

Agenda
Fall ITO Stakeholder Meeting
TranServ International, Inc. (TranServ)
Louisville Gas & Electric and Kentucky Utilities
Louisville, KY
Meeting Room Keeneland
9:00 AM
November 19, 2015

Dial in Access: 763-210-5070

Meeting ID: 3459

Password: 5547

Webcast Link: <http://meetingplace.oati.net/m/26C0CCD6561D4CD31C00329D0D56EB0AL1>

8:00 AM - 9:00 AM Breakfast (Gulfstream Hialeah Room)

Introduction & Overview - Mary Melvin (ITO)

- ITO Operations Report - Larry Monday (ITO)
- ITO System Impact & Generator Interconnection Studies - Mary Melvin

Reliability Coordinator Update - Nathan Schweighart (TVA)

- 2015 Construction Update - Delyn Kilpack (LG&E/KU)
- 2016 Transmission Expansion Plan Update - Delyn Kilpack
- 2016 Transmission Expansion Plan Assessment Status - Mary Melvin
- 2017 TEP Development Request for Stakeholder Input - Mary Melvin
- Status of Approval of Proposed GIC values - Mary Melvin
- Open Forum – Stakeholder Feedback & Wrap-up - Mary Melvin

Stakeholder Planning Committee (SPC) Meeting - Tim Lyons (OMU)

12:00 PM - 1:00 PM Lunch (Gulfstream Hialeah Room)

Network Operating Committee (NOC) Meeting - Ray Tompkins (LG&E/KU)

Transmission Owner Update - Ashley Moore (LGE/KU)

Adjourn

Louisville Gas & Electric and Kentucky Utilities Company

ITO Stakeholders Meeting

Hyatt Regency,
Louisville, Kentucky

November 19, 2015

Introduction and Overview

Mary Melvin, Manager Transmission Planning
TranServ

Introduction

- Those attending in person
 - Please silence cell phones
 - Those calling into the meeting
 - Please place your phone on mute
 - Do not put your phone on hold to answer another call
 - Introduction of Attendees
 - Attending in person
 - Calling into the meeting
-
-

Overview of Meeting

- ITO Operations Report
 - ITO System Impact & Generator Interconnection Studies
 - Reliability Coordinator Update
 - 2015 Construction Update
 - 2016 Transmission Expansion Plan Update
 - 2016 Transmission Expansion Plan Assessment Status
 - 2017 TEP Development Request for Stakeholder Input
 - Status of Approval of Proposed GIC values
 - Open Forum – Stakeholder Feedback & Wrap-up
 - Adjourn/Break
 - Stakeholder Planning Committee (SPC) Meeting
 - Noon - 1:00 Lunch (Gulfstream Hialeah Room)
 - Network Operating Committee (NOC) Meeting
 - Transmission Owner Update
-
-

ITO Stakeholder Meeting

Operations Report

Larry Monday, Manager, Tariff Services

November 2015

Summary of Operations

- For the period of June 2015 to October 2015
- Transmission Service Metrics
 - *Summary by Action*
 - *Summary by Point of Delivery (POD)*
 - *Summary by Service Type*
- Open Access Technology International, Inc. (OATI) webTrans and Open Access Same-Time Information System (OASIS) changes
- Summary of electronic tag actions
- Snapshot of a recent monthly Available Transfer Capability (ATC) posting
- Most limiting flowgates

Summary of Operations (Continued)

- Independent Transmission Organization (ITO)
Issue summary since last meeting
- Federal Energy Regulatory Commission (FERC)
Semi-Annual Report Operations Summaries
- Changes of Network Integration Transmission
Service (NITS) due to FERC Order 676-H

Transmission Service Metrics by Action

Transmission Service Metrics by Action June 2015 through October 2015				
	Non-Affiliate	%	Affiliate	%
APPROVED	759	87.4%	1274	86.4%
Accepted-Confirmed	672		1130	
Counteroffer-Confirmed	10		62	
Customer-Withdrawn	35		41	
Provider-Superseded	0		0	
Provider-Declined	0		0	
Provider-Retracted	38		36	
Provider-Annulled	4		4	
Provider-Displaced	0		0	
DENIED	86	9.9%	194	13.2%
Invalid	42		23	
Refused	43		171	
Declined	1		0	
Superseded	0		0	
WITHDRAWN	19	2.2%	6	0.4%
RECEIVED	0	0%	0	0.0%
TSR STUDY QUEUE	4	0.2%	0	0.0%
Put in Queue During Period	4		0	
In Queue from Previous Periods	0		0	
Total	868		1474	

Transmission Service Metrics by POD

Transmission Metrics Per Path June 2015 through October 2015					
POD	TOTAL	APPROVED	DENIED	WITHDRAWN	STUDY/RECEIVED
EEI	0	0	0	0	0
LGEE	274	231	40	2	1
MISO	580	513	59	8	0
OMU	212	164	46	2	0
OVEC	1	0	1	0	0
PJM	1179	1054	109	13	3
TVA	96	71	25	0	0
TOTAL	2342	2033	280	25	4

Transmission Service Metrics by Type

Transmission Metrics Per Service Type June 2015 through October 2015					
Service Type	TOTAL	APPROVED	DENIED	WITHDRAWN	STUDY/RECEIVED
Yearly Firm	17	4	8	1	4
Monthly Firm	5	4	1	0	0
Weekly Firm	7	3	4	0	0
Daily Firm	107	95	10	2	0
Monthly Non-Firm	0	0	0	0	0
Weekly Non-Firm	0	0	0	0	0
Daily Non-Firm	52	50	2	0	0
Hourly Non-Firm	2126	1850	254	22	0
Hourly Secondary	28	27	1	0	0
Total	2342	2033	280	25	4

OATI webTrans Changes

- OATI webTrans changes during the period
 - *Updated ratings as requested by Louisville Gas & Electric/Kentucky Utilities Services Company (LG&E/KU)*
 - *Updated flowgate ratings for #2808 and #17884 as requested by Tennessee Valley Authority (TVA)*
 - *Flowgate Transmission Reserve Margin (TRM) and Capacity Benefit Margin (CBM) updated*
 - *Add MISO flowgate #20957, #20958, and #20959 as requested by the Reliability Coordinator (RC)*
 - *Removed 2 LG&E/KU flowgates (#2297 and #2527) as posted on the OASIS*

OASIS Changes

- OASIS changes during the period
 - *Posted Transmission Rates as requested by the Transmission Owner (TO)*
 - *Posted outdated LG&E/KU load data under System Data*
 - *Posted new System Operating limits Methodology (SOL) Document in LG&E/KU OASIS*
 - *Posted an updated Operational LG&E/KU Open Access Transmission Tariff (OATT) document*
 - *Posted Preliminary 2016 Transmission Expansion Planning (TEP) Document in LG&E/KU OASIS*
 - *Posted 2015 Economic Planning Studies form in LG&E/KU OASIS*
 - *Posted updated LG&E/KU, KMPA, and EKPC Designated Network Resource (DNR) list*
 - *Posted Semi-Annual Report Statistics in LG&E/KU OASIS*
 - *Posted FERC Filing & OATT Amendment/ER15-2638-000 in LG&E/KU OASIS*
 - *Posted FERC Filing & OATT Amendment/ER16-2-000 in LG&E/KU OASIS*

OASIS Changes (Continued)

- *Posted GIC, DNR, and NITS capacity values in LG&E/KU OASIS*
- *Posted 2015 Spring Stakeholder meeting information documents in LG&E/KU OASIS*
- *Posted 2015 Spring Stakeholder minutes information documents in LG&E/KU OASIS*
- *Posted the LG&E List of Studies that is available on request is posted in LG&E/KU OASIS*
- *Posted NITS Application in LG&E/KU OASIS*
- *Posted notices for Clustering Window opening*

Summary of Electronic Tag Actions

Tag Statistics Provided by OATI webTag System

Aggregate Type: June 2015 Through October 2015

Time Zone: EST

Emergency Tags visible to:

Company	Type	Creation	Curtailment	Adjustment/Extension	Cancellation	Reload	Termination	Company Totals
LGEE	TSP	1	0	0	0	0	0	1

Requests actively approved by:

Company	Type	Creation	Curtailment	Adjustment/Extension	Cancellation	Reload	Termination	Company Totals
LGEE	TSP	3709	0	4810	26	0	4	8549

Requests actively denied by:

Company	Type	Creation	Curtailment	Adjustment/Extension	Cancellation	Reload	Termination	Company Totals
LGEE	TSP	5	0	8	0	0	0	13

Requests visible to:

Company	Type	Creation	Curtailment	Adjustment/Extension	Cancellation	Reload	Termination	Company Totals
LGEE	TSP	3714	100	4818	26	6	4	8668

Visible-type tags that required no action by the TO, and instead required only action by the RC.

Snapshot of Monthly Export ATC

Percentage of Time Monthly Firm Available for Export

Source – October 30, 2015 ATC Posting

Export Source	EEI	LGEE	MISO	OMU	OVEC	PJM	TVA
BLGR	NA	76%	76%	53%	76%	76%	35%
EEI	NA	0%	NA	18%	12%	18%	NA
KMPA	NA	6%	53%	59%	6%	47%	59%
LGEE	35%	76%	76%	65%	76%	65%	41%
MISO	NA	59%	NA	94%	NA	NA	100%
OMU	41%	35%	76%	NA	53%	29%	41%
OVEC	88%	94%	88%	88%	NA	NA	88%
PJM	76%	94%	NA	76%	NA	NA	53%
TVA	100%	94%	76%	100%	76%	76%	NA
GRIVER	NA	76%	100%	76%	76%	12%	59%

Percentage of Time Monthly Firm Available for Export

Source – June 30, 2015 ATC Posting

Export Source	EEI	LGEE	MISO	OMU	OVEC	PJM	TVA
BLGR	NA	53%	53%	35%	53%	53%	35%
EEI	NA	0%	NA	0%	0%	0%	NA
KMPA	NA	53%	47%	53%	47%	47%	35%
LGEE	35%	82%	53%	53%	53%	41%	35%
MISO	NA	71%	NA	53%	NA	NA	71%
OMU	29%	53%	53%	NA	53%	35%	35%
OVEC	71%	100%	82%	53%	NA	NA	71%
PJM	65%	82%	NA	47%	NA	NA	53%
TVA	82%	53%	53%	53%	53%	53%	NA
GRIVER	NA	41%	41%	53%	41%	29%	29%

Snapshot of Export Limiting Flowgates

- Export Limiting Flowgates from Generation located in LG&E/KU
 - *TRMCLFROCJEF*
 - *BUKMIDTRMCLF*
 - *SMIGRSMIXFM*

Snapshot of Monthly Import ATC

Percentage of Time Monthly Firm Available for Import to Network Load

Source – October 30, 2015 ATC Posting

Network Load	Bluegrass	EEI	KMPA	LGEE	MISO	OMU	OVEC	PJM	TVA	GRIVER
EKPC[PJM]	76%	18%	47%	65%	0%	29%	0%	0%	76%	12%
LGEE/KMPA/BEN	76%	0%	6%	76%	59%	35%	94%	94%	94%	76%
OMU	53%	18%	59%	65%	94%	0%	88%	76%	100%	76%
TVA	35%	0%	59%	41%	100%	41%	88%	53%	0%	59%

Percentage of Time Monthly Firm Available for Import to Network Load

Source – June 30, 2015 ATC Posting

Network Load	Bluegrass	EEI	KMPA	LGEE	MISO	OMU	OVEC	PJM	TVA	GRIVER
EKPC[PJM]	53%	0%	47%	41%	NA	35%	NA	NA	53%	29%
LGEE/KMPA	53%	0%	53%	82%	71%	53%	100%	82%	53%	41%
OMU	35%	0%	53%	53%	53%	0%	53%	47%	53%	53%
TVA	35%	0%	35%	35%	71%	35%	71%	53%	0%	29%

Snapshot of Import Limiting Flowgates

- Most limiting flowgates for each Network Customer
 - *EKPC – TRMCLFROCJEF*
 - *LGEE/KMPA/BEN – BUKMIDTRMCLF*
 - *OMU – GRSSMIMIXFM*

TranServ Help Desk Tickets	
Created For	Number of Tickets
OATT Customers	21
LG&E/KU Transmission Owner	26
TVA Reliability Coordinator	3
Internal TranServ Requests	109
Total for Period	159

Recurring Unused Transmission Service Reservations under the LG&E/KU OATT
Reservations that were unscheduled, or scheduled less than 10% of available for more than 1 Month
for Months of March 2015 to August 2015

Aref	Customer	POR	POD	StartTime	StopTime	TSClass	TSType	Increment	Request Type	Year	Month	Energy Avail	Energy Unused	Capacity	Percent Unscheduled
73671359	IMEA	LGEE	PJM	20100601	20350601	FIRM	PTP	YEARLY	ORIGINAL	2015	3,4,5,6,7,8	2160	13248	3	100

Tariff Operations (Continued)

- September 2014 through February 2015 Redirect Report (count of occurrences)

Count of Redirect Path POD				Redirect Path POD				Grand Total
Cust	Original Incre	Original TSR	Original Path POD	MISO	PJM	TVA	LGEE	
LGE	DAILY	80904324	LGEE	1	1			2
		80904354	LGEE		2			2
		80912706	LGEE			4		4
		80980542	LGEE			2	1	3
		80980543	LGEE			1	1	2
	YEARLY	78542119	PJM	15	1	12	5	33
	MONTHLY	80595946	LGEE			8		8
Grand Total				16	19	14	5	54

- Full reports are posted on OASIS under the Stakeholder Information folder

FERC Order 676-H Updates

- November Workshop: 11/09/2015 and 11/10/2015
 - *Transmission Provider (TP) planning*
 - *Business Process Review*
 - *First look at the new webSmartOASIS and webTrans NITS display*
- December/January Information Sessions: 12/14/2015 and 01/13/2016
 - *What to expect during the NITS roll-out*
 - *Informational Guides and resources*
 - *Project Delivery dates*
- February Training: 02/15/2016 – 02/25/2016
 - *Data uploads*
 - *TP Business Processes*
 - *End User mechanics*

- 676-H NITS Timeline
 - **01/28/2016** - Release of Demo webSmartOASIS NITS and webTrans Changes to Demo systems
 - **01/31/2016** - webSmartOASIS Production Release
 - **02/01/2016 – 02/29/2016** - OATI is providing training to TPs
 - ITO is planning on providing training tentatively between February 2016 and March 2016
 - **03/01/2016** - Release of Production webSmartOASIS NITS and webTrans Changes to Production Environment begins
 - **04/24/2016** - Standard compliance date

- OATI NITS Development Progress
 - *Development of the initially scoped webOASIS NITS changes are 91% completed*
 - *webOASIS Development requires 26 new Application Programming Interface (API) templates and 32 new displays*
 - *NITS changes will be available for Customer Testing on the webOASIS Demo system in January 2016*

- Key Concepts
 - *All actions for NITS are in the form of “requests”*
 - *Confirmed “requests” will be reflected in updates to the customer’s NITS Application*
 - *Each individual NITS request will have an Assignment_Ref*
 - *Each NITS Application will have an Application_Ref*
- Key NITS Model Elements
 - *NITS Application*
 - *Loads*
 - *Generation*
 - *Resources*
 - *DNRs*
 - Scheduling Rights
 - DNR to load 1:1 ratio is not enforced
 - *Secondary Network Resources (6NN)*

- NITS Data Migration on OASIS
 - *ITO will begin the NITS migration process to the new standard sometimes in March 2016*
 - *Each existing Network Customer will have its own NITS Application on the OASIS*

- *Existing network services and DNRs will be migrated to the new NITS module*
- *Existing network services will be recalled by the ITO*
- *These are the available NITS data templates for new Network Service Requests*
 - NewNITSApplication
 - AddNITSAgent
 - AddNITSLoad
 - AddNITSGeneration
 - AddNITSResource
 - AddNITSDNR
 - TerminateNITSDNR
 - AddNITSSecondary
 - TerminateNITSSecondary

Questions

Thank You

Larry Monday
Support@transervinternational.net
763.205.7099

ITO Stakeholders Meeting

ITO Transmission Service Request Study Queue and Statistics

Mary Melvin, Manager, Transmission Planning

November 2015

- Study Metrics for Quarter 3, 2015
 - Transmission Service Request (TSR) Studies in progress as of October 31, 2015
-
-

- 2015 Quarter 3
 - *System Impact Study*
 - New System Impact Study Agreement Delivered – 5
 - New System Impact Study Agreement Executed – 4
 - System Impact Study Withdrawn – 1
 - System Impact Study Completed – 4
 - System Impact Study Completed Late – 0
 - *Facilities Study*
 - New Facility Study Agreement Delivered – 1
 - New Facility Study Agreement Executed – 2
 - Facility Study Withdrawn – 0
 - Facility Study Completed – 3
 - Facility Study Completed Late – 0
-
-

- Studies completed since Quarter 3, 2015
 - *System Impact Study for LGE-2015-014 TSR #81430440*
 - System Impact Studies In-Progress as of October 31, 2015
 - *System Impact Study for LGE-2015-015 TSR #81599733*
 - *System Impact Study for LGE-2015-016 TSR #81748926*
 - Facilities Studies In-Progress as of October 31, 2015
 - *LGE-2015-002 TSR #80661560 - TO is performing a Facilities Study Modification under OATT section 19.6.*
-
-

- Effective August 28,2015
 - *SIS and FS Reports*
 - *Executive Summaries posted on OASIS (no CEII Information)*
 - *Transmission Service Information => System Impact Study Report*
 - *Transmission Service Information => Facilities Study Report*
 - *Complete Report*
 - *Contains CEII*
 - *Available on the secure LG&E and KU CEII FTP site*
 - <https://eft.lge-ku.com/EFTClient/Account/Login.htm>

Thank You

Mary Melvin
mary.melvin@transervinternational.net
763.205.7086

Projects Completed by October 2015

Project No.	Description	Comments
543	Replace the 954 ACSR line riser at Lake Reba Tap associated with the Lake Reba Tap to JK Smith 138 kV line to 1590 MCM 54X19 ACSR or equivalent.	Completed in May 2015
774	Increase the MOT of the 397.5 MCM 26X7 ACSR conductor(1.37 mi., 165F) in the Richmond – Richmond 2 section of the Richmond - Okonite 69 kV line to 212F.	Completed in May 2015
1048	Close 161 kV interconnection between Matanzas and the BREC New Hardinsburg - Paradise 161 kV line. This project will require only closing the breaker at Matanzas and testing	Completed in May 2015
1045	Build a 345kV switching station in New Albany, IN connecting LG&E's Paddys West-Northside 345kV and DEM's Speed-Ramseys 345kV lines.	Completed in May 2015
786	Add Cane Run 7 NGCC and associated 138 kV interconnection facilities. Retire Cane Run units 4, 5 & 6.	Completed in June 2015
787	Tap the Mill Creek - Paddys West 345 kV line and construct a 345 kV tap line to the new Cane Run NGCC (CR7) substation at the Cane Run Plant site. Install a 450 MVA, 345/138 kV transformer at Cane Run.	Completed in June 2015
878	Replace wavetrap at Livingston in Livingston-Crittendon 161 kV	Completed in August 2015
879	Install 2.5% reactor at Livingston in Livingston-N. Princeton 161 kV.	Completed September 2015
804	Increase the MOT of the 397.5 MXM 26X7 ACSR conductor in the Bond to Virginia City 69 kV line to minimum ratings as follows: Bond - Tom's Creek 180 deg. F, Tom's Creek - Sandy Ridge 190 deg. F, Sandy Ridge - Virginia City 195 deg. F.	Completed in September 2015
776	Increase the MOT of the 2/0 7X CU conductor (0.11 mi.) in the Scott St. Tap - Scott St. 4 kV section of the Scott Street Tap 69 kV line, to a minimum of 176 deg.F.	Completed in December 2014
1051	Add redundant protection system to the Brown CT 138 kV bus or change the delayed clearing timefor Brown CT/Brown N/Brown Plant 138 kV (227-704) circuit with remote Brown North 152-784 open 18.8 cycles for a bus differential fault on the Brown CT 138 kV bus. Project became the reduced clearing time.	Completed in September 2015
686	Removal of Northside/Speed reactor.	Completed August 2015

Projects Under Construction

Project No.	Description	Status
842	Replace the 69kV terminal equipment less than 1200A associated with Cane Run Switching 138/69 kV transformer #1 with 2000 amp or better equipment.	This project replaced with less expensive project #432 - Project #432 will be done earlier than originally planned so that #842 will not be required
393	Replace 69 kV terminal equipment rated less than or equal to 993 Amps (119 MVA) summer emergency ratings associated with the Ashbottom to South Park 69 kV line or winter emergency rating capable of a minimum of 1112 Amps (133 MVA).	Project eliminated after further analysis
317	Replace the 1.81 miles of 397 kCM ACSR in the Farley to US Steel section of the Farley to Sweet Hollow 69kV line with 556 kCM ACSR or equipment capable of at least 820A (98 MVA) summer emergency.	Expect Completion December 2015
709	Increase the 600A setting of the breaker CT associated with breaker 137-624 on the Garrard CT to Lancaster KU 69kV line to 1200A.	Expect Completion June 2016
849	Install a 345 kV breaker at West Lexington on the Brown N to West Lexington section of the Brown N to West Lexington to Ghent 345 kV line	Expect Completion November 2015
432	Close the Cane Run Switching-Mill Creek 69 kV line by installing a 69kV breaker between West Co MSD #1 and #2	Expect completion June 2016
448	Replace the 1590 MCM ACSR terminal equipment associated with breaker 117-754 at Brown Plant on the Brown Plant to Brown CT to Brown North 138 kV line with bundled 1590 MCM ACSR conductors	Expect completion September 2016
524	Replace the 500 kCM CU terminal equipment and bus at Hardinsburg associated with breaker 184-724 (Hardinsburg-Central Hardin 138 kV) with 750 kCM CU equipment.	Expect completion September 2016
851	Normally open Finchville to Southville 69kV	Expect completion November 2015
1049	Add redundant protection system to bus differential at Cane Run Switching 138 kV bus	Expect completion June 2017
1050	Add redundant protection system to Brown Plant 138 kV bus or reduce back up clearing time on both Brown Plant - West Cliff 138 kV lines to 25 cycles.	Expect completion June 2017
1052	Add redundant protection system to Brown North 138 kV bus fault	Expect completion June 2017
1053	Add redundant protection System for a bus differential fault on the Ghent 345 kV bus	Expect completion December 2018
866	Replace the 600 amp hooksticks at West Cliff on the West Cliff to Shakertown 69kV line with 1200 amp equipment.	Expect Completion June 2016
809	Increase the MOT of the 397.5 MXM 26X7 ACSR conductor in the Corydon - Highland Mine 69 kV section of the Corydon - Morganfield 69 kV line to a minimum rating of 176 deg. F. (Currently at 160 deg. F, 3.46 miles)	Expect completion May 2016
863	Upgrade the MOT of the 397.5 ACSR 26X7 conductor (0.21 mi.) to a minimum of 130 deg. F, in the South Paducah to KY Dam 69 kV line.	Expect completion May 2016
770	Increase the MOT of the 397.5 MCM 26X7 ACSR conductor (0.6 mi.) in the Marion - Marion South section of the Princeton - Crittenden County 69 kV line, to a minimum of 140F.	Expect completion May 2016

Project No.	Description	Status
883	Replace breakers MT-3870 and MT-69KV TR 1 at Middletown, with equipment having a 63 KA duty rating.	Expect completion October 2016
1057	Confirm or shorten the clearing time to 15 cycles if there is a Single-phase-to-ground fault on Ghent – Trimble 345kV line (close in on Ghent 345kV bus) and breaker 165-932 fails to open.	Expect completion December 2015



PPL companies

2016 Transmission Expansion Plan (TEP)

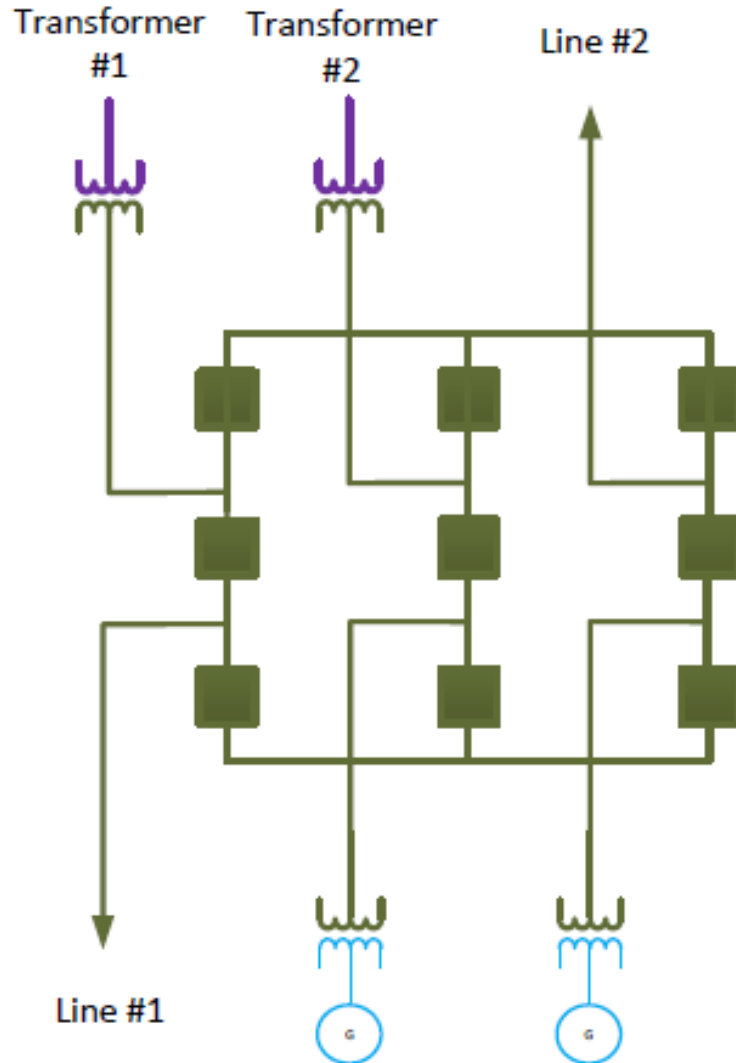
November 19, 2015 Stakeholder Meeting



Summary of New 2016 Projects

- Five New Protection and Control Projects
 - *TPL-001-4 Required Stability Load Inductor Model*
 - *GIC (Generation Interconnection Capacity) levels studied*
- 17 New 69 kV Rating Increase Projects summing to 79 miles
- 2 New BES Rating Increase Projects summing to 9.6 miles
- 6 New substation terminal equipment replacements

Example Showing Redundant Bus Differential Relay



Protection Projects

- Redundant Bus Differential Relay at Ghent and Trimble County; Trimble Co is for GIC only
 - *Last year there were three redundant bus differential relays at Cane Run Switching, Brown North and Brown Plant.*
- Delay automatic high speed reclosing to one second
- Shorten delayed clearing time on Ghent – Trimble 345 kV will be complete in December 2015
- Shorten clearing time on Brown 345/138 transformer

TSR Identified Projects

- As requested in a previous stakeholder meeting, the projects identified in TSR studies are included in a separate attachment.

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
709	Upgrade terminal equipment at Lancaster 137 associated with the Lancaster to Garrard CT 69 kV line rated less than or equal to 845 Amps (101 MVA) winter emergency to a minimum rating of 1071 Amps (128 MVA) winter emergency.	10/31/2015
851	Normally open Finchville to Southville 69kV	11/1/2015
317	Replace the 1.81 miles of 397 kCM ACSR in the Farley to US Steel section of the Farley to Sweet Hollow 69kV line with 556 kCM ACSR or equipment capable of at least 820A (98 MVA) summer emergency.	12/31/2015
761	Increase the MOT of the 3/0 6X1 ACSR conductor (10.12 mi. @ 120 F), in the Science Hill to Floyd Tap to Waynesburg 69 kV line to a minimum thermal rating of 130 F.	5/30/2016
770	Increase the MOT of the 397.5 MCM 26X7 ACSR conductor (0.6 mi.) in the Marion - Marion South section of the Princeton - Crittenden County 69 kV line, to a minimum of 140F.	5/30/2016
809	Increase the MOT of the 397.5 MXM 26X7 ACSR conductor in the Corydon - Highland Mine 69 kV section of the Corydon - Morganfield 69 kV line to a minimum rating of 176 deg. F. (Currently at 160 deg. F, 3.46 miles)	5/30/2016
863	Upgrade the MOT of the 397.5 ACSR 26X7 conductor (0.21 mi.) to a minimum of 130 deg. F, in the South Paducah to KY Dam 69 kV line.	5/30/2016

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
866	Replace 69kV terminal equipment rated less than or equal to 806 Amps (96 MVA) winter emergency rating associated with the West Cliff to Shakertown 69kV line with equipment capable of a minimum of 1330 Amps (159 MVA) winter emergency rating.	5/30/2016
849	Install a 345 kV breaker at West Lexington on the Brown N to West Lexington section of the Brown N to West Lexington to Ghent 345 kV line	5/30/2016
883	Replace breaker MT-3870 at Middletown, with equipment having a 63 KA duty rating.	5/31/2016
432	Close the Cane Run Switching-Mill Creek 69 kV line by installing a 69kV breaker between West Co MSD #1 and #2 with equipment capable of a minimum rating of 840 Amps (100 MVA) summer emergency.	6/1/2016
448	Replace the 138 kV terminal equipment rated less than or equal to 1,704 Amps (407 MVA) Summer emergency rating associated with breaker 117-754 at Brown Plant associated with the Brown Plant to Brown CT to Brown N 138 kV line with equipment capable of a mi	11/30/2016
1052	Add redundant protection system to Brown North 138kV bus faults.	5/1/2017
200	Increase the MOT of the 636 MCM 24X7 ACSR conductor to minimum 190 deg. F, and increase the MOT of the 795 AA to a minimum 176 deg. F, in the Oxmoor to Breckenridge 69 kV line (6653).	5/30/2017

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
750	Increase the MOT of the 556.5 MCM 26X7 ACSR conductor (11.82 mi. @ 130F) in the Campground Junction - Emanuel Tap section of the Bimble - London 69 kV line, to a minimum of 140F.	5/30/2017
759	Increase the MOT of the 795 MCM 26X7 ACSR conductor (1.73 mi., at 145F) in the Floyd - Hancock Tap section of the Floyd - Clay 69 kV line, to a minimum of 155F.	5/30/2017
837	Upgrade the MOT of the conductors in the 6676 North Tap to South Park 69 kV section of the Mud Lane to Blue Lick/South Park 69 kV line (795 MCM 61XAA (1.78 mi.) and 840.2 MCM 24X13 ACAR (0.21 mi.)) to 212F.	5/30/2017
840	Increase the MOT of 1.15 miles of 795 MCM 26X7 ACSR conductor to a minimum of 190°F and replace 0.61 miles of 795 MCM 61X AA conductor with ACSR, in the Canal to Madison 69 kV line.	5/30/2017
862	Increase the MOT of the 266.8 Conductor to 165F in the Waitsboro to Union Underwear section of the Somerset EKPC to Russel Co EKPC 69 kV line	5/30/2017
1049	Add redundant protection system to bus differential at Cane Run Switching 138 kV bus.	5/30/2017
1054	Disable reclosing on multiple lines throughout the system to remove angular and voltage instability.	5/30/2017

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
1056	Confirm or shorten the clearing time to 15 cycles if there is a Single-phase-to-ground fault on the Brown 138/345kV transformer and breaker 152-708 fails to open.	5/30/2017
408	Increase the MOT of the 336.4 MCM 19X AA conductor in the Ethel to Nachand 69 kV line (circuit 6670) to 212 deg. F.	5/30/2017
1057	Confirm or shorten the clearing time to 15 cycles if there is a Single-phase-to-ground fault on Ghent – Trimble 345kV line (close in on Ghent 345kV bus) and breaker 165-932 fails to open.	5/30/2017
1059	Take circuit 4541 circuit out of service no later than 20 cycles after fault occurs; if there is a Bus differential failure (Single-line-to-ground) with protection failure on Trimble County 345kV bus.	5/31/2017
75	Replace 69kV equipment rated less 690 amps summer emergency at Boyle Co associated with the Boyle Co to Lancaster 69kV line (breaker 101-604) with equipment capable of a minimum of 993 amps summer emergency.	11/30/2017
648	Construct a second Elizabethtown - Hardin Co 138 kV circuit by overbuilding the existing Elizabethtown - Hardin Co 69 kV line. Build 138kV line terminals at both Elizabethtown and Hardin Co with of a minimum of 1108 Amps summer and 1490Amps winter emergen	11/30/2017
667	Replace 138kV terminal equipment rated less than or equal to 1200 Amps (287 MVA) winter emergency rating associated with the Hardinsburg to Black Branch 138kV line with equipment capable of a minimum of 1363 Amps (326 MVA) winter emergency rating.	11/30/2017

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
845	Replace 2.86 miles of 266.8 MCM 26X7 ACSR conductor in the Adams - Delaplain Tap section of the Adams - Oxford 69 kV line. Use 397.5 MCM 26X7 ACSR or better.	11/30/2017
865	Replace 69kV terminal equipment rated less than or equal to 600 Amps (72 MVA) winter emergency rating associated with the Bonds Mill to Lawrenceburg Tap 69kV line with equipment capable of a minimum of 806 Amps (96 MVA) winter emergency rating.	11/30/2017
876	Install a 69 kV, 21.6 MVAR capacitor bank at the KU Vine Grove station.	11/30/2017
881	Replace the 161kV terminal equipment rated equal to or less than 1200 amps WE at Elihu associated with breaker (096-814) on the Elihu to Alcalde 161 kV line with equipment capable of a minimum of 1363.	11/30/2017
1053	Fully redundant relay for a bus differential fault on the Ghent 345 kV north bus.	11/30/2017
94	Increase the MOT of 1.56 miles of 636 ACSR conductor (176F) in the Mud Lane to Smyrna 69 kV line to 212F.	5/30/2018
136	Reconductor the 2/0 7X CU (10.37 mi) with 397.5 MCM 26X7 ACSR or better in the in Clay Village Tap to West Frankfort section of the Shelbyville to West Frankfort 69 kV line.	5/30/2018

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
292	Construct 1.6 mi of 69 kV line from Ewington to AO Smith using 397 MCM 26X7 ACSR. Operate Ewington and AO Smith radially from Spencer Road. Increase the MOT of the 397.5 MCM 26X7 ACSR in the Spencer Road to Ewington 69 kV line to a minimum of 176 deg.	5/30/2018
299	Replace the existing 138/69kV, 33 MVA transformer at Spencer Rd. Planning determined a minimum transformer with top nameplate rating of 90 MVA using 8% impedance based on that rating. Also, replace the associated 69kV terminal equipment rated equal to or	5/30/2018
654	Increase the MOT of the 556 ACSR conductor in the Dix Dam to Buena Vista section of the Dix Dam to Lancaster 69 kV line to 212 deg. F.	5/30/2018
705	Install a 161 kV breaker on the Morganfield 161/69 kV transformer with minimum ratings of 462 amps SE and 542 amps WE.	5/30/2018
756	Increase the MOT of the 397.5 MCM 26X7 ACSR conductor (2.27 mi. @ 125°F) in the Clinton - Clinton 581 section of the Clinton - Wickliff 69 kV line, to a minimum of 135 deg.F.	5/30/2018
796	Replace 5.19 miles of 795 MCM 26X7 ACSR conductor in the West Lexington - Viley Road section of the West Lexington - Viley Road - Haefling 138 kV line, using high-temperature conductor capable of at least 1500 A.	5/30/2018
659	Rebuild the 3.37 miles of 795 MCM AA in the Aiken to Eastwood West section of the Aiken to Eastwood to WHAS 69kV line using 954 MCM ACSR.	5/30/2019

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
733	Replace the 69kV terminal equipment rated equal to or less than 1062 amps SE associated with the Collins 138/69 kV transformer with equipment capable of a minimum 1434 amps SE.	5/30/2019
797	Replace 7.34 miles of 795 MCM 26X7 ACSR conductor in the West Lexington - Haefling 138 kV line, using high-temperature conductor capable of at least 1500 A.	5/30/2019
836	Rebuild Horse Cave Tap to Horse Cave 69 kV circuit using 795 MCM 26X7 ACSR or better, and replace terminal equipment rated equal to or less than 600 amps SN with equipment capable of a minimum of 1200A SN.	5/30/2019
867	Replace the 138kV terminal equipment rated less than 100 amps SE at Haefling associated with the Haefling to Viley Road section of the West Lexington to Viley Road to Haefling 138 kV line with equipment capable of a minimum of 1200 amps SE.	5/30/2019
884	Install a 130 MVAR, 161 kV shunt reactor on the Alcalde 161 kV bus. Please NOTE, this is a preliminary corrective plan and may not be the final solution for this violation.	5/30/2019
1050	Add redundant protection system to Brown Plant 138kV bus or reduce back up clearing time on both Brown Plant-West Cliff 138 kV lines to 25 cycles	5/30/2019
43	Increase the MOT of the 556.5 ACSR conductor in the Earlington North to Madisonville So Jct section of the Earlington North to Green River 69 kV line to 212F.	5/30/2020

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
96	Reconductor 1.87 miles of 397.5 kCM ACSR in the Lansdowne to Wilson Downing tap section of the Higby Mill to Lansdowne 69 kV line with 795 kCM ACSR conductor.	5/30/2020
216	Replace the 1272 AA conductor (1.57 mi.) in the Plainview tap to Plainview section of the Middletown to Beargrass 138 kV line with 1272 ACSR.	5/30/2020
302	Reconductor the Higby Mill to Wilson Downing tap section of the Higby Mill to Lansdowne 69 kV line (1.66 miles). This line needs to be capable of 1200A SE (954 kcm ACSR).	5/30/2020
524	Replace 138kV terminal equipment rated less than or equal to 993 Amps (237 MVA) summer emergency rating associated with the Hardinsburg to Black Branch 138kV line with equipment capable of a minimum of 1109 Amps (265 MVA) summer emergency rating.	5/30/2020
721	Increase the MOT to 212F of the 397.5 kCM 26X7 in the Madisonville East-Hanson Tap section of the Madisonville 69 kV loop circuit (0.94 miles).	5/30/2020
882	Replace the 69 kV terminal equipment rated less than or equal to 791 Amps (95 MVA) summer emergency rating associated with the Watterson #1 138/69 kV transformer capable of a minimum of 1062 Amps (127 MVA) summer emergency rating.	5/30/2020
893	Increase the MOT of the 397.5 ACSR conductor in the Madisonville Hospital to Hanson Junction on the Madisonville loop from 155F to 165F (0.06 mi)	5/30/2020

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
896	Increase the MOT of the 397.5 ACSR conductor in the Morganfield 4 to Wheatcroft tap section of the Morganfield to Nebo 69 kV line from 125F to 135F (14.90 mi)	5/30/2020
888	Replace the 69kV terminal equipment rated less than 810 amps WE associated with breaker 108-634 at Adams on the Adams to Delaplain tap 69 kV line with equipment at minimum capable of 900 amps winter emergency rating.	11/30/2020
416	Increase the MOT of the 392.5 ACAR in the Upper Mill Creek-Riverport 69 kV line section (circuit 6678) to 212°F (2.8 mi).	5/30/2021
571	Increase the MOT of 3/0 6X1 ACSR conductor in the Mt Washington tap to Fairmount (6662) tap section of the Blue Lick to Watterson 69 kV line to 212F (3.7 mi).	5/30/2021
694	Replace the 69 kV terminal equipment rated equal to or less than 688 amps SE at Georgetown with equipment capable of a minimum of 992 amps SE, and increase the MOT of the 556.5 ACSR line conductor in the Adams to Georgetown section of the Adams to Haeflin	5/30/2021
885	Reconductor 2.67 miles 397.5 MCM 26X7 ACSR conductor in the Shakertown to West Cliff section of the West Cliff to Bonds Mill 69 kV line using 795 MCM 26X7 ACSR conductor.	5/30/2021
889	Increase the confirmed MOT of the bundled 795 ACSR in the Ashbottom to Cane Run Switch 138 kV line from 150 F to 155F (8.04 mi)	5/30/2021

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
891	Increase the MOT of the 397.5 ACSR conductor in the Crittenden to Marion S 69 kV from 140F to 150F (1.56 mi)	5/30/2021
624	Increase the MOT (556.5 MCM 26X7 ACSR 176/176F 0.83 mi.) of the Ferguson South - Somerset KU 69 kV section of the Elihu to Somerset KU 69 kV line (96-604) to 212F.	5/30/2022
898	Replace the 138 kV terminal equipment associated with Paddys Run 138/69/14 KV TR 3-A rated less than 717 Amps SE using equipment rated at least 900 Amps SE.	5/30/2022
646	Change the 800A CT settings on breakers 96-608 and 96-618 associated with the 161/69 kV transformers at Elihu to 1200A.	11/30/2022
901	Replace the 600A hook stick disconnects (068-614B and 068-614L) associated with breaker 068-614 (Bonds Mill - West Cliff 69 kV line), using equipment capable of 1200A or more.	11/30/2022
593	Re-conductor 1.33 mi of the 4/0 Cu conductor (1.33 mi., 176F) in the Magazine - Algonquin 69 kV line with 397.5 ACSR.	5/30/2023
872	Reconductor the 2/0 7X CU 3.84 mi with 397.5 MCM 26X7 ACSR or better in the Clay Village Tap to Shelbyville East section of the Shelbyville to West Frankfort 69 kV line.	5/30/2023

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
890	Increase the MOT of the 954 ACSR conductor in the Boonesboro N to Boonesboro Park 69 kV line from 125F to 130F (0.21 mi)	5/30/2023
894	Increase the MOT of the 397.5 ACSR in the Hardesty A to Princeton section of the Princeton to Walker 69 kV line from 130F to 140F (15.12 mi)	5/30/2023
214	Install a 69 kV, 26.4 MVAR capacitor bank at the KU Hodgenville #744 station.	11/30/2023
663	Replace existing 69 kV terminal equipment rated 1556 amps or less WE associated with the Elizabethtown 138/69 kV transformer with equipment capable of 1683 amps WE.	11/30/2023
728	Reconductor 1.6 miles of 795 MCM 61X AA conductor in the Worthington - 6659 Tap section of the Worthington - Freys Hill 69 kV line using 795 MCM 26X7 ACSR.	5/30/2024
734	Increase the MOT to 212F of the 795 kCM 45X7 ACSR (5.02 mi.) in the Taylor to Harrods Creek 69 kV line.	5/30/2024
887	Increase the MOT of the 12.46 mi of 397.5 ACSR in the Kentucky Dam (TVA) to Eddyville Prison tap 69 kV line to 212F	5/30/2024

Transmission Expansion Plan

Project Number	Description	Projected In-Service Date
895	Increase the MOT of the 397.5 ACSR in the Hardesty A to Walker section of the Princeton to Walker 69 kV line from 130F to 140F (7.94 mi)	5/30/2024
902	Increase the MOT of the 397.5 MCM 26X7 ACSR conductor (6.28 mi.) in the Marion - Mexico section of the Princeton - Crittenden County 69 kV line, to a minimum of 140F.	5/30/2024
76	Replace the 795 AA conductor in the Ford to Ford tap section of the Worthington to Freys Hill to Ford Tap to Ford 69 kV line with 795 ACSR 26X7, rated at 212F.	5/31/2024
903	The NITS Capacity sensitivity results indicated a potential Need Date of 5/30/2018. This potential constraint can be mitigated by reducing generation at Paddys Run 13 and replacing it with Brown CT generation.	NA
904	The NITS Capacity sensitivity results indicated a potential Need Date of 5/30/2025. This potential constraint could be mitigated by reducing Brown CT generation and replacing it with Trimble County CT generation.	NA
905	The NITS Capacity sensitivity results indicate a potential Need Date of 5/30/2025. This potential constraint could be mitigated by reducing Brown CT generation and replacing it with Trimble County CT generation.	NA
906	The NITS Capacity sensitivity results indicate a potential Need Date of 5/30/2025. This potential constraint could be mitigated by reducing Brown CT generation and replacing it with Trimble County CT generation.	NA

ITO Stakeholder Meeting

2016 TEP Assessment Status

Mary Melvin, Manager, Transmission Planning

November, 2015

Summary of Topics

- Availability of 2016 Transmission Expansion Plan (TEP)
 - 2016 TEP Assessment Status
-
-

- Notification of OASIS posting
 - *Sent to all Stakeholders*
 - *Posted Date – October 30*
 - Oasis link for 2016 TEP posting
 - https://www.oasis.oati.com/LGEE/LGEEdocs/Study_Posting_CELL_Notice.pdf
-
-

- Summary of ITO Assessment
 - Planning Guidelines Review
 - Model and Input File Review
 - ITO Independent Analysis
 - Highlights of ITO 2016 TEP Preliminary Assessment
 - Schedule for Approval of 2016 TEP
-
-

- *Most Notable Changes effective October 15, 2015*
 - *Added NITS Capacity Sensitivity*
 - *Build for system intact conditions*
 - *Operating guides for P1-P7 contingency conditions*
 - *Modified TSR Sensitivity for Long-Term Firm TSRs*
 - *Build for TSRs of at least 5 years duration.*
 - *Operating guides for TSRs of less than 5 years duration (1-5 years)*
 - *Added Analysis for loss of non-affiliated Generation*
 - *Build to compensate for loss from associated sources and external sources*
 - *Removed Flowgate Analysis*
 - *Stability Models changed to Inductive Motor Load models*
 - *Power System Stability tested only after 4 seconds after a fault is cleared*
 - *Modified Minimum Transient Voltage and Rotor Angle Criteria*
-
-

- A new more Iterative Approval Process
 - BCS, Preliminary TEP, Final TEP, Preliminary Stability, Final Stability
 - ITO provided model and input file comments to LKE
 - LKE made adjustments to initial models and input files to accommodate ITO comments
 - ITO made some modifications to models and input files which were used in the Independent ITO analysis if LKE adjustments were not made
 - Model and Input File Review
 - Topology modeling consistent with the applicable expansion plan
 - Generation modeling consistent with GO provided and posted information
 - Transaction Modeling includes all appropriate TSRs
 - Load modeling consistent with LSE provided information
 - Input files consistent with planning guidelines
-
-

ITO Independent Analysis

- A new more Iterative Approval Process
 - *Preliminary TEP, Final TEP, Preliminary Stability, Final Stability*
 - *ITO Perform Independent ITO analysis*
 - *ITO modified Models and Input Files*
 - *LKE provides results and conclusions (projects)*
 - ITO Reviewed LKE results and conclusions (projects)
 - ITO Verified TO results and conclusions were consistent with planning guidelines
 - When differences were found ITO provided results and conclusion comments to LKE
 - LKE provided explanations for some differences
 - LKE made adjustments to accommodate some ITO comments
-
-

- **Preliminary ITO assessment results indicate:**
 - The 2016 TEP projects will mitigate all planning guideline criteria violations within the study horizon
 - Some analysis still underway
 - A listing of projects identified in TSR SIS is appropriately included in the 2016 TEP Report
 - ITO verified that all projects are included as listed in SIS
 - Draft TEP report requires some revision to eliminate inconsistencies in identifying the 2016 TEP (Att 12 vs Att 14)

Continued on next slide

- **Preliminary ITO assessment results indicate:**
 - There are several new projects due to stability issues
 - These stability issues are due to new dynamic load modelling
 - ITO and TO are currently discussing appropriate project need dates
 - Some interim mitigation plans are identified, ITO is working with TO to include remaining interim mitigations
 - The TEP process could be improved by finalizing Planning Guideline Changes earlier in the process

Schedule for Approval of 2016 TEP

- Nov 2014 – Request input from Stakeholders for 2016 TEP
 - Oct to Dec 2014 – Review Data provided for inclusion into TEP
 - Jan to Jun – Review various versions of Preliminary TEP Steady-State Models and Steady-State TEP Analyses
 - May to Sept – Review various versions of TEP Stability Models
 - Jun to Oct – Review Steady-State TEP Analyses
 - Aug – Review Steady-State Sensitivity Model and Analysis, & SC
 - Sept to Oct – Stability Analysis Review
 - Nov – Provide 2016 TEP to Stakeholders for comment, To RC for Review
 - Nov to Dec – Review Final TEP
 - December 31 – TEP Approval
 - January – Provide Final Assessment Report with SH and RC comments
-
-

Thank You

Mary Melvin
mary.melvin@transervinternational.net
763.205.7086

ITO Stakeholders Meeting

2017 TEP Stakeholder Input Requested

Mary Melvin, Manager, Transmission Planning

November 2015

- TO has requested data (was due October 31, 2015)
- TO is reviewing data and building models
- ITO is also reviewing data and will review models when provided by TO
- Stakeholder input on development of the 2017 TEP is requested and must be provided by December 21, 2015
 - Send to
 - **support@transervinternational.net**

2017 TEP Request for Stakeholder Input

- Attachment K, Section 5 – Comparability

Stakeholders may propose transmission, generation and demand resources or other alternative solutions to needs identified during the transmission planning process, and proponents of all alternative solutions will be given equal opportunity to participate. Any entity proposing resources must complete a data sheet which will be posted on OASIS that will identify direct control load and interruptible demand. Advanced technologies and demand-side resources will be treated comparably, where appropriate in the transmission planning process, to transmission and generation solutions. Transmission plans developed under this Attachment K will be technology neutral, balancing costs, benefits and risks associated with the use of demand-side resources, transmission, generation or other alternative solutions to meet the needs of transmission customers and the Transmission Owner.

Questions

Thank You

Mary Melvin
mary.melvin@transervinternational.net
763.205.7086

ITO Stakeholders Meeting

Proposed GIC Values Approval Status

Mary Melvin, Manager, Transmission Planning

November, 2015

Proposed GIC Values Approval Status

- Proposed GIC Values are posted on OASIS
 - TO performed a Stability Analysis with generation at the posted GIC values
 - ITO is reviewing this analysis
 - Some projects have been identified
 - Implementation of GIC values may depend on in-service dates of projects to mitigate impacts
 - Posting of the ITO conclusions is expected by Dec 1
-
-

Questions

Thank You

Mary Melvin
mary.melvin@transervinternational.net
763.205.7086
