



TAG Meeting

March 10, 2015

Teleconference / Webex



TAG Meeting Agenda

- 1. Administrative Items – Rich Wodyka**
- 2. 2015 Study Activities and Study Scope Report – James Manning**
- 3. Operations Reliability Coordination Agreement (ORCA) Report – Bob Pierce**
- 4. Regional Studies Update – Bob Pierce**
- 5. 2015 TAG Work Plan Update – Rich Wodyka**
- 6. TAG Open Forum – Rich Wodyka**



2015 Study Activities and Study Scope Report

**James Manning
NCEMC**



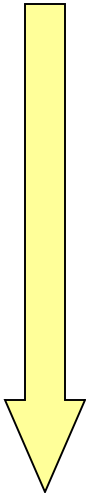
Studies for 2015

- **Annual Reliability Study**
 - **Assess DEC and DEP transmission systems' reliability and develop a single Collaborative Transmission Plan**
- **Resource Supply Scenarios**
 - **Assess DEC and DEP interface with neighboring systems modeling hypothetical transfers**
- **Local Economic Study Requests**
 - **Assess scenarios submitted by stakeholders before February 18th deadline**



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: 2020 Summer, 2020/2021 Winter
 - Longer-term: 2025 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**



Resource Supply Options Selected

- **Last year**
 - **Special Interregional Joint Study requested by NCUC involving NCTPC, PJM and MISO assessing the congestion and reliability impacts on the transmission grid in NC from about 7500 MW of external generation clearing in PJM’s capacity auction for 2016/2017 delivery year**
- **This year**
 - **Hypothetical 1000 MW import/export scenarios**
 - **Coordination with PJM for modeling transfers**



2025 Hypothetical Import / Export

Resource From	Sink	Test Level (MW)
PJM	DUK ¹	1,000
SOCO	DUK	1,000
SCEG	DUK	1,000
SCPSA	DUK	1,000
CPLE ²	DUK	1,000
TVA	DUK	1,000

1 – DUK is the Balancing Area for DEC

2 – CPLE is the eastern Balancing Area for DEP



2025 Hypothetical Import / Export

Resource From	Sink	Test Level (MW)
PJM	CPLE	1,000
SCEG	CPLE	1,000
SCPSA	CPLE	1,000
DUK	CPLE	1,000
DUK	SOCO	1,000



2025 Hypothetical Import / Export

Resource From	Sink	Test Level (MW)
PJM	DUK / CPLE	1,000 / 1,000
DUK / CPLE	PJM	1,000 / 1,000
CPLE	PJM	1,000
DUK	PJM	1,000
SOCO ³	PJM	1,000

3 – This hypothetical transfer is intended to evaluate the impact of a 1000MW Southern Co transaction through the DEC/DEP transmission systems into PJM.



Local Economic Study Requests

- **Last year**
 - **250 MW transfer from TVA to CPLW was studied**
- **This year**
 - **661 MW transfer from TVA Shelby 500 kV Sub to DEC/DEP control areas**
 - **Forced outage(s) of multiple nuclear units on DEC and DEP systems of Westinghouse 1980's vintage**



Local Economic Study Requests (continued)

- **661 MW transfer from TVA's Shelby 500 kV Sub to DEC/DEP control areas**
 - Requested by Clean Line Energy
 - Study year 2020 Summer
 - Allocated to DEC and DEP based on share of combined load



Local Economic Study Requests (continued)

- **Forced outage(s) of multiple nuclear units on DEC and DEP systems**
 - Requested by NCEMC
 - Study year 2020 Summer
 - DEC's McGuire Units (1 & 2) and Catawba Units (1 & 2) and DEP's Harris Unit 1
 - Capacity replacement internally first and then equally from Southern Company and PJM Market.



Base Case Model Development

- **Start with 2014 series MMWG cases**
- **Latest updates to detailed models for DEC and DEP systems will be included**
- **Adjustments will be made based on additional coordination with neighboring transmission systems**
- **Planned transmission additions from updated 2014 Plan will be included in models**



Technical Analysis

- **Conduct thermal screenings of the 2020 and 2025 base cases**
- **Conduct thermal screenings of both 2020 Local Economic Study requests**
- **Conduct thermal screenings of 2025 hypothetical transfer scenarios**



Problems Identified and Solutions Developed

- **Identify limitations and develop potential alternative solutions for further testing and evaluation**
- **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 ?





**MISO/Entergy Integration
Operations Reliability Coordination
Agreement (ORCA)**

**Bob Pierce
Duke Energy Carolinas**



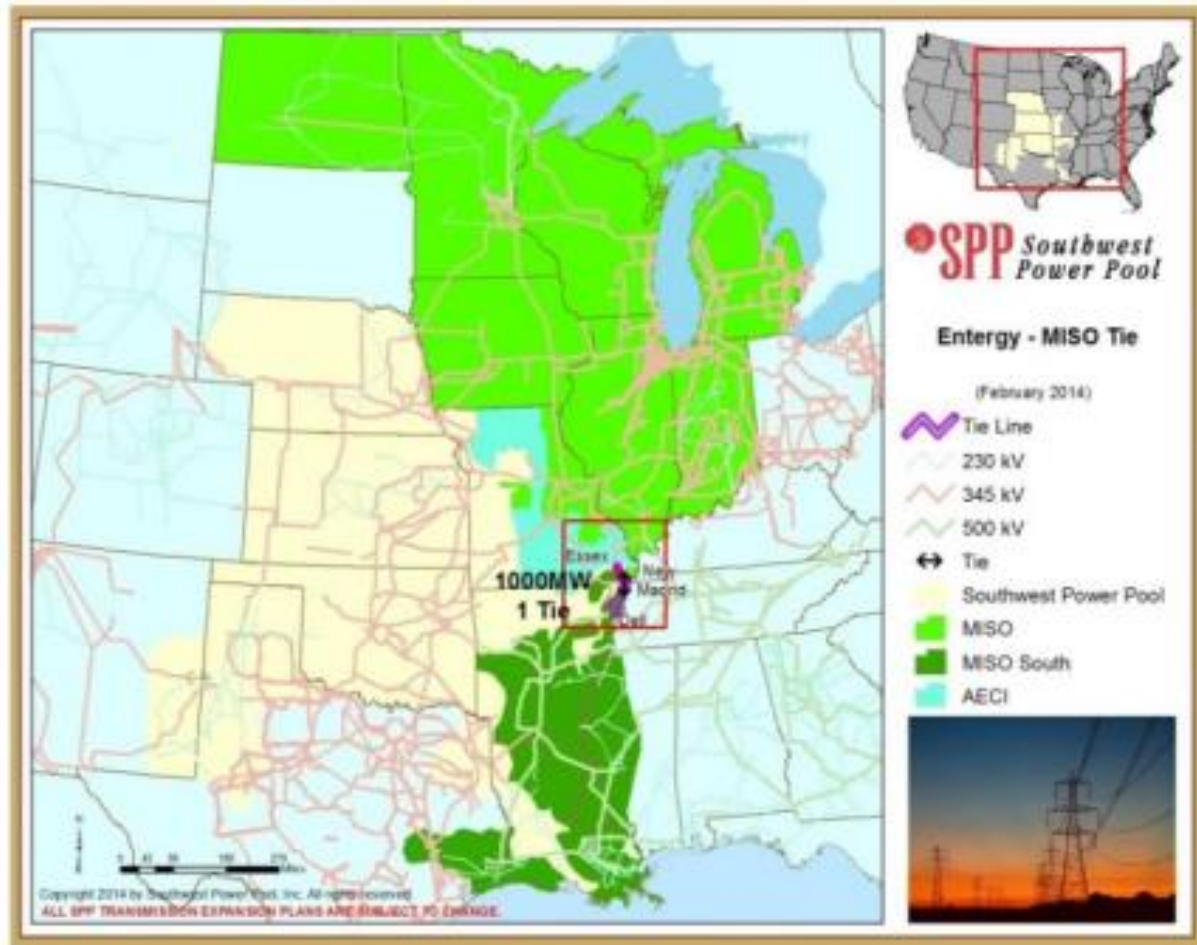
MISO/Entergy Integration

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





- **Purpose**
 - Provide an update on performance of the Sub-Regional Power Balance Constraint (SPRBC)
- **Time Period Evaluated**
 - July 17th, 2014 through January 29th, 2015
- **Key Takeaways**
 - The change in the behavior of the Real-Time calculated Intra-Regional flow noted in early November evened out later in the month
 - However, the higher percentage of binding South to North has continued
 - The SRPBC demand curve for transmission service agreements (Hurdle Rate) remains at \$9.57/MWh
 - Update on adjusting the hurdle rate process



Hurdle Rate Adjustment Status

July 17-December							
NO. DAYS	16	CAPACITY RATE		COMPONENT RATIOS		CURRENT HURDLE RATE	\$ 9.57
CHARGES	\$ 2,377,698.58	ORIGINAL	\$ 6.457	CAPACITY RATE	0.032		
REVENUE	\$ 2,187,313.23	CURRENT	\$ 6.664	REVENUE NEUTRALITY	1.087	ADJ. HURDLE RATE	\$ 10.71
TOTAL	\$ (190,385.35)			TOTAL	1.119		

- Since implementing the Hurdle Rate, a majority of hours are managed below the contract path, with prices below the hurdle rate.
- In MISO's Deficiency Response in October, we described the adjustment process, utilizing only days where at least 3 hours were set to the hurdle rate or higher, indicating economic utilization of capacity above 1,000 MW

$$Hurdle\ Rate_{prompt\ Month} = Hurdle\ Rate_{initial} \left\{ \left(\frac{SPP\ Capacity\ Rate_{current} - SPP\ Capacity\ Rate_{initial}}{SPP\ Capacity\ Rate_{initial}} \right) + \left(\frac{\sum SPP\ Invoice_{Effective\ Date\ to\ Current\ Period\ End\ Date}}{\sum RT\ SRPBC\ Revenue_{Effective\ Date\ to\ Current\ Period\ End\ Date}} \right) \right\}$$

Where:

- $Hurdle\ Rate_{initial} = \$9.57\ MWh\ Per\ Filing$
- $SPP\ Capacity\ Rate_{current} = \$MWhR\ Determined\ per\ Current\ Month\ Published\ Rates$
- $SPP\ Capacity\ Rate_{initial} = \$6.457\ MWhR\ Per\ Tab\ E\ to\ Filing$
- $SPP\ Invoice_{Effective\ Date\ to\ Current\ Period\ End\ Date} = SPP\ Invoice\ amounts\ starting\ July\ 17,\ 2014\ through\ the\ current\ month$
- $RT\ SRPBC\ Revenue_{Effective\ Date\ to\ Current\ Period\ End\ Date} = SRPBC\ Real\ Time\ Congestion\ Value\ starting\ July\ 17,\ 2014\ through\ the\ current\ month$



Hurdle Rate Adjustment Methodology (Compliance)

- Based on FERC’s December 12, 2014 order on the Hurdle Rate, MISO filed a replacement adjustment methodology that removes congestion revenue
- This is also consistent with the required changes to the Initial Hurdle Rate calculation, to only include Dispatch flows above the 1,000 MW threshold
- In addition to the increase in the Initial Hurdle Rate, the adjustment will significantly increase the Hurdle Rate to around \$171 upon acceptance

Month	A SPP Cap Rate (Calc. \$/MWhR)	B Billable MW (From SPP Bill)	C Billable MWhR (B * 24)	D Chargeable Intra-regional Flow (MWh)	E Cap Factor (% (D / C)	F Raw Hurdle Rate (\$/MWh) (A / D)	G Correction Factor (% (J/(D*F))	H Adj Hurdle Rate (\$/MWh) (F*G)	I Est. Charges (\$ (D * F)	J SPP Invoice (\$) (From SPP Bill)	K Hurdle Rate Sufficiency (%)
July 17-31 2014	\$6.64	12365	296760	18292	6.16%	\$107.68	95.69%	\$103.03	\$1,884,697.46	\$1,884,697.46	100.00%
August 2014	\$6.68	24605	590520	34951	5.92%	\$112.81	96.01%	\$108.31	\$3,785,456.14	\$3,785,456.14	100.00%
September 2014	\$6.59	28808	691392	16879	2.44%	\$270.06	95.96%	\$259.14	\$4,374,080.19	\$4,374,080.19	100.00%
October 2014	\$6.57	22314	535536	14075	2.63%	\$250.09	94.03%	\$235.16	\$3,309,812.91	\$3,309,812.91	100.00%
November 2014	\$6.61	20039	480936	17166	3.57%	\$185.19	94.50%	\$175.01	\$3,004,196.11	\$3,004,196.11	100.00%
December 2014	\$6.47	19007	456168	10164	2.23%	\$290.15	94.11%	\$273.06	\$2,775,340.49	\$2,775,340.49	100.00%
July 17-December	\$6.59	127138	3051312	111527	3.66%	\$180.37	95.12%	\$171.56	\$19,133,583.30	\$19,133,583.30	100.00%

$$\text{Adjusted Hurdle Rate}_{\text{Prompt month}} = \text{Raw Hurdle Rate}_{\text{Period}} * \text{Correction Factor}_{\text{Period}}$$

Where:

$$\text{Raw Hurdle Rate}_{\text{Period}} = \text{SPP Capacity Rate}_{\text{Period}} / \{ \text{Chargeable Intra - regional Flow}_{\text{Period}} / (\text{Billable MW}_{\text{Period}} * 24) \}$$

And;

$$\text{Correction Factor}_{\text{Period}} = \{ \text{SPP Invoice Charges}_{\text{Period}} / (\text{Chargeable Intra - regional Flow}_{\text{Period}} * \text{Raw Price}_{\text{Period}}) \}$$

Given:

Period = Period starting July 17, 2014 through end of previous month

SPP Capacity Rate_{Period} = Average of Monthly SPP Capacity Rates during period (calc. per Initial Hurdle Rate methodology)

Chargeable Intra - regional Flow_{Period} = Sum of hourly integrated intra - regional flows > 1000MW over period

Billable MW_{Period} = Sum of SPP invoiced Billable MW over period

SPP Invoice Charges_{Period} = Total SPP Invoiced charges (not including interest charges) over period



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

- The ORCA has been extended through April 1, 2016.
- Raised flow limit to 3000 MW.
- MISO has approval from FERC to temporarily suspend action on long term transmission service requests between MISO North and South until April 1, 2015.



Questions?





Regional Studies Reports

Bob Pierce - Duke



**MISO/NCTPC/PJM
JOINT STUDY**



MISO/NCTPC/PJM JOINT STUDY

- Study report has been approved and posted on the NCTCP website
- There were no substantive changes to the report from what was presented in the last TAG meeting



SERC Long Term Study Group Update



SERC Long Term Study Group

- Building 2015 series of LTSG cases
- Discussing desired RTO/ISO market representation in models and how to perform NTSG (Operating Horizon) and LTSG (Planning Horizon) studies



Eastern Interconnection Planning Collaborative (EIPC)



EIPC

Planning Activities

- **Working on building 2025 Summer and Winter models**
- **Will screen models later in year**
- **Considering developing production cost analysis capability**



<http://www.eipconline.com/>



SERTP



SERTP

- **Building 2015 series of models through 2025 Winter**
- **Work ongoing to establish Order 1000 required processes for coordination with other regions**
- **Stakeholder meeting on March 26th**



<http://www.southeasternrtp.com/>



Questions?





2015 TAG Work Plan

Rich Wodyka
Administrator



2015 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

Local Economic Planning Process

- Propose and select Local Economic Study scenarios and interface
 - Perform analysis, identify problems, and develop solutions
 - Review Local Economic Study Results

Coordinated Plan Development

- Combine Reliability and Local Economic Study Results
 - OSC publishes DRAFT Plan
- TAG review and comment

TAG Meetings



1st Quarter

2nd Quarter

3rd Quarter

4th Quarter

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2015 TAG Work Plan

January – February

- **2015 Study – Finalize Study Scope of Work**
 - ✓ **Receive final 2015 Reliability Study Scope for comment**
 - ✓ **Review and provide comments to the OSC on the final 2015 Study Scope**
 - ✓ **Receive request from OSC to provide input on proposed Economic Study scenarios and interfaces for study**
 - ✓ **Provide input to the OSC on proposed Local Economic Study scenarios and interfaces for study**



March

TAG Meeting

➤ 2015 Study Update

- ✓ **Receive a progress report on the Reliability Planning study activities**
- ✓ **Receive a report on the Local Economic Study scope**

➤ Operations Reliability Coordination Agreement (ORCA)

- ✓ **Receive an update on the ORCA activities**



April - May - June

- **2015 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**



April - May - June

TAG Meeting – June 8th Tentative Date

- **2015 Study Update**
 - Receive a progress report on the Reliability and Local Economic Planning study activities and preliminary results
 - Receive update status of the upgrades in the 2014 Collaborative Plan

- **Operations Reliability Coordination Agreement (ORCA)**
 - Receive an update on the ORCA activities



July - August - September

➤ 2015 Study Update

- Receive a progress report on the Reliability and Local Economic Planning study activities and preliminary results**

➤ 2015 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

➤ 2015 Study Update

- Receive a progress report on the Reliability and Local Economic Planning study activities and preliminary results**

➤ Operations Reliability Coordination Agreement (ORCA)

- Receive an update on the ORCA activities**



October - November - December

➤ 2015 Study Update

- Receive and comment on final draft of the 2015 Collaborative Transmission Plan report**
- Discuss potential study scope for 2016 studies**



October - November - December

TAG Meeting

➤ 2015 Study Update

- Receive presentation on the draft report of 2015 Collaborative Transmission Plan**
- Discuss potential study scope for 2016 studies**

➤ Operations Reliability Coordination Agreement (ORCA)

- Receive an update on the ORCA activities**



Questions ?





TAG
Open Forum Discussion

Comments or Questions?