



Eastern Interconnection Planning Collaborative

Overview of EIPC Phase 2: Status and Tasks

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**Joint IPTF/ESPWG Meeting
April 23, 2012
Albany, NY**

Phase 1 and Phase 2 Project Tasks

Phase 1 – Complete

Task 1 – Initiate Project

- Establish SSC
- Establish Study teams/processes

Task 2 – Integrate Regional Plans

- Aggregate Modeling
- Interregional Plans
- Expansion Options

Task 3 – Production Cost Analysis

- Eliminated

Task 4 – Macroeconomic Scenario Definition

- Stakeholder Consensus
- 8 Futures and 72 Sensitivities

Task 5 – Macroeconomic Analysis

- Informs policy/stakeholders
- Includes high level transmission costing

Task 6a – Expansion Scenario Concurrence

- SSC selects 3 scenarios from the 80 performed in Task 5

Task 6b – Report on Phase 1

Phase 2

Task 7 – Interregional Transmission Options Development

- Build-out on 3 selected scenarios
- 230 kV and up

TOTF

Task 8 – Reliability Review

- Consistent with NERC reliability criteria

TOTF

Task 9 – Production Cost Analysis

Task 10 – Generation and Transmission Costing

- High level cost estimates for both generation and transmission

Task 11 – Review of Results with Stakeholders

Task 12 – Final Report

Phase 1 SSC Alternative Futures



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Phase 1 Report: Formation of Stakeholder Process, Regional Plan Integration and Macroeconomic Analysis

DOE Award Project
DE-OE0000343

December, 2011

S3

S2

S1

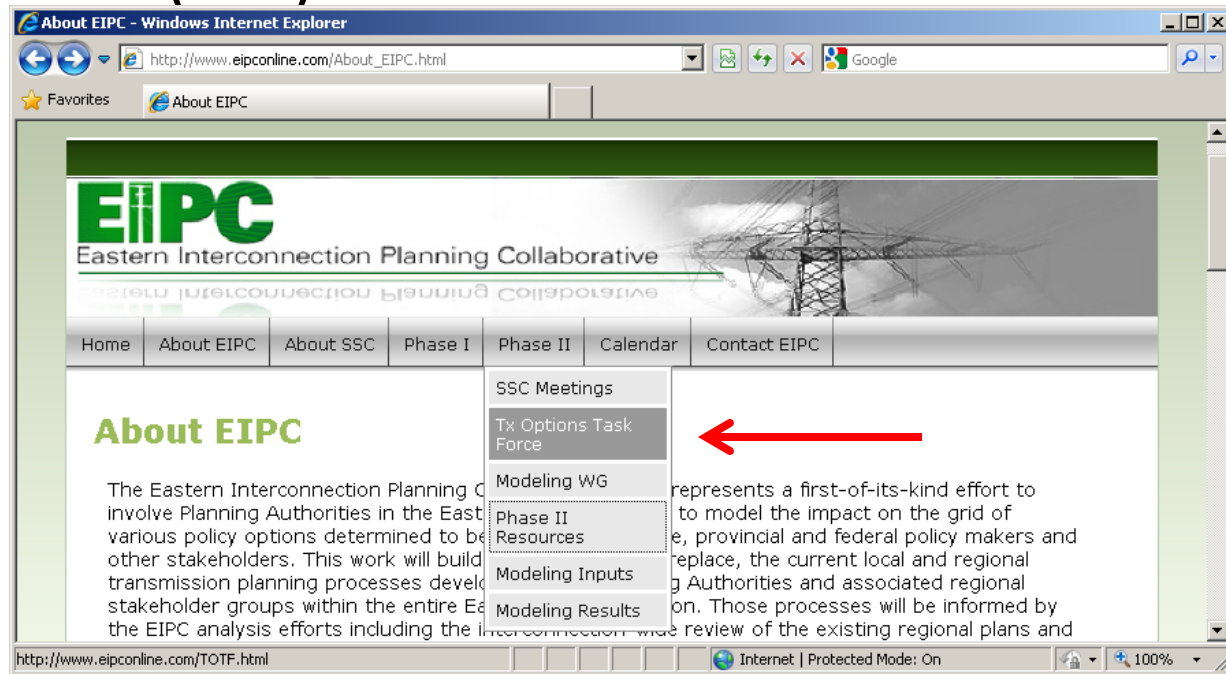
Future Descriptions	
Future 1: Business as Usual	Continuation of existing conditions including load growth, existing Renewable Portfolio Standards (RPSs), and currently proposed environmental regulations.
Future 2: National Carbon Constraint – National Implementation	Reduce economy-wide carbon emissions by 42% from 2005 levels in 2030 and 80% in 2050; achieved by utilizing a nation-wide/eastern interconnection-wide implementation strategy.
Future 3: National Carbon Constraint – Regional Implementation	Reduce economy-wide carbon emissions by 42% from 2005 levels in 2030 and 80% in 2050; achieved by utilizing a regional implementation strategy.
Future 4: Aggressive Energy Efficiency/Demand Response/Distributed Generation/Smart Grid	Aggressive implementation of energy efficiency (EE), demand response (DR), distributed generation (DG) and smart grid technology resulting in decline in load from today's levels.
Future 5: National Renewable Portfolio Standard – National Implementation	Meet 30% of the nation's electricity requirements from renewable resources by 2030; achieved by utilizing a nation-wide/eastern interconnection-wide implementation strategy.
Future 6: National Renewable Portfolio Standard – Regional Implementation	Meet 30% of the nation's electricity requirements from renewable resources by 2030; achieved by utilizing a regional implementation strategy.
Future 7: Nuclear Resurgence	Significant nuclear facilities developed in Eastern Interconnection.
Future 8: Combined Federal Climate and Energy Policy	Reduce economy-wide carbon emissions by 50% from 2005 levels in 2030 and 80% in 2050 combined with meeting 30% of the nation's electricity requirements from renewable resources by 2030 and significant deployment of energy efficiency measures, demand response, distributed generation, smart grid and other low-carbon technologies; achieved by utilizing a nation-wide/eastern interconnection-wide implementation strategy.



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Phase 2 Resources on EIPC Website

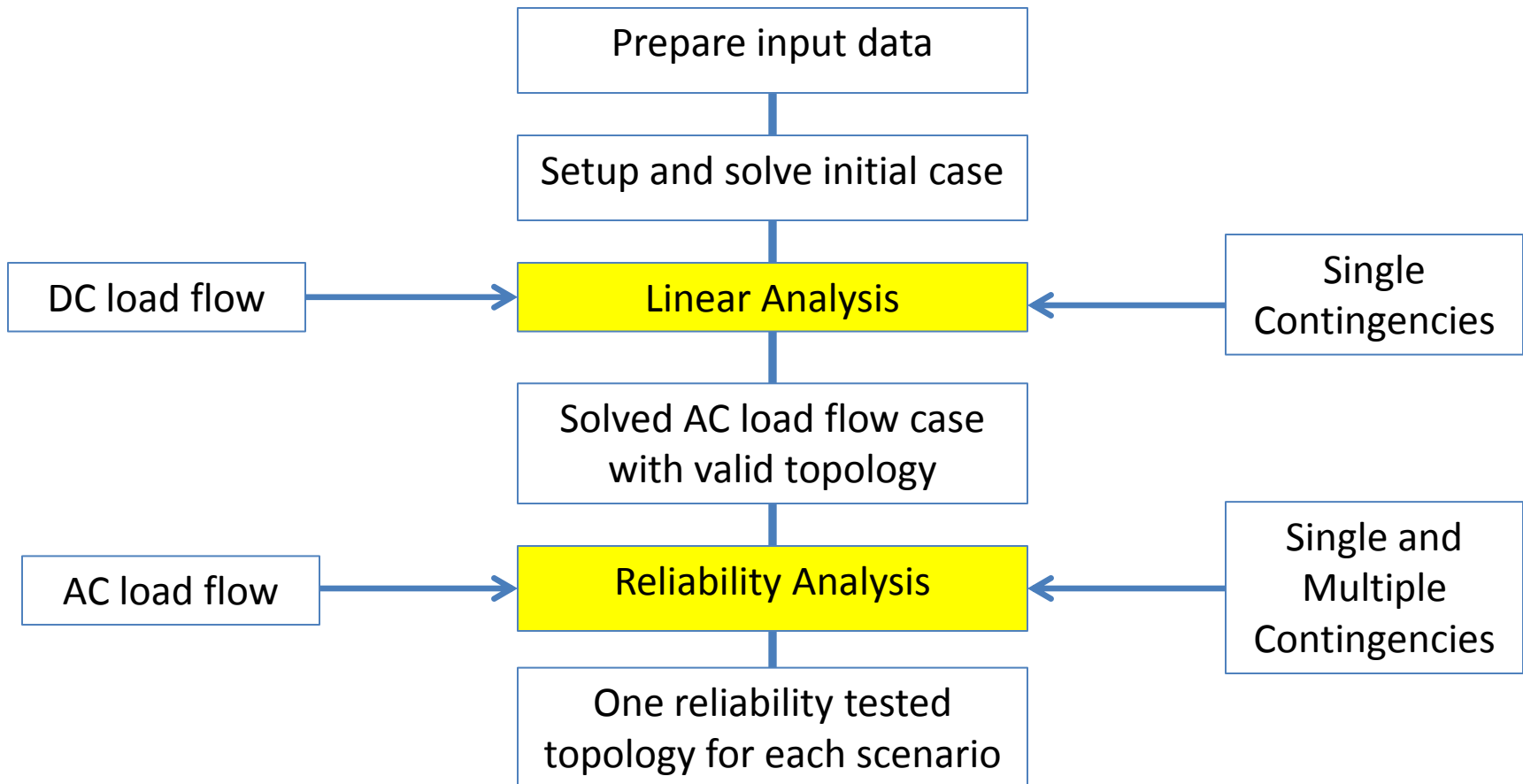
- www.eipconline.com
 - Phase II (Tab)



Transmission Options Task Force (TOTF)

- **Canadian Provincial Representative**
 - Rob Sinclair, Ontario Power Authority
- **End Users**
 - Erin Hogan, NYSEDA
 - Fred Plett, MA Office of Atty General
- **Generation Owners & Developers**
 - Michael Goggin, AWEA
- **NGOs**
 - Ed Pfeiffer, Quanta Technology
 - Matt Schuerger, Energy Systems Consulting Services
- **Other Suppliers**
 - Robert Stein, HQUS Energy Services
- **States**
 - Diane Barney, NY State Dept. of Public Service
 - Hisham Choueiki, PUC of Ohio
 - Stuart Hansen, MN Public Utilities Commission
 - John Stovall, Oak Ridge National Laboratory
 - Craig Taborsky, MD Public Service Commission
 - Michael Wegner, Kansas Corporation Commission
- **TDU-Public Power**
 - Dustin Betz, Nebraska Public Power District
 - Anie Philip, Long Island Power Authority
- **Transmission Owners & Developers**
 - Randell Johnson, Northeast Utilities
 - Evan Wilcox, AEP
- **PI Members**
 - Co-coordinators David Till, TVA and Dan Fredrickson, MAPPCOR
 - Jeremy Bennett, Southern Co.
 - John Buechler, NYISO
 - Samrat Datta, Entergy
 - Stan Doe, ISO-NE
 - David Duebner, MISO
 - Chuck Liebold, PJM
 - Kerry Marinan, ATC
 - Flora Flygt, ATC
 - Pranaya Neupane, JEA
 - Joe Payne, Entergy
 - Akarsh Sheilendranath, ISO-NE
 - Zach Smith, NYISO

Transmission Build-Out Process



3 Build-outs but 5 Cases

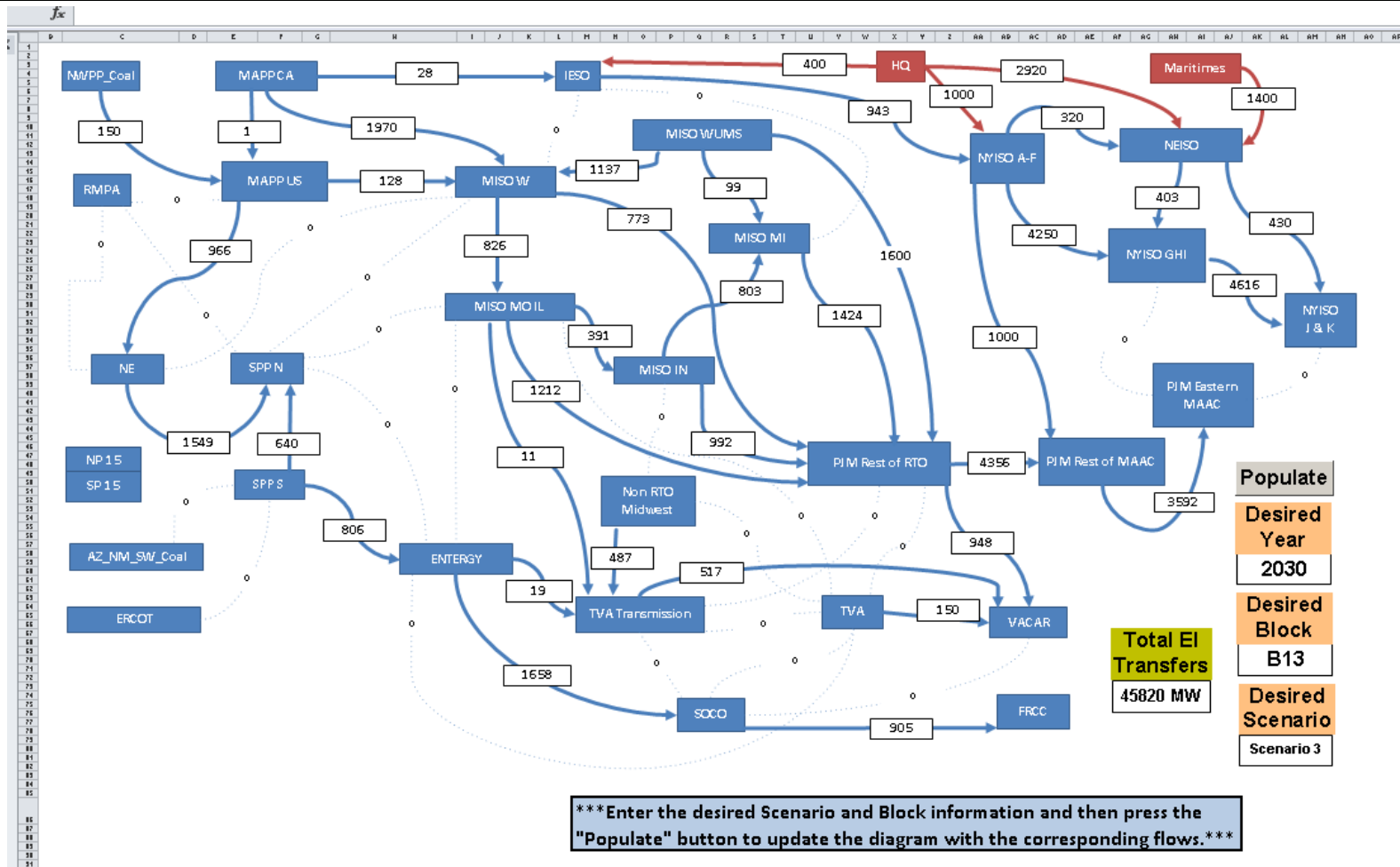
Load Flow Cases being Built

- Scenario 1, Block 1
- Scenario 1, Block 13
- Scenario 2, Block 1
- Scenario 2, Block 13
- Scenario 3, Block 1

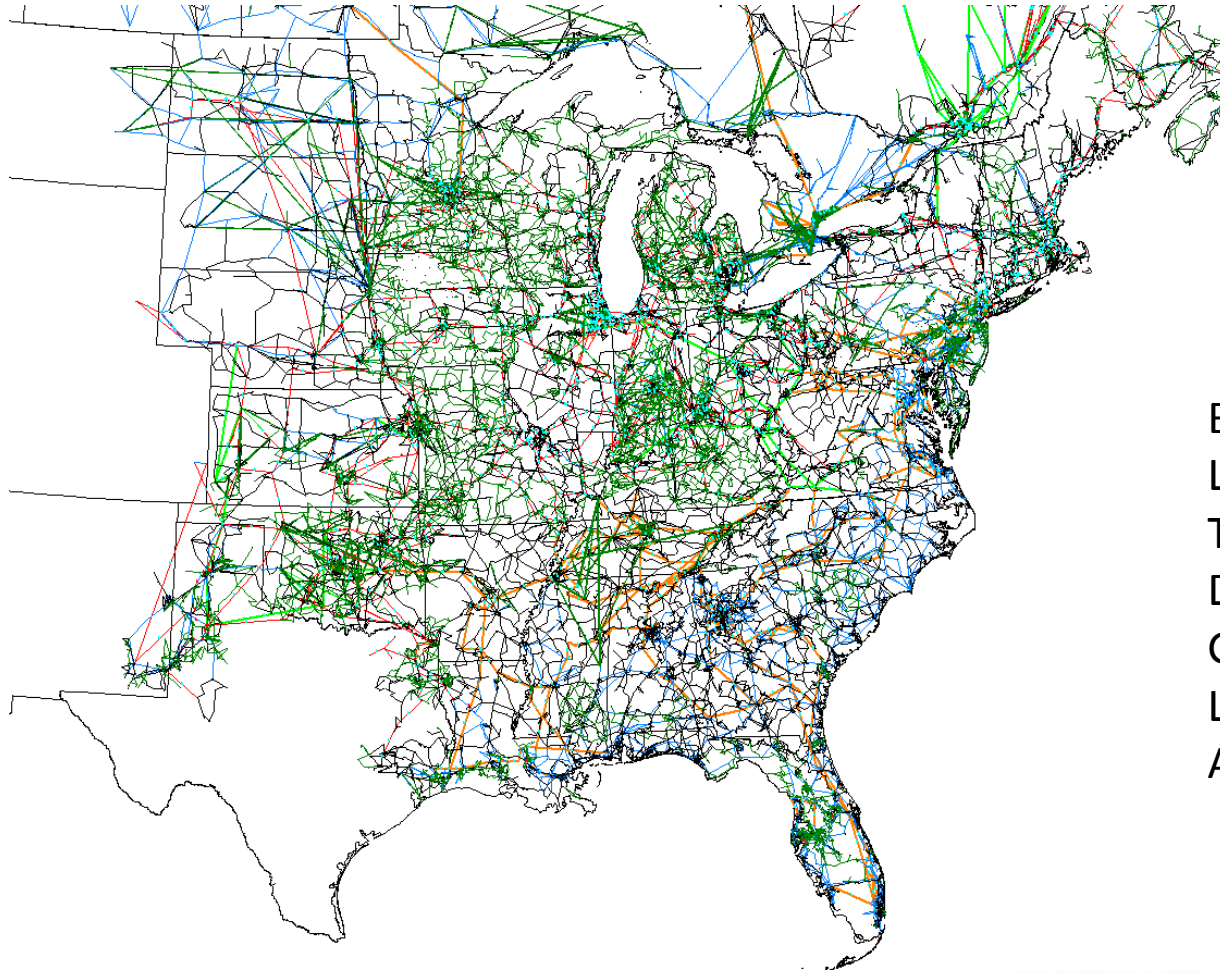
Cases versus Topologies

- Block 1 is the peak
- Block 13 is less-than-peak and may stress the system more than peak
- Final option chosen will satisfy reliability tests in both Block 1 and Block 13 load levels
- One unique topology for each scenario

NEEM Transfer Level Map for Scenarios

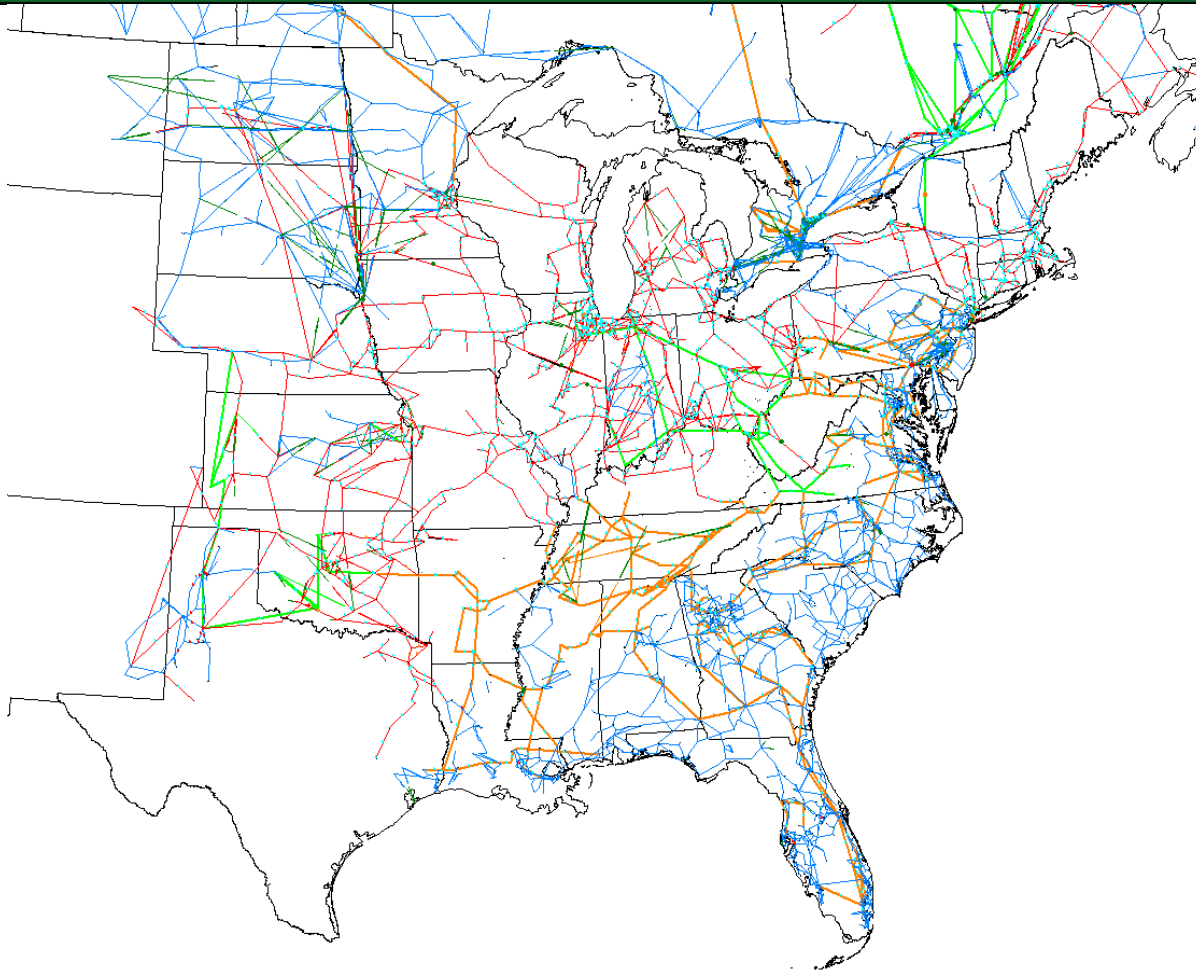


Load Flow Model - All lines

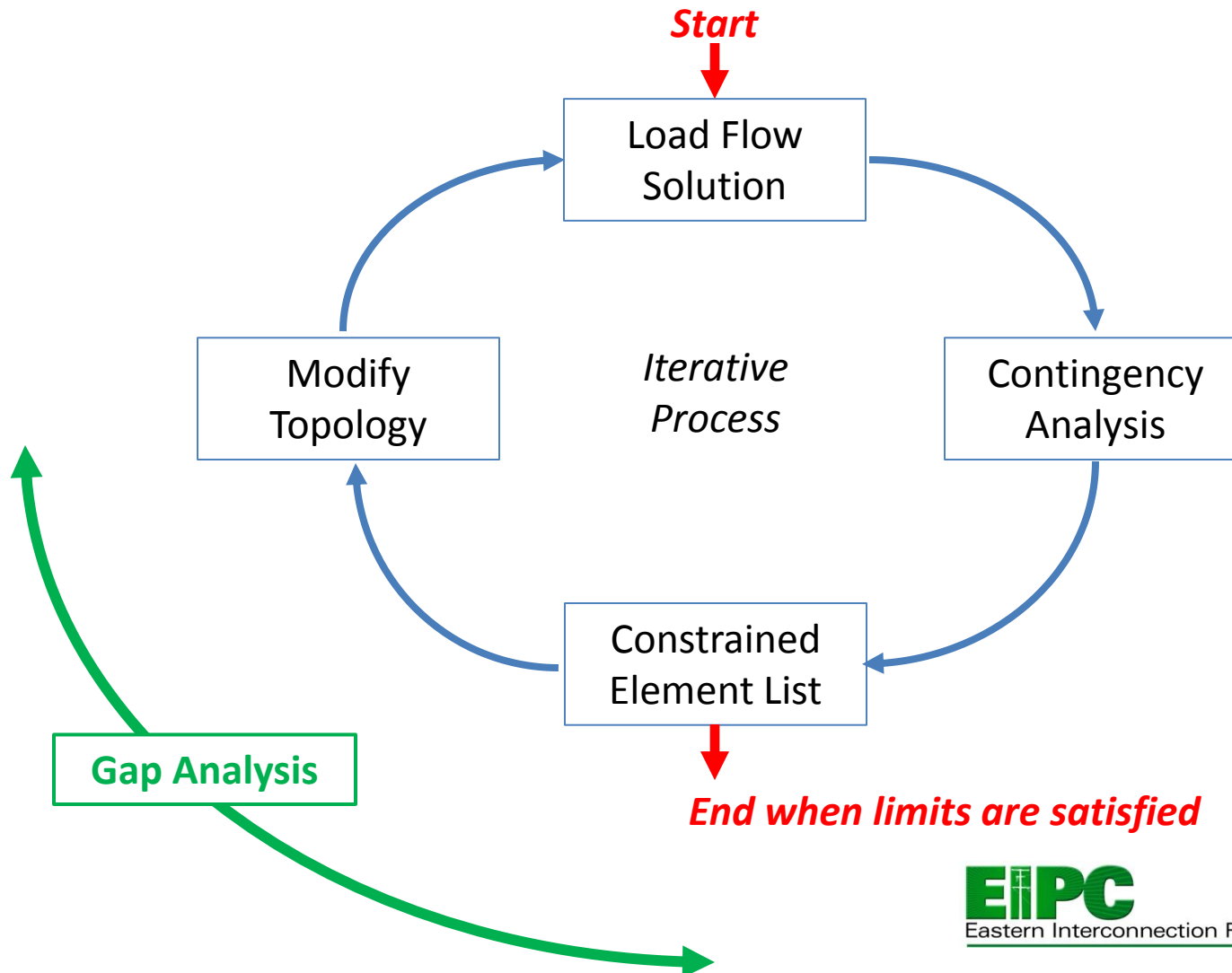


Buses – 70,006
Lines – 63,432
Transformers – 26,049
DC Lines – 41
Generators – 10,305
Loads – 38,675
Areas – 128

Load Flow Model - 230-kV and above

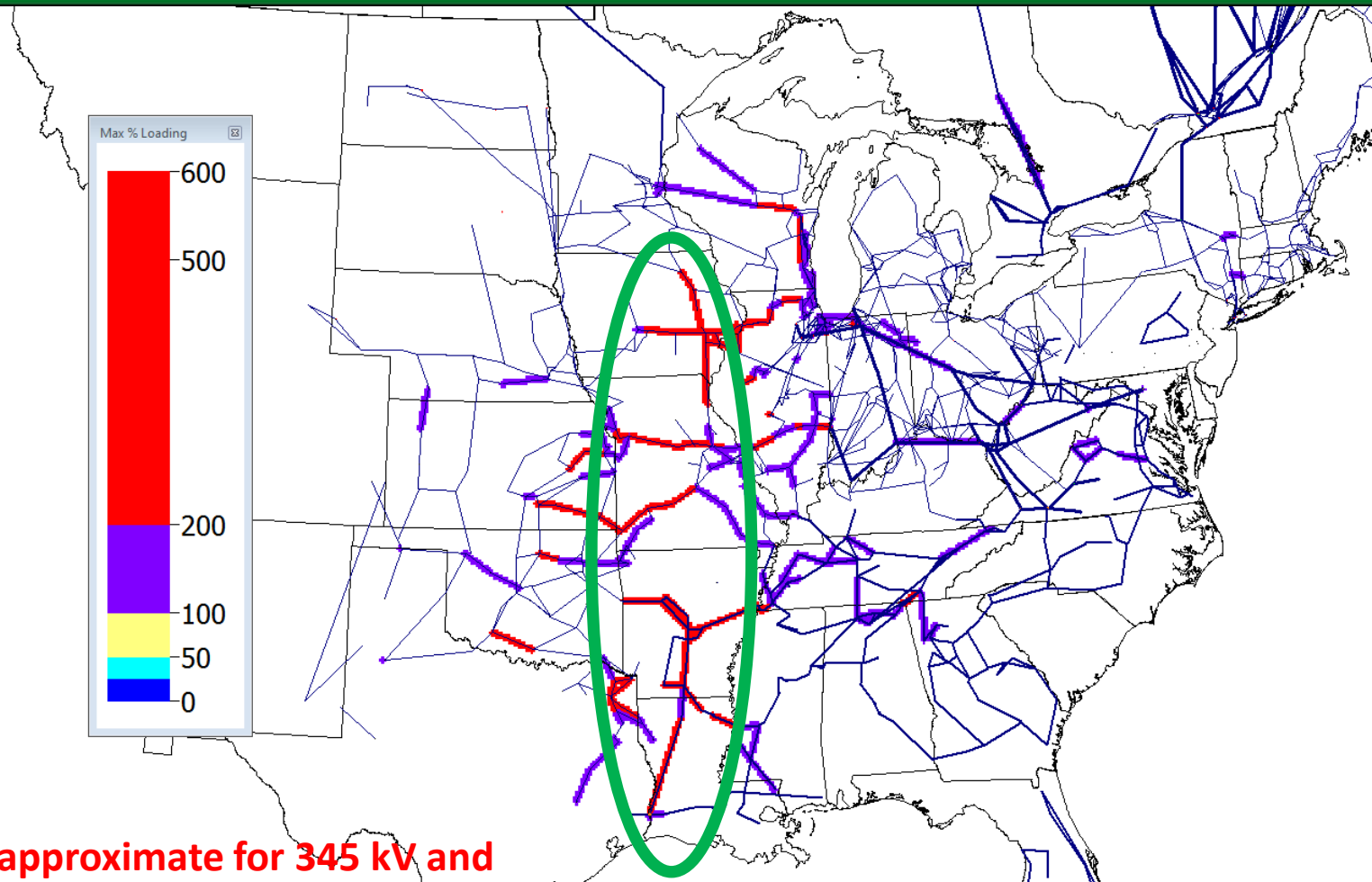


Analysis Process



Initial Constrained Elements

Preliminary Results



Map is approximate for 345 kV and above. 254 of the 302 elements are shown.

S1B1Pass1 – Limiting Constraints Identified

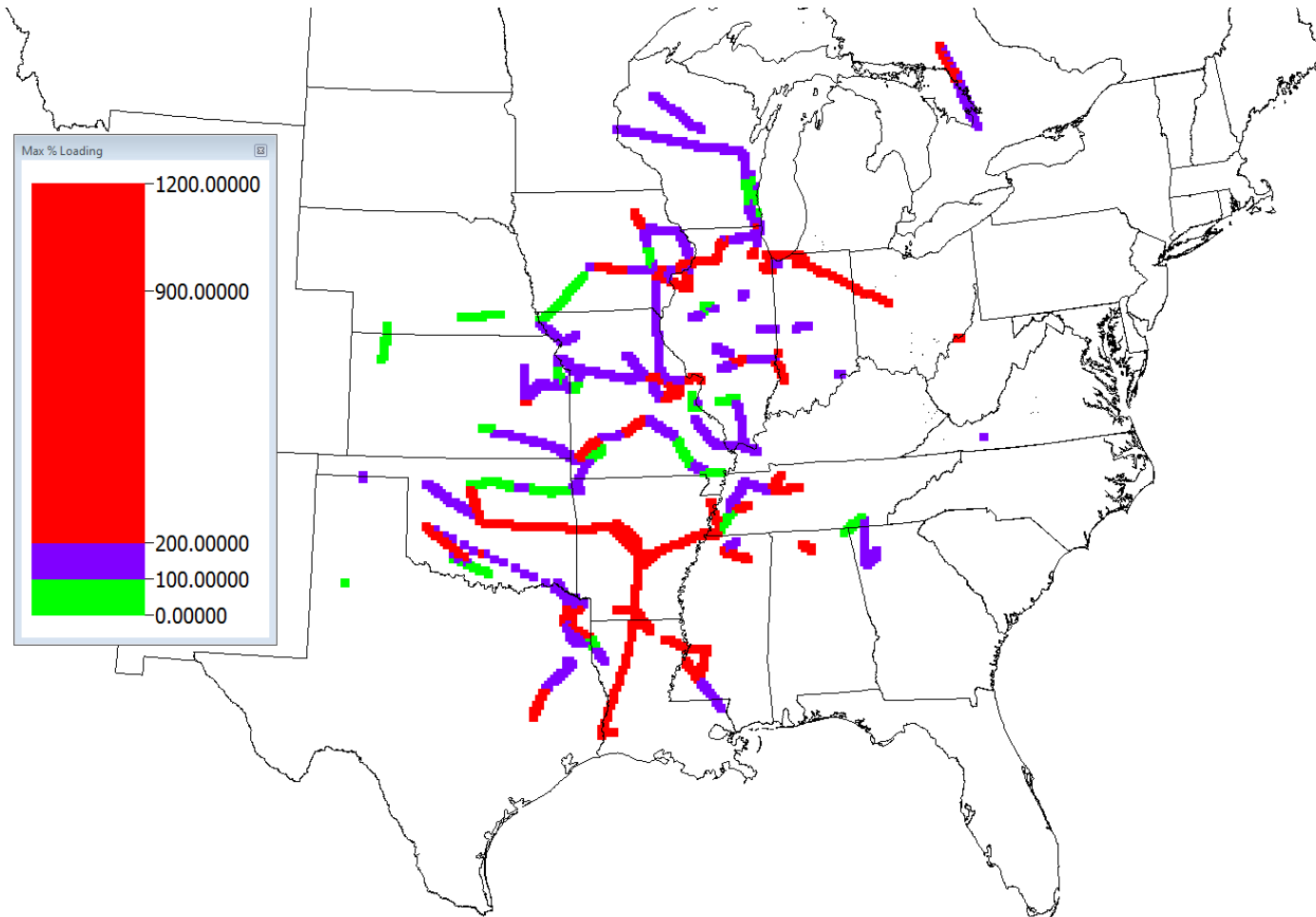
Preliminary Results: Example

	A	B	C	F			G		
1	Projected Constraints								
2	Loading (%)	Estimated Loading (MVA)	Rate B (MVA)	Limiting Constraint			Contingency		
3	ENTERGY								
4	156.7	2318.3	1479.0	300039 7FAIRPT	345 541199 ST JOE 3	345 1	C:300039 7FAIRPT	345 640139 COOPER 3	345 1
5	155.3	1865.3	1201.0	300040 7FLETCH	345 300047 7SALEM	345 1	C:338140 8HOLBT	500 338145 8ISES	500 1
6	120.4	2084.9	1732.0	300040 7FLETCH	345 300047 7SALEM	345 1	Base Case		
7	79.8	1382.0	1732.0	300040 7FLETCH	345 300054 7GOBKNOB	345 1	C:344974 7LUTESVIL	345 345773 7ST FRANC	345 1
8	150.6	2608.2	1732.0	300041 7FRANKS	345 300042 7HUBEN	345 1	C:345088 7MCCREDIE	345 345230 7MONTGMRY	345 1
9	229.3	2279.1	994.0	300041 7FRANKS	345 300042 7HUBEN	345 1	Base Case		
10	129.6	3367.8	2598.1	300041 7FRANKS	345 300047 7SALEM	345 1	C:338140 8HOLBT	500 338145 8ISES	500 1
11	125.9	3270.7	2598.0	300041 7FRANKS	345 300047 7SALEM	345 1	Base Case		
12	129.3	2799.4	2165.0	300042 7HUBEN	345 300045 7MORGAN	345 1	C:300045 7MORGAN	345 549984 BROOKLINE 7	345 1
13	134.6	2331.7	1732.0	300042 7HUBEN	345 300045 7MORGAN	345 1	Base Case		
14	140.3	2429.4	1732.0	300044 7MCCRED	345 300049 7THOMHL	345 1	C:344002 7WADAIRTP	345 345436 7PALMYRA	345 N1
15	118.0	1745.5	1479.0	300044 7MCCRED	345 300049 7THOMHL	345 1	Base Case		
16	145.9	4039.4	2768.0	300044 7MCCRED	345 345088 7MCCREDIE	345 1	C:344002 7WADAIRTP	345 345436 7PALMYRA	345 N1
17	195.6	1869.5	956.0	300044 7MCCRED	345 345088 7MCCREDIE	345 1	Base Case		
18	154.1	2668.6	1732.0	300045 7MORGAN	345 300739 7BLACKBERRY	345 1	C:300740 7SPORTSMAN	345 512650 GRDA1 7	345 1
19	217.3	2077.4	956.0	300045 7MORGAN	345 300739 7BLACKBERRY	345 1	Base Case		
20	90.4	1381.1	1528.0	300046 7NEWMAD	345 300051 7STFRANCISTP	345 1	C:344974 7LUTESVIL	345 345773 7ST FRANC	345 1
21	144.2	2203.3	1528.0	300049 7THOMHL	345 344002 7WADAIRTP	345 N1	C:344002 7WADAIRTP	345 345436 7PALMYRA	345 N1
22	102.0	1325.3	1299.0	300051 7STFRANCISTP	345 300054 7GOBKNOB	345 1	C:344974 7LUTESVIL	345 345773 7ST FRANC	345 1
23	91.2	1185.3	1299.0	300051 7STFRANCISTP	345 300054 7GOBKNOB	345 1	Base Case		

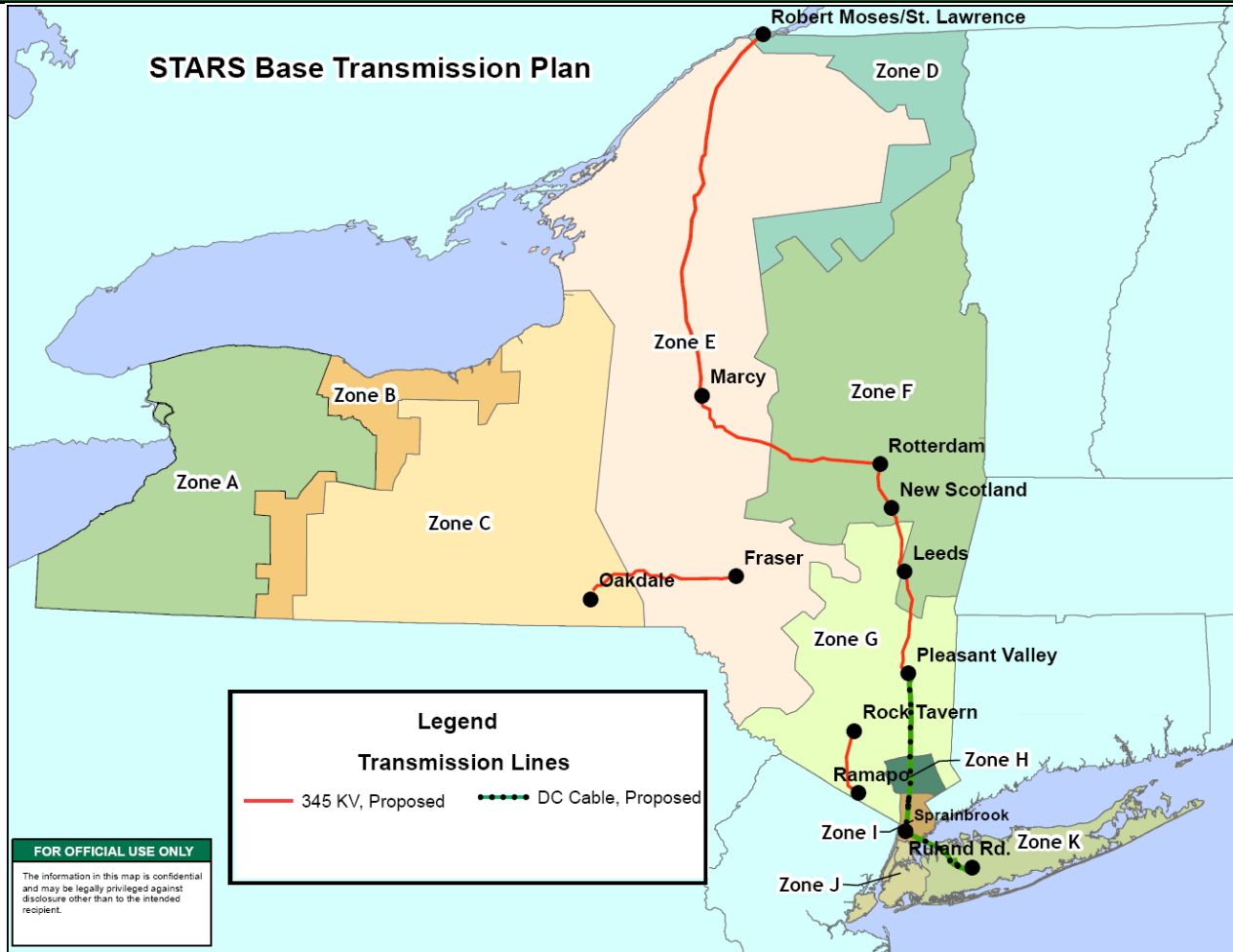
Snapshot of limiting constraint list. Note, a line or transformer can appear more than once as it is overloaded for more than on contingency.

S1B1Pass1 – Constrained Elements

Preliminary Results



STARS Base Transmission Plan



Steps 10, 11, and 13

10. PAs set-up initial load flow for each Scenario (Initial Case Development)

Scenario 1, Block 1 and Block 13 and Scenario 3, Block 1 cases complete, Scenario 2 is in development

11. PAs perform gap analysis, develop initial concepts for transmission additions, and possibly solve load flow for each Scenario

Scenario 1 and 3 underway, Scenario 2 to follow

13. Identify New Transmission for each Scenario

Scenario 1 underway, others to follow

Steps 9 through 11, 13

	S1B1	S1B13	S2B1	S2B13	S3B1	Description
Step 9	Complete	Complete	Complete	Complete	Complete	Data Sets
Step 10	Complete	Complete	In-Progress	In-Progress	Complete	Initial Load Flow Case
Step 11	In-Progress	In-Progress	Not Started	Not Started	In-Progress	Gap Analysis
Step 13	In- Progress		Not Started		Not Started	Identify New Tx

Phase 2 Schedule

Step	Activity	Current Schedule	Comment
10 and 11	Load Flows, Gaps	Through 4/13/12	Revised deadline
12	TOTF Meeting	2/22-23/12	Done
13	Initial New Transmission	2/27/12 to 4/13/12	In process
14	TOTF Meeting	3/28-29/12	Done
15	SSC Meeting	4/18-19/12	Omaha, NB
16	Incorporate Feedback	4/23/12 to 5/11/12	
17	TOTF Meeting	5/15-16/12	Memphis, Confirmed
18	Final Transfers, Mods	5/21/12 to 6/1/12	
19	Additional Feedback	6/4/12 to 6/8/12	
20 to 26	Final Mods, Final Rx Testing, Final Cases	6/11/12 to 8/10/12	

Questions

