTP Sponsors submitted the 2nd Regional Compliance Filing (for Duke – only filed the transmittal letter).
- Feb 10, 2014 – DEC/DEP submitted 2nd Regional Compliance Filing which included revised NCTPC local areas as well as SERTP regional compliance areas.

Implementation

- June 1, 2014 – Effective date for the Order No. 1000 NCTPC local process and the SERTP regional process began.

- ***June 27 – SERTP Stakeholder Meeting***
  - *Note: To sign up for this meeting go to http://www.southeasternrtp.com/contactus.asp and identify in the comments section that you would like to participate in the meeting either in person or by webinar.*

Transmission Planning Stakeholder Participation

- NCTPC – NCTPC will continue to function as the “local” transmission planning venue.

- SERTP – The regional planning process for Order No. 1000 purposes will be through the SERTP.
  - SERTP website link: http://www.southeasternrtp.com
  - Sign-up for SERTP email updates: http://www.southeasternrtp.com/email_signup.asp

FERC Order on SCE&G Order 1000 Filing

- On May 15th, FERC issued their second regional compliance order for the SCRTP region which also included a response to the rehearing requests.
- FERC granted rehearing on a couple of important issues related to state jurisdiction.
  - FERC previously ordered the provisions, such as state laws allowing for right of first refusal (ROFR), be removed from FERC tariffs and agreements. But after further consideration FERC concluded that ignoring these state laws at the outset of the regional transmission planning process could cause inefficiencies and delay new transmission projects.
  - This also extends to state laws related to right-of-ways.

FERC Order on SCE&G Order 1000 Filing

- FERC basically approved the following areas of compliance that are similar to the SERTP proposal:
  - Cost allocation – use of avoided transmission cost plus transmission losses
  - Withdrawal provisions – ability for non-FERC jurisdictional entities to withdraw from the SCRTP with a 60 day notice
- FERC required a number of compliance changes.
- SCE&G is to required to file their 3rd Regional Compliance filing within 60 days (July 14th).

Questions ?

NCTPC
2014 Study Activities

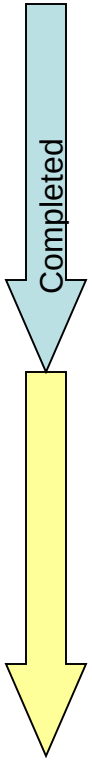
Mark Byrd

Duke Energy Progress

Studies for 2014

- **Annual Reliability Study**
  - **Assess DEC and DEP transmission systems' reliability and develop a single Collaborative Transmission Plan**
- **Enhanced Access Study**
  - **Thermal analysis of transferring 250 MW from TVA to CPLW**
- **Special Request from NCUC**
  - **Assess potential impact of external transfers on the transmission grid in North Carolina**

Steps and Status of the Study Process



1. Assumptions Selected
2. Study Criteria Established
3. Study Methodologies Selected
4. Models and Cases Developed
5. Technical Analysis Performed
6. Problems Identified and Solutions Developed
7. Collaborative Plan Projects Selected
8. Study Report Prepared

Study Assumptions Selected

- **Study Years for reliability analyses:**
  - **Near-term: 2019 Summer, 2019/2020 Winter**
  - **Longer-term: 2024 Summer**
- **LSEs provided:**
  - **Input for load forecasts and resource supply assumptions**
  - **Dispatch order for their resources**
- **Interchange coordinated between Participants and neighboring systems**

Study Criteria Established

- **NERC Reliability Standards**
  - **Current standards for base study screening**
  - **Current SERC Requirements**
- **Individual company criteria**

Study Methodologies Selected

- **Thermal Power Flow Analysis**
- **Each system (DEC and DEP) will be tested for impact of other system's contingencies**

Base Case Models Developed

- Started with 2013 series MMWG cases
- Latest updates to detailed models for DEC and DEP systems are included
- Adjustments were made based on additional coordination with neighboring transmission systems
- Planned transmission additions from updated 2013 Plan were included in models

Resource Supply Options Selected

- **Last year**
  - **Hypothetical 1000 MW import/export scenarios**
  - **Coordination with PJM for modeling transfers**
- **This year**
  - **Special request from NCUC**

Thermal Technical Analysis

- **Conduct thermal screenings of the 2019 and 2024 base cases**

Problems Identified and Solutions Developed

- Identify limitations and develop potential alternative solutions for further testing and evaluation
- TAG input will be solicited on other potential solutions
- Estimate project costs and schedule

Collaborative Plan Projects Selected

- Compare all alternatives and select preferred solutions

Study Report Prepared

- Prepare draft report and distribute to TAG for review and comment

Questions ?

Joint Inter-Regional Study Scope and Study Activities

Bob Pierce

Duke Energy Carolinas

Special Request from NCUC

- **NCUC requested Joint Study involving NCTPC, PJM, MISO, and NERC**
- **PJM capacity auction for 2016/17 delivery year resulted in approximately 7500 MW from generation outside of PJM**
- **Study should consider whether this generation that is external to PJM could cause congestion on the transmission grid in North Carolina**
- **Study scope documents (reliability and economic) have been finalized by the participating parties**

Joint Study

Reliability Study

- Base model - 2016S peak load based on 2013 series MMWG model.
- MISO and PJM market dispatch incorporated including resources from PJM's 2016/2017 Base Residual Capacity Auction.
- Detailed internal models of participants will be included and appropriate study files exchanged.
- NCTPC and PJM will run contingency analysis of the study area to identify impacts and potential solutions.
- Final report will include reliability and economic study results.

Joint Study

Economic Study

- **Performed by Duke Energy Resource Planning and PJM Interregional Planning Department using production costing models.**
- **Current assumptions for load forecast, resource plan, fuel prices…. will be utilized, consistent with standard practices and DEC/DEP IRP.**
- **Utilizing the impacts caused by the transfer of the resources identified in the reliability study, assess possible effects on the annual production costs of the DEC and DEP systems.**
- **Pipe and bubble type analysis will be performed utilizing FCITC results from the reliability study model.**

Questions ?

MISO/Entergy Integration Operations Reliability Coordination Agreement (ORCA)

Bob Pierce

Duke Energy Carolinas

MISO/Entergy Integration

MISO South

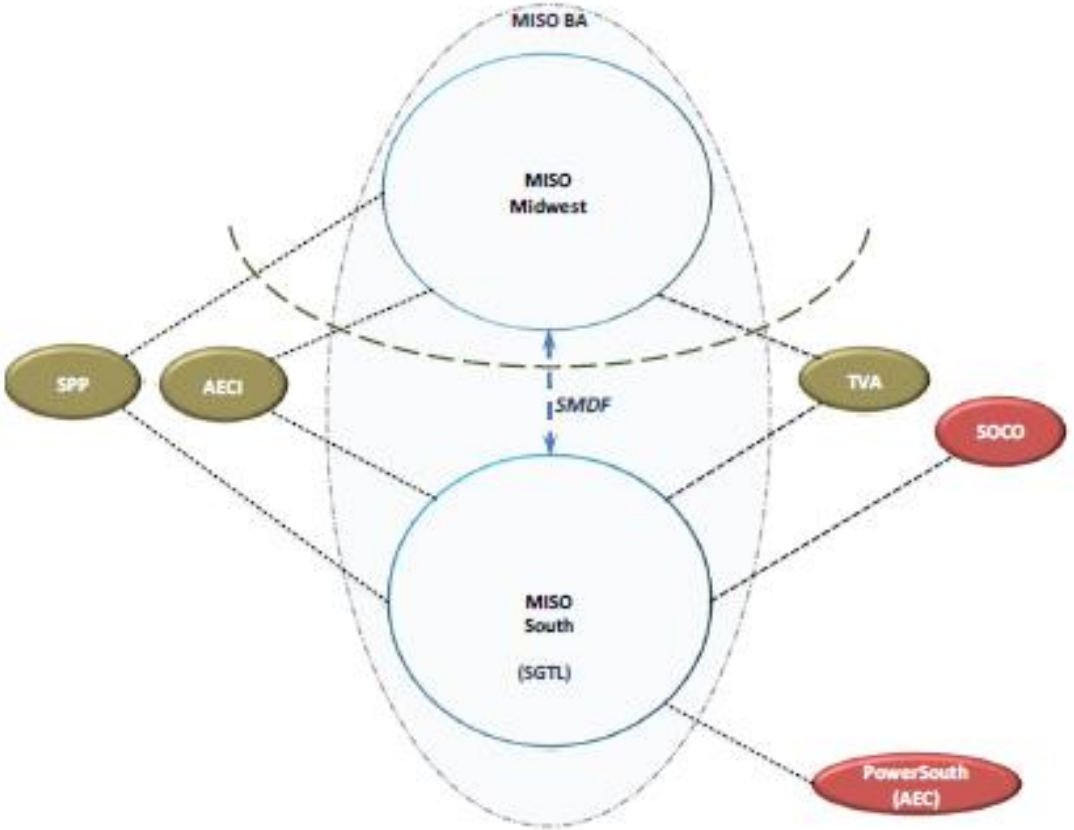
- Entergy Operating Companies (including, but not limited to, Entergy Arkansas, Inc., Entergy Gulf States Louisiana, L.L.C., Entergy Louisiana LLC, Entergy Mississippi, Inc., Entergy New Orleans, Inc. and Entergy Texas, Inc.),
- Louisiana Energy and Power Authority,
- Lafayette Utilities System,
- South Mississippi Electric Power Association,
- Cleco Corporation,
- NRG/Louisiana Generating, LLC (including West Memphis, North Little Rock and Conway)

MISO/Entergy Integration

The Joint Parties (SPP, TVA, Southern, AECI, PowerSouth, Louisville Gas and Electric, and Kentucky Utilities) entered into an Operating Reliability Coordination Agreement (ORCA) with MISO.

The ORCA provides a long term road map for coordination and study between the Parties to ensure reliability in the consolidated MISO BA that stretches from the gulf coast through middle America to the US Canadian border.

MISO/Entergy Integration



ORCA Phase Description

Phase 1	Phase 2	Phase 3
Through April 19 2014*	**Through Oct. 01 2014***	**Through April 01 2015**
2000MW Dispatch Flow Limit	Dispatch Flow limit set with two day ahead process*	Dispatch Flow limit set with one day ahead process*
MISO adjusts Dispatch Flow between 1500MW and 2000MW for congestion	Respect 2 day ahead Dispatch Flow limit	Respect 1 day ahead dispatch flow limit
If Dispatch Flow < 1500MW, use pre-existing congestion management processes (TLR)	If Dispatch Flow < 2 DA Limit, use pre-existing congestion management processes (TLR)	If Dispatch Flow < 1 DA Limit, use pre-existing congestion management processes (TLR)
Use Intra-day adjustment process to increase limit*	Use Intra-day adjustment process to increase limit*	Use Intra-day adjustment process to increase limit*
Develop Phase 2 process	Develop Phase 3 process	Develop Seams Agreement

* or upon completion of testing and validation

Operational Protocols

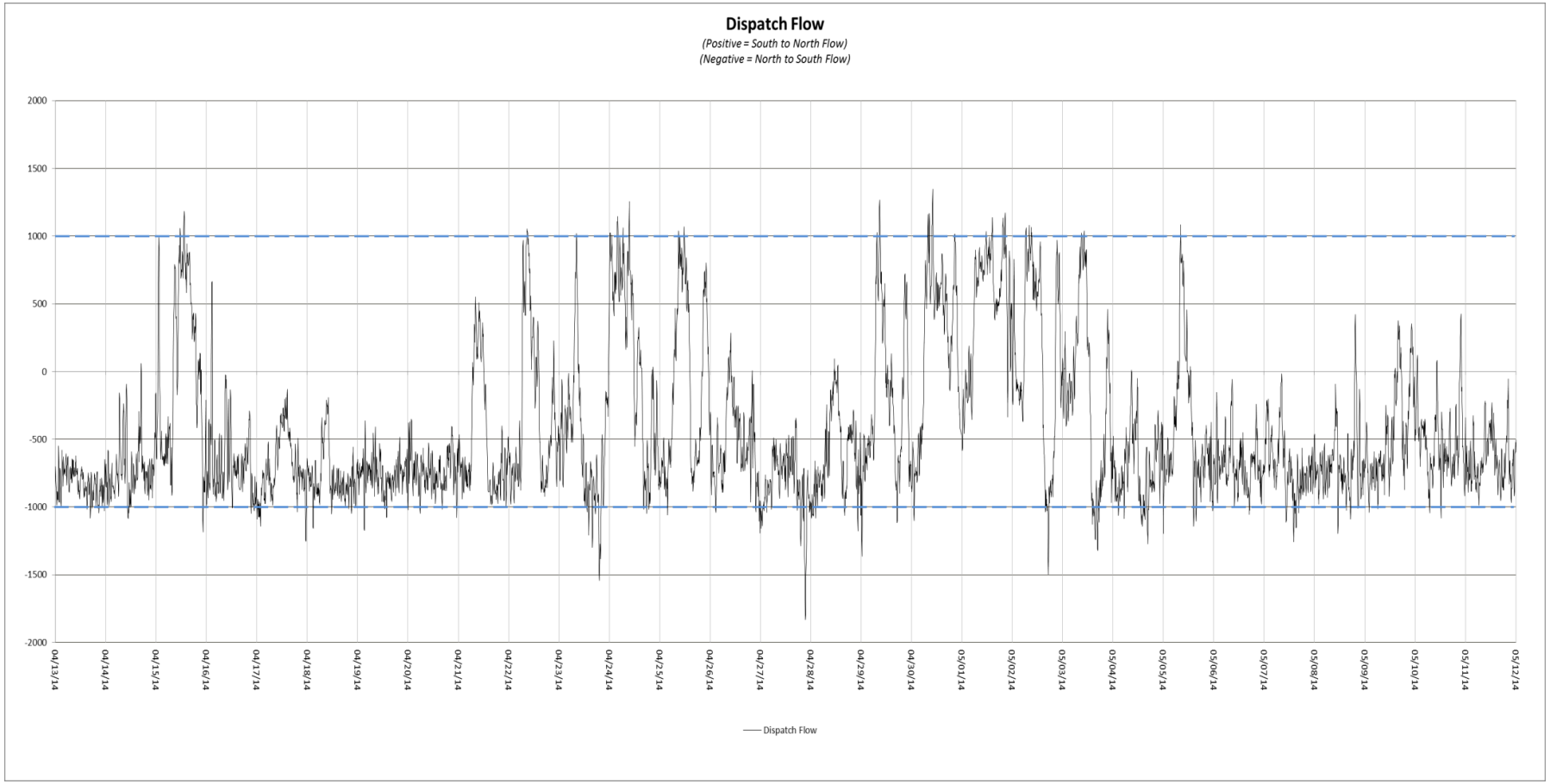
- **Normal Operations**
  - Day-Ahead
    - Enforce target in Day-Ahead market
    - No specific South Region reserve procurement requirements
  - Real-Time
    - 1000 MW target managed similar to System Operating Limit
      - Reduce the time duration of exceedance, less than 30 minutes
    - No specific South Region reserve procurement requirements
    - DCS Events
      - Recover from DCS event per NERC standards first
      - Implement actions to reduce flow within 30 minutes

Operational Protocols

- **Normal Operations (continued)**
  - Real-Time (continued)
    - Control actions
      - Bind on constraint to manage flows
      - Commit South Region units as necessary/available for N-S flows
      - Decommit South Region units for S-N flows (Min Gen type process)
      - Transmission constraints are priority over returning flows within target

Operational Protocols

- **Emergency Operations**
  - Relax target to ORCA limits (± 2000MW) as necessary for:
    - Transmission emergencies (Local and System)
    - Capacity emergencies when Max Gen Alert declared
    - Surplus conditions when Min Gen Alert declared



- Dispatch flow within ±1000MW target for 95% of intervals
- Predominant average dispatch flow of ~780MW within average volatility of ~310MW

Questions ?

Regional Studies Reports

Bob Pierce

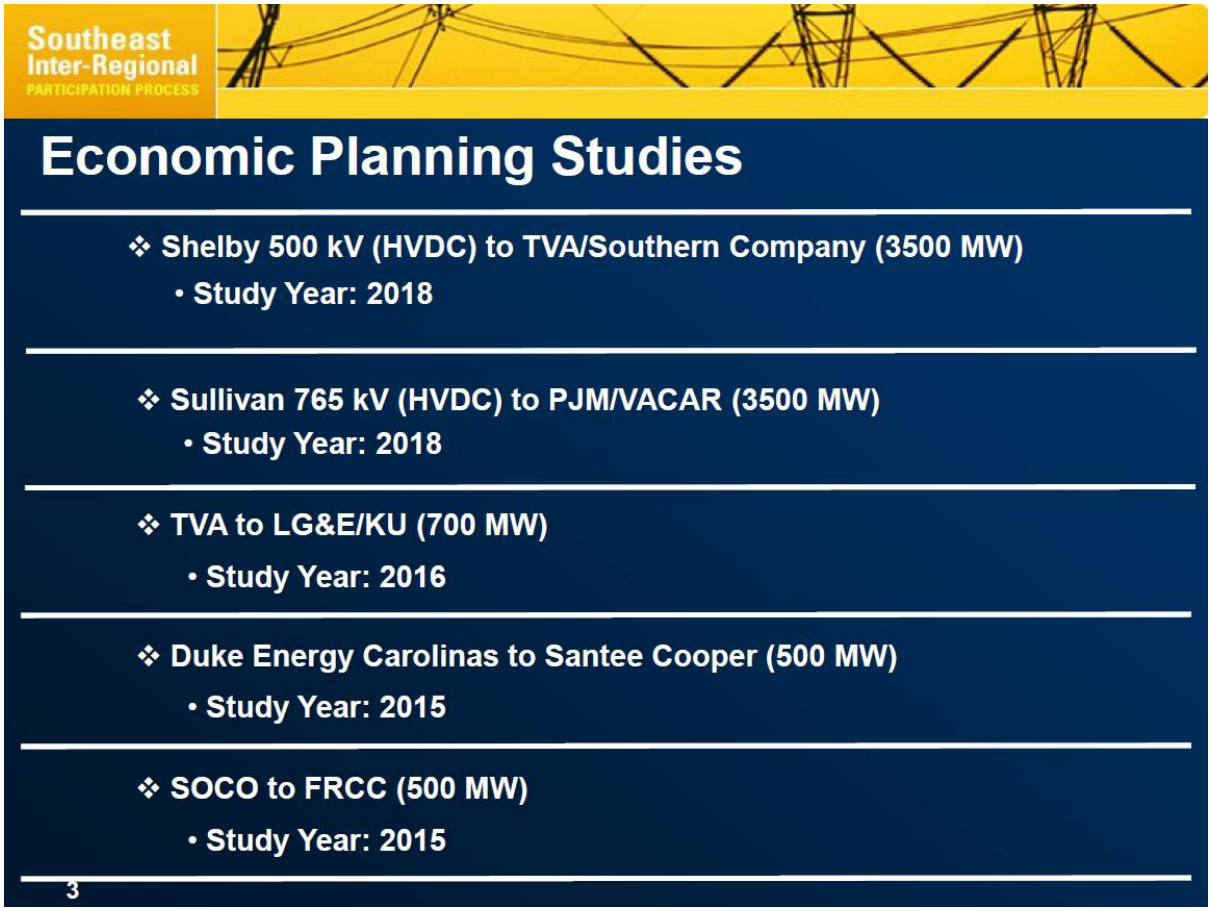
Duke Energy Carolinas

Southeast Inter-Regional Participation Process (SIRPP)

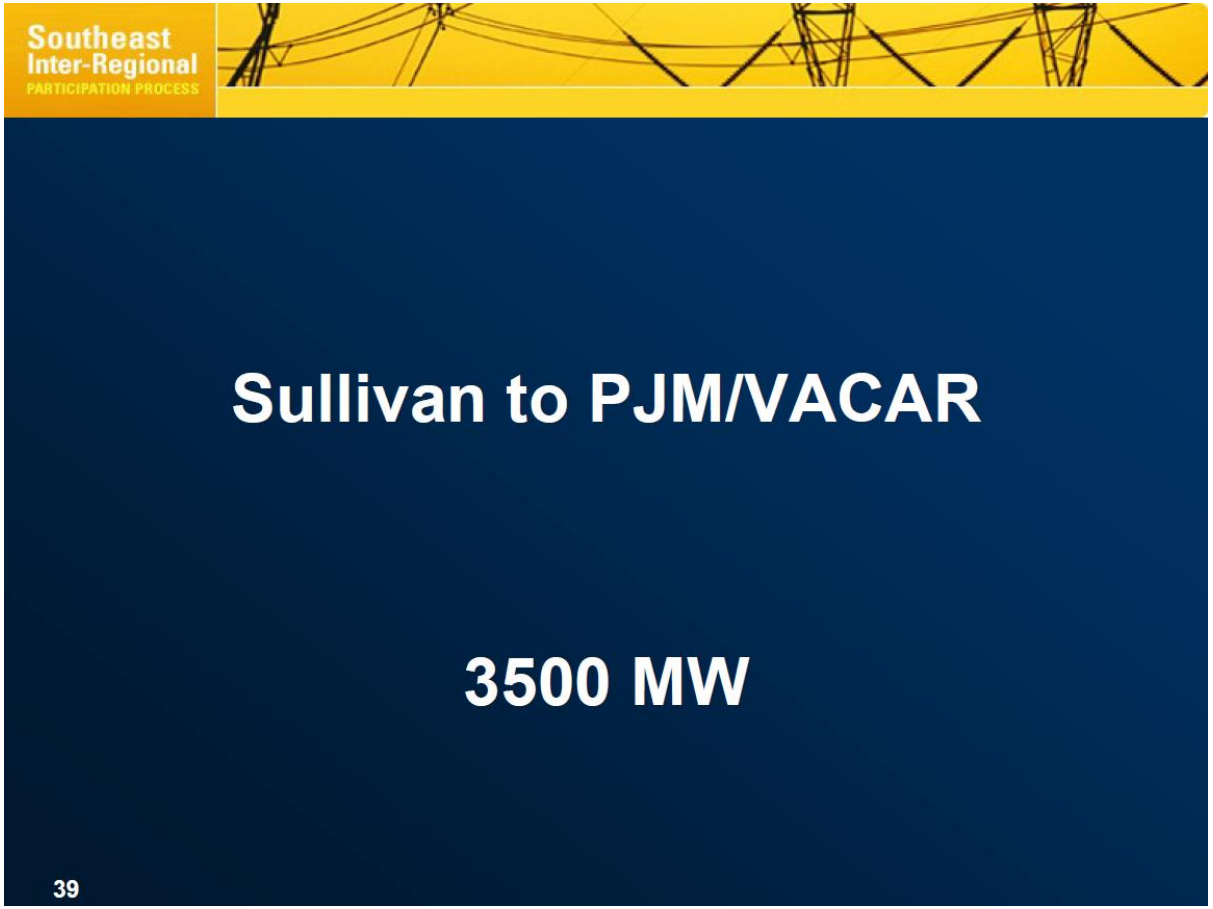
SIRPP

Preliminary study results have been posted

SIRPP


Southeast
Inter-Regional
PARTICIPATION PROCESS
Economic Planning Studies
❖ Shelby 500 kV (HVDC) to TVA/Southern Company (3500 MW)
• Study Year: 2018
❖ Sullivan 765 kV (HVDC) to PJM/VACAR (3500 MW)
• Study Year: 2018
❖ TVA to LG&E/KU (700 MW)
• Study Year: 2016
❖ Duke Energy Carolinas to Santee Cooper (500 MW)
• Study Year: 2015
❖ SOCO to FRCC (500 MW)
• Study Year: 2015
3

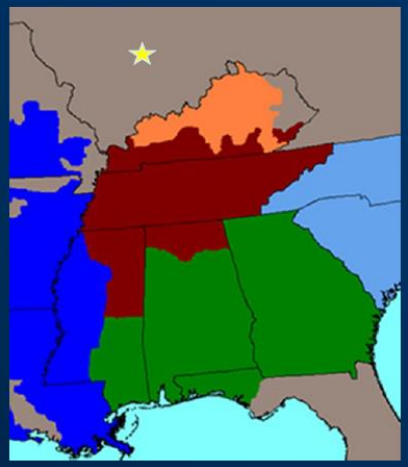
SIRPP


Southeast
Inter-Regional
PARTICIPATION PROCESS
Sullivan to PJM/VACAR
3500 MW
39

SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

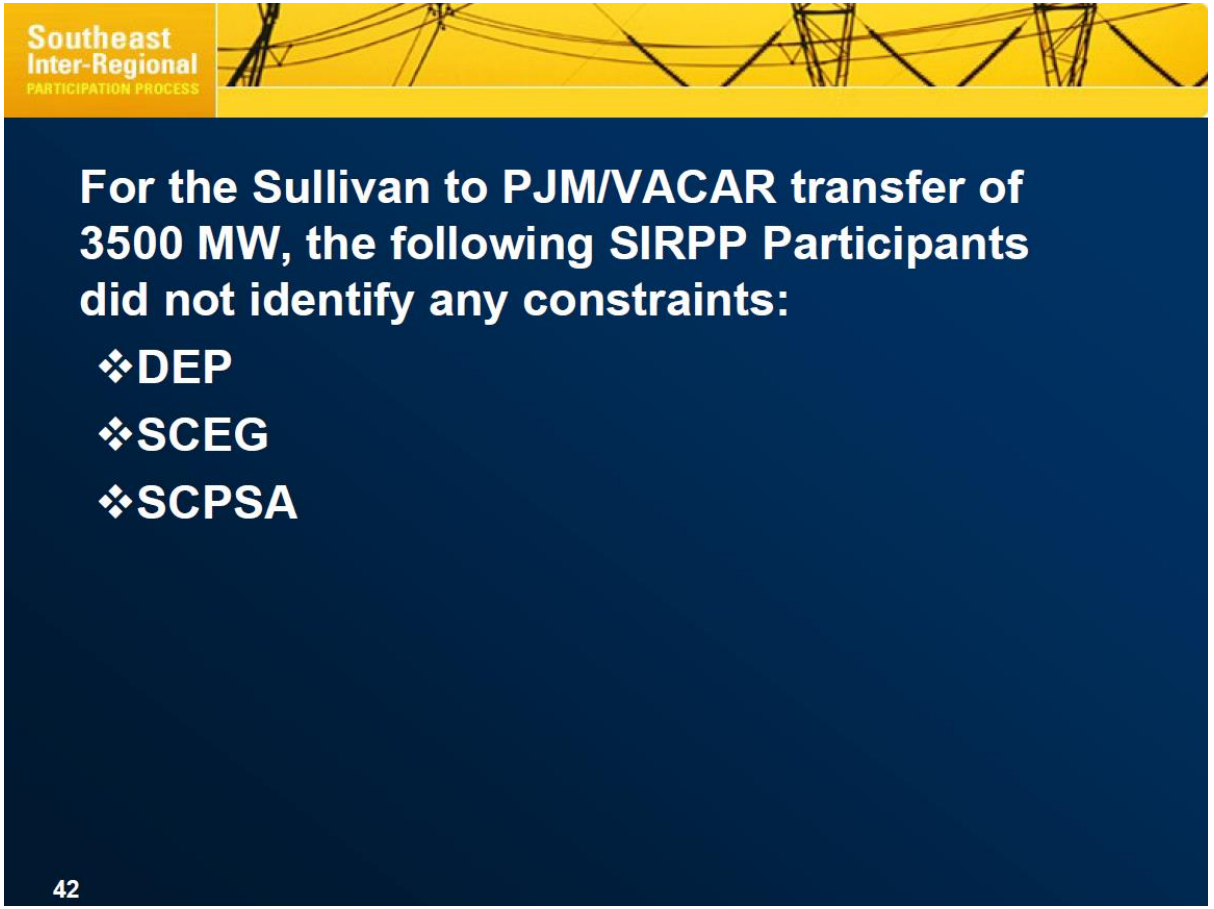
Sullivan to PJM/VACAR



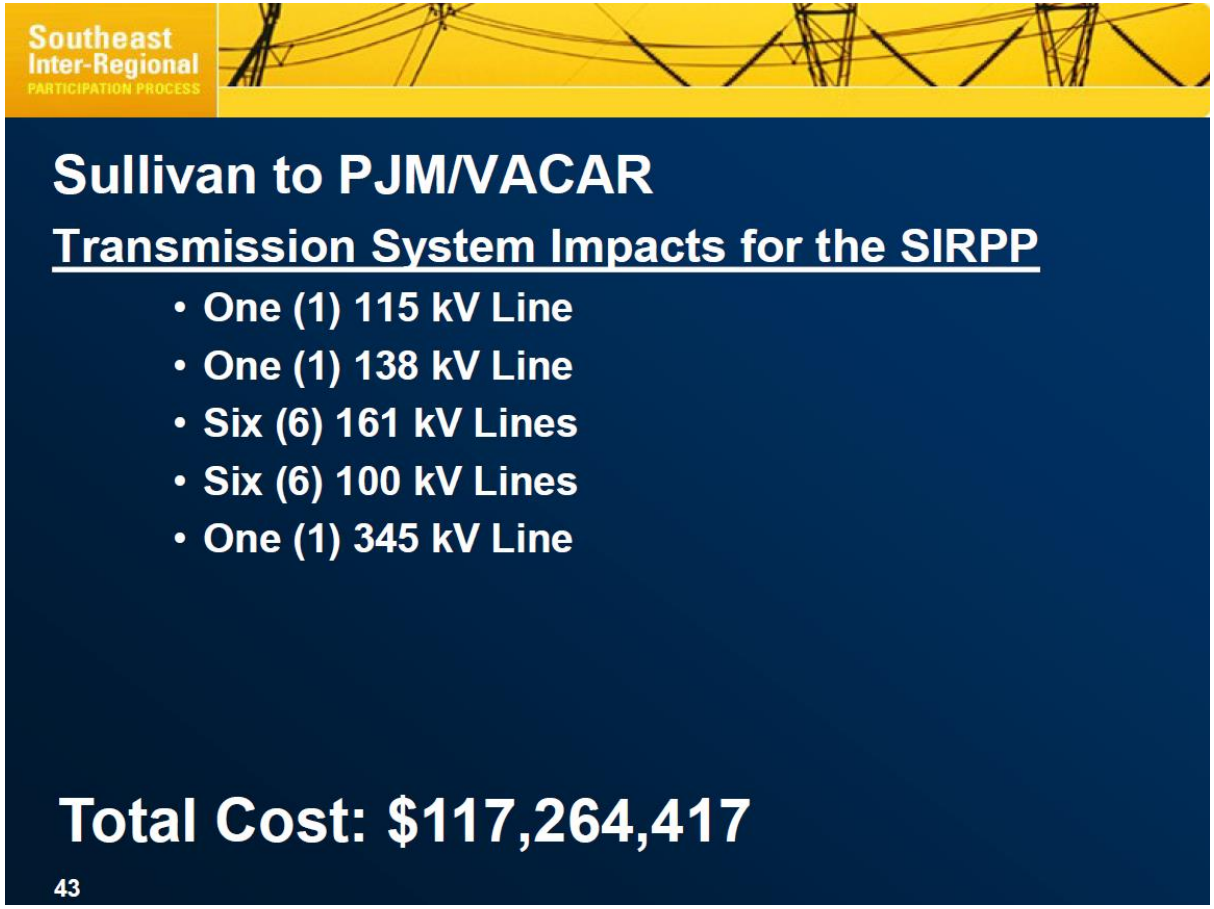
- **Source:**
  - New generator interconnection to existing Sullivan 765 kV Substation (3500 MW)
- **Sink:**
  - 2000 MW – PJM Load
  - 1500 MW – VACAR Generation
    - DEP 31.0% | DEC 47.5% | SCEG 10.8% | SCPSA 10.7%
- **Step 2 Evaluation**

40

SIRPP


Southeast
Inter-Regional
PARTICIPATION PROCESS
For the Sullivan to PJM/VACAR transfer of 3500 MW, the following SIRPP Participants did not identify any constraints:
❖DEP
❖SCEG
❖SCPSA
42

SIRPP


Southeast
Inter-Regional
PARTICIPATION PROCESS
Sullivan to PJM/VACAR
Transmission System Impacts for the SIRPP
• One (1) 115 kV Line
• One (1) 138 kV Line
• Six (6) 161 kV Lines
• Six (6) 100 kV Lines
• One (1) 345 kV Line
Total Cost: $117,264,417
43

SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

Sullivan to PJM/VACAR – DEC Screen Results

❖ Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Reconductor (Bundle) 0.97 mile 477 ACSR Asheville Hwy-Nix Rd Tap 100 kV Line	$ 434,190
P2	Reconductor 2.10 mile 2/0 Cu Campton Retail-Inman Tie 100 kV Line	$ 636,835
P3	Reconductor 5.27 mile 266.8 ACSR Tiger Tie-Springs Lyman Tap-Lelia Retail Tap 100 kV Line	$1,513,191
P4	Reconductor (Bundle) 4.63 mile 477 ACSR Pisgah Tie-Blantyre Retail 100 kV Line	$1,165,147
P5	Reconductor (Bundle) 11.53 mile 477 ACSR Horseshoe Tie-Blantyre Retail 100 kV Line	$2,280,267

48

SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

Sullivan to PJM/VACAR – DEC Screen Results

- Projects Identified

Item	Proposed Enhancements	Cost ($)
P6	Reconductor (Bundle) 1.53 mile 477 ACSR Verdae Retail Tap-Laurel Creek Retail Tap 100 kV Lines	$ 184,787

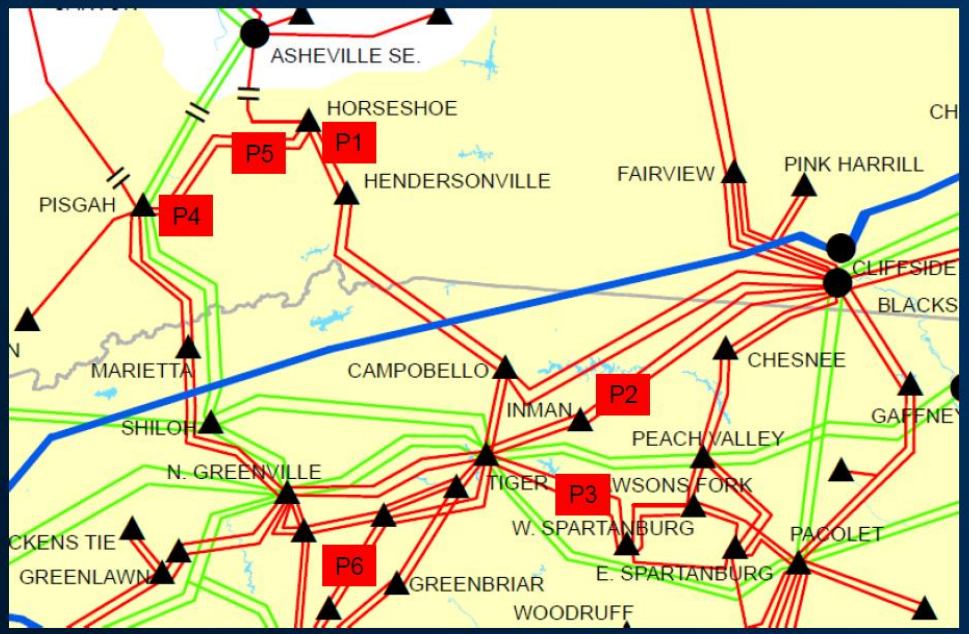
Total Cost (2014$) = $6,214,417

49

SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

Proposed Enhancements



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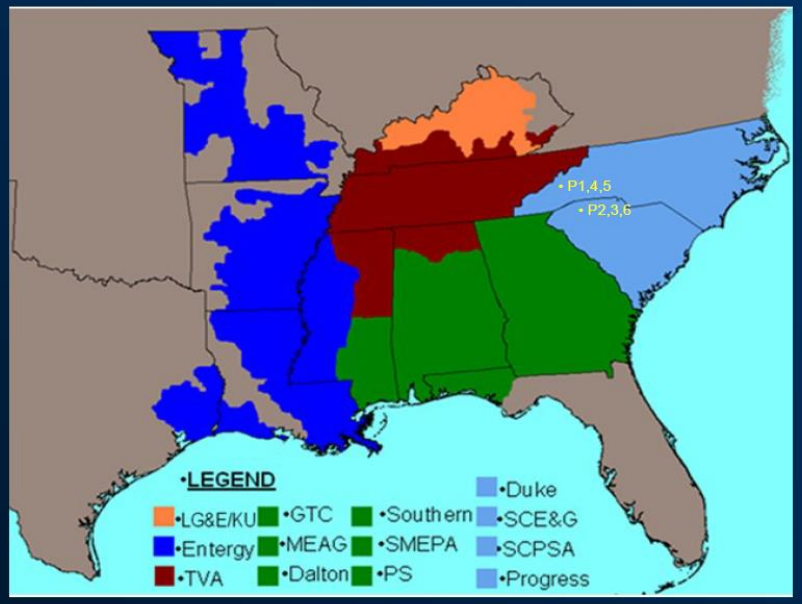
SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



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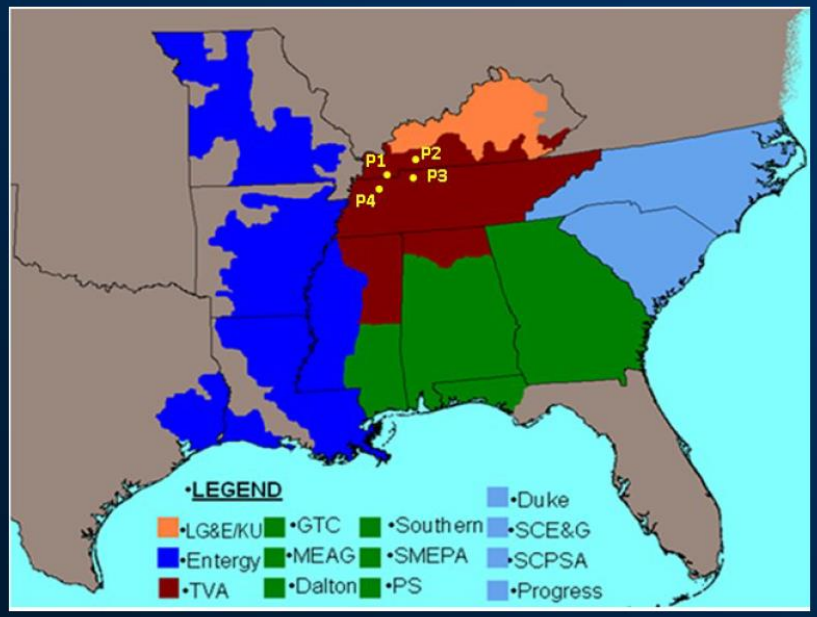
SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



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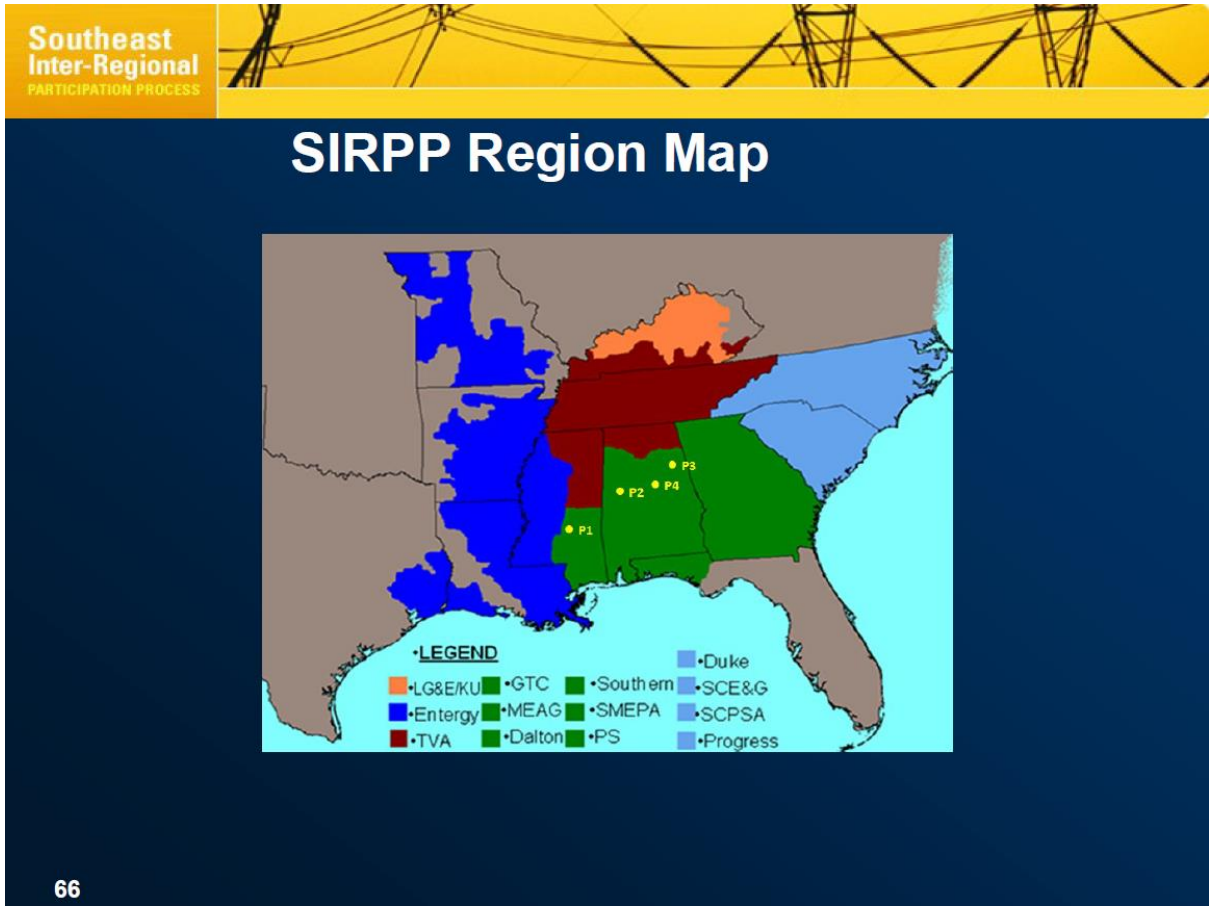
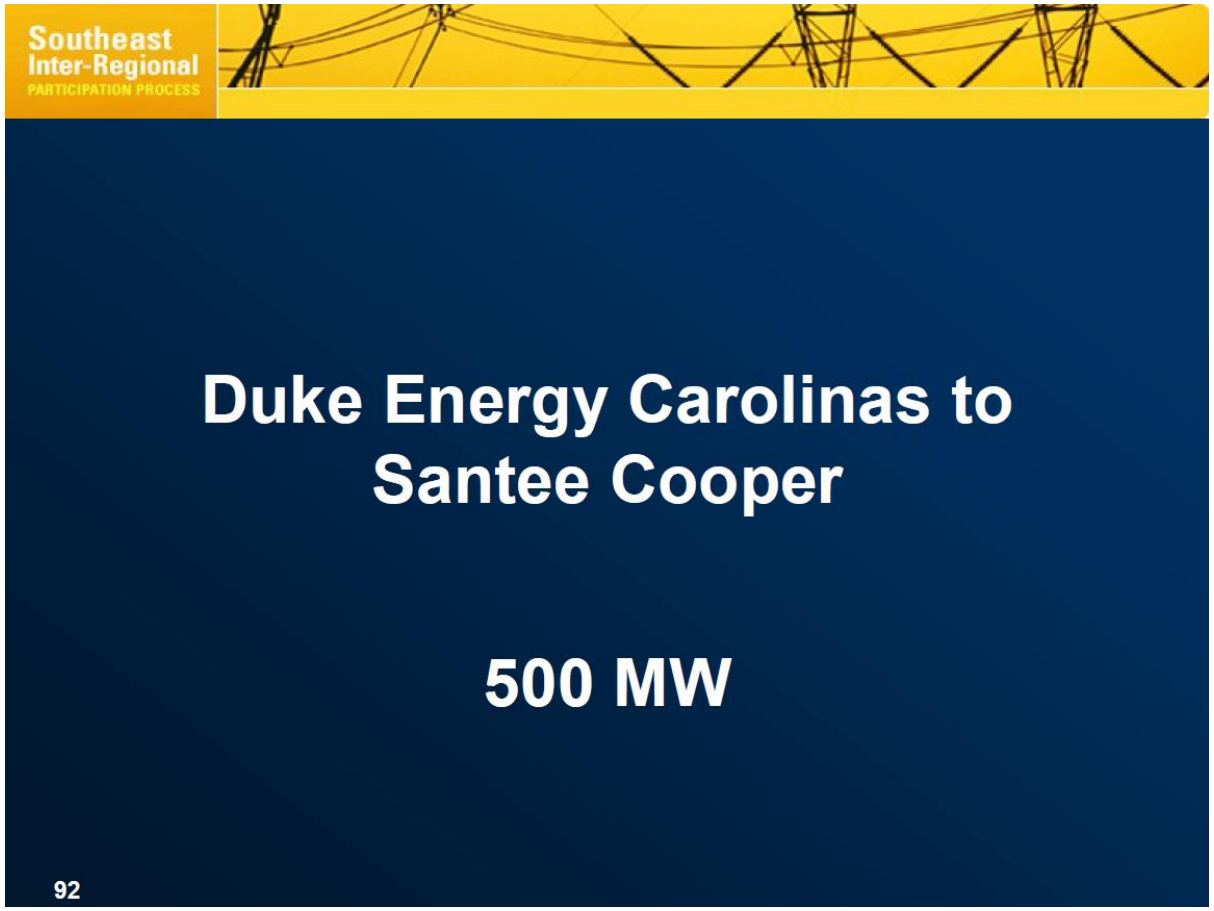
SIRPP


Southeast
Inter-Regional
PARTICIPATION PROCESS
SIRPP Region Map
P1
P2
P3
P4
LEGEND
LG&E/KU
Entergy
TVA
GTC
MEAG
Dalton
Southern
SMEPA
PS
Duke
SCE&G
SCPSA
Progress
66

SIRPP


Southeast
Inter-Regional
PARTICIPATION PROCESS
Duke Energy Carolinas to
Santee Cooper
500 MW
92

SIRPP

Southeast Inter-Regional PARTICIPATION PROCESS

For the DEC to SCPSA transfer of 500 MW, the following SIRPP Participants did not identify any constraints:

- DEC
- LG&E/KU
- DEP
- SCE&G
- SCPSA
- SOCO
- TVA

95

http://www.southeastirpp.com/

SERC Long Term Study Group Update

SERC Long Term Study Group

- Building 2014 series of MMWG cases
- Updating 2013 series 2014 Winter MMWG model for ERAG study
- Will begin study of 2016 Summer including sensitivity case with PJM/MISO market dispatch
- Supporting 2014 RAWG (Resource Adequacy Working Group) assessment

Eastern Interconnection Planning Collaborative (EIPC)

EIPC

Scenario A – 2023S NY TOTS

Evaluation of the impact of the New York Transmission Owners' Transmission Solutions. Development of other scenarios such as the shutdown of nuclear plants or other regional generation, or additional sensitivities that include additional regional transmission build-outs, would be handled, as appropriate, by the region involved rather than become part of the EIPC analysis.

EIPC

Scenario B – 2023S Drought Scenario

Starting from the updated base case (Scenario A), the drought scenario suggested by the Eastern Interconnection States Planning Council (EISPC) would be studied including various transfers into the Southeast. EIPC recognizes this needs additional discussion with EISPC and specification of additional detail, which will be the first step in the scenario analysis process.

http://www.eipconline.com/

SERTP

Planning Activities

- Compiling Transmission Expansion Plan draft
- Presentation materials for June 27th stakeholder meeting
- Finalizing 2014 library of models

http://www.southeasternrtp.com/

NERC Reliability Standards Update

- BES definition – effective 7/1/14
- Physical Security Standards - Implementation

Questions ?

2014 TAG Work Plan

Rich Wodyka

ITP

2014 NCTPC Overview Schedule

Reliability Planning Process

- Evaluate current reliability problems and transmission upgrade plans
- Perform analysis, identify problems, and develop solutions
- Review Reliability Study Results

Enhanced Access Planning Process

- Propose and select enhanced access scenarios and interface
- Perform analysis, identify problems, and develop solutions
- Review Enhanced Access Study Results

Coordinated Plan Development

- Combine Reliability and Enhanced Results
- OSC publishes DRAFT Plan
- TAG review and comment

FERC Order 1000 Updates

TAG Meetings

2014 TAG Work Plan

January – February

- **2014 Study – Finalize Study Scope of Work**
  - ✓ **Receive final 2014 Reliability Study Scope for comment**
  - ✓ **Review and provide comments to the OSC on the final 2014 Study Scope**
  - ✓ **Receive request from OSC to provide input on proposed Enhanced Transmission Access scenarios and interfaces for study**
  - ✓ **Provide input to the OSC on proposed Enhanced Transmission Access scenarios and interfaces for study**

March 11, 2014

TAG Meeting

- **2014 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities**
- **Order 1000 Update**
  - ✓ **Receive an update on the NCTPC activities as they relate to Order 1000 compliance**
- **Operations Reliability Coordination Agreement (ORCA)**
  - ✓ **Receive an update on the ORCA activities**

April - May - June

TAG Meeting – June 16, 2014

- **2014 Reliability Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities**
- **Joint Inter-Regional Study Update**
  - ✓ **Receive a progress report on the Joint Inter-Regional study activities**
- **Order 1000 Update**
  - ✓ **Receive an update on the NCTPC activities as they relate to Order 1000 compliance**
- **Operations Reliability Coordination Agreement (ORCA)**
  - ✓ **Receive an update on the ORCA activities**

July - August - September

- **2014 Reliability Study - Technical Analysis, Problem Identification, and Solution Development**
  - **TAG will be requested to provide input to the OSC and PWG on the technical analysis performed, the problems identified as well as proposing alternative solutions to the problems identified**
  - **TAG will be requested to provide input to the OSC and PWG on any proposed alternative solutions to the problems identified through the technical analysis**

July - August - September

- **2014 Reliability Study Update**
  - **Receive a progress report on the Reliability Planning study activities and preliminary results**
  - **Receive update status of the upgrades in the 2013 Collaborative Plan**
- **2014 Selection of Solutions**
  - **TAG will receive feedback from the OSC on any alternative solutions that were proposed by TAG members**

July - August - September

TAG Meeting – September TBD

- **2014 Study Update**
  - **Receive a progress report on the Reliability Planning study activities and preliminary results**
- **Joint Inter-Regional Study Update**
  - **Receive a progress report on the Joint Inter-Regional study activities**
- **Order 1000 Update**
  - **Receive an update on the NCTPC activities as they relate to Order 1000 compliance**
- **Operations Reliability Coordination Agreement (ORCA)**
  - **Receive an update on the ORCA activities**

October - November - December

- **2014 Reliability Study Update**
  - **Receive and comment on final draft of the 2014 Collaborative Transmission Plan report**
  - **Discuss potential study scope for 2015 studies**
- **Joint Inter-Regional Study Update**
  - **Receive a progress report on the Joint Inter-Regional study activities**

October - November - December

TAG Meeting

- **2014 Study Update**
  - **Receive presentation on the draft report of 2014 Collaborative Transmission Plan**
  - **Discuss potential study scope for 2015 studies**
- **Joint Inter-Regional Study Update**
  - **Receive a progress report on the Joint Inter-Regional study activities**
- **Order 1000 Update**
  - **Receive an update on the NCTPC activities as they relate to Order 1000 compliance**
- **Operations Reliability Coordination Agreement (ORCA)**
  - **Receive an update on the ORCA activities**

Questions ?

TAG
Open Forum Discussion

Comments or Questions ?