



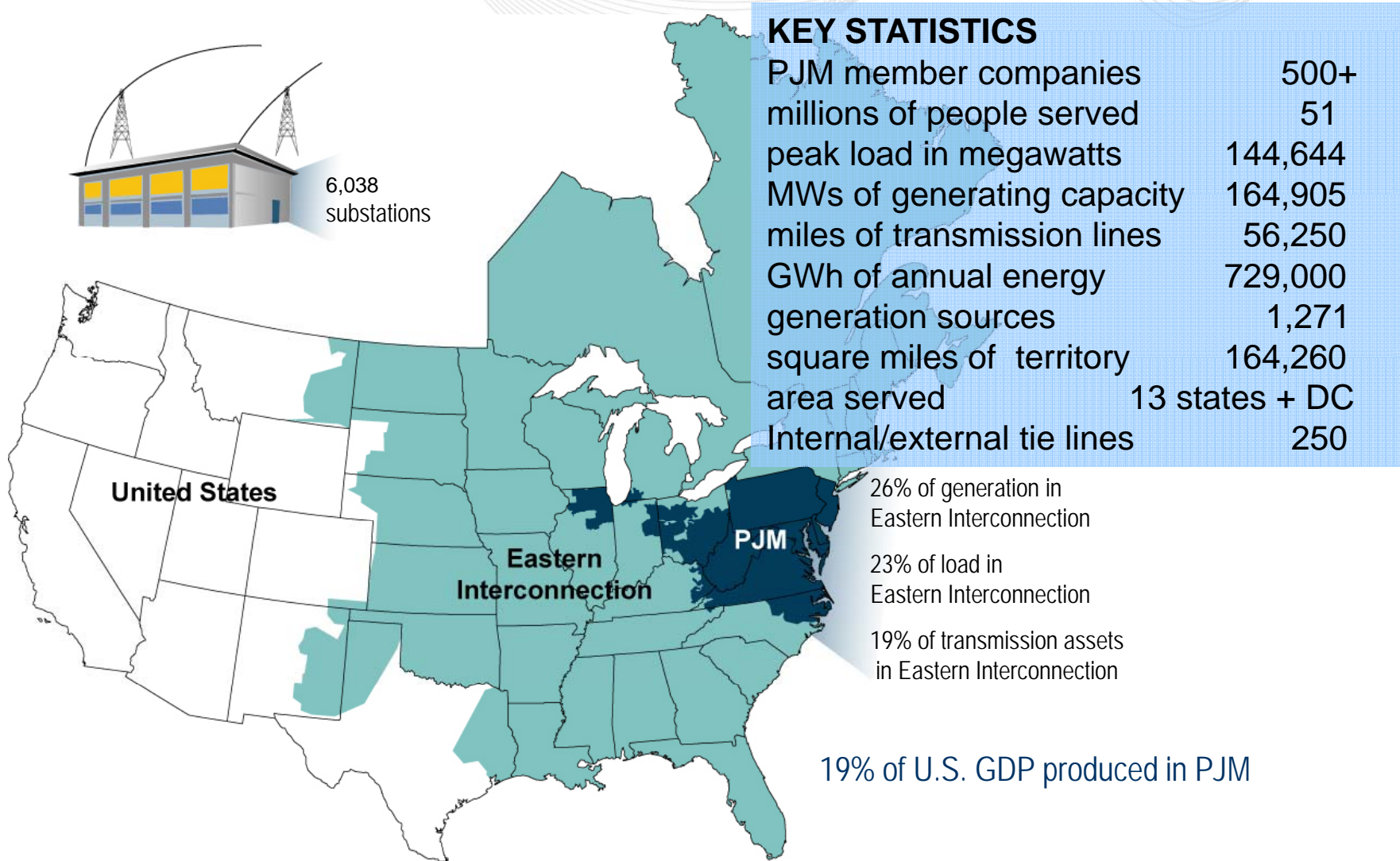
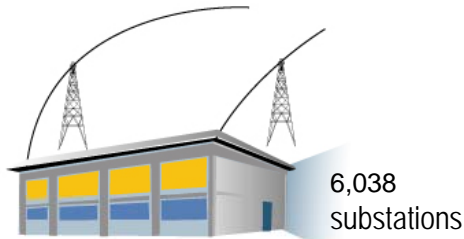
PJM

Regional Transmission Planning Process

Steven R. Herling
Vice President, Planning
PJM Interconnection
February 26, 2009



PJM as Part of the Eastern Interconnection



KEY STATISTICS

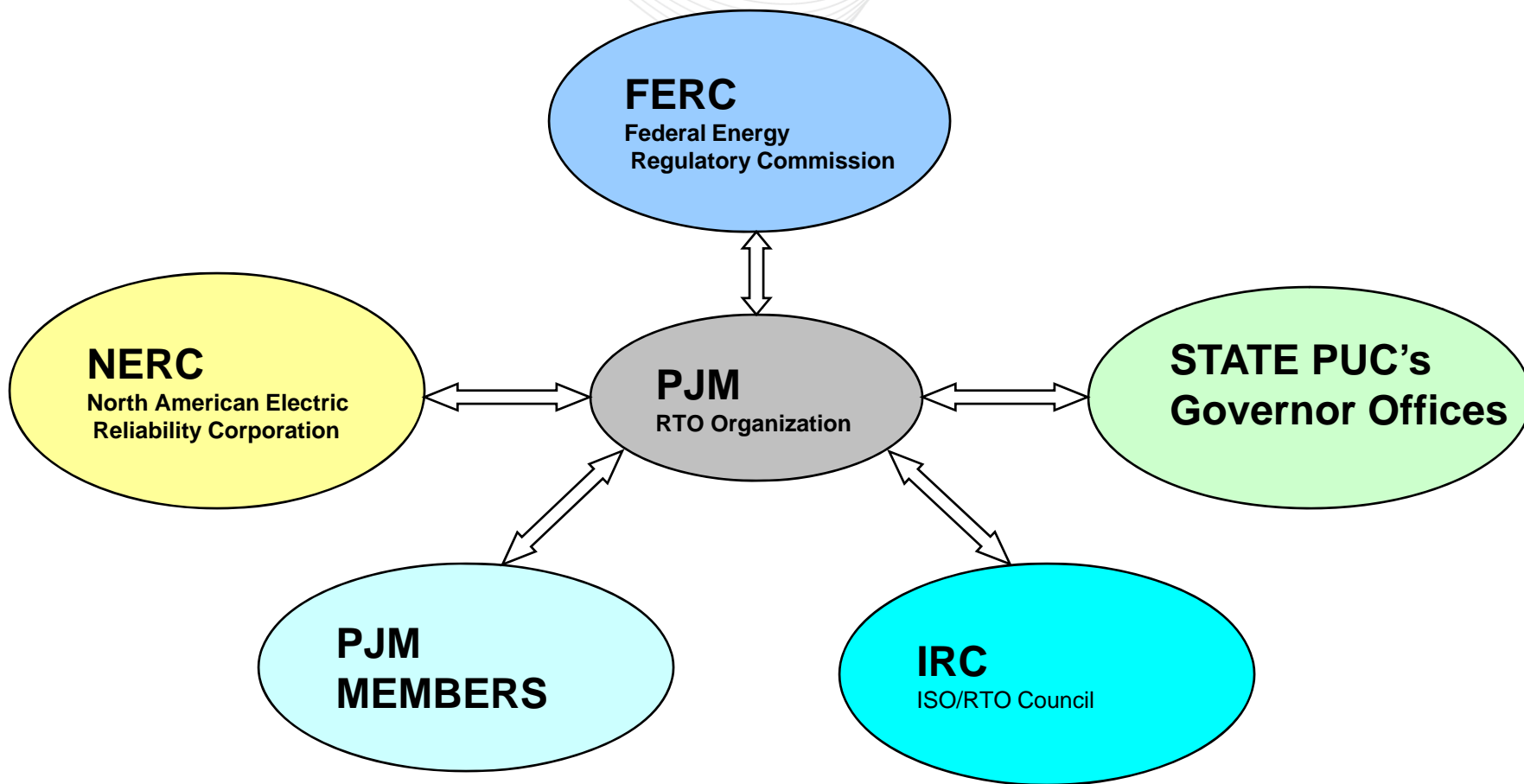
PJM member companies	500+
millions of people served	51
peak load in megawatts	144,644
MWs of generating capacity	164,905
miles of transmission lines	56,250
GWh of annual energy generation sources	729,000
square miles of territory area served	13 states + DC
Internal/external tie lines	250

26% of generation in Eastern Interconnection

23% of load in Eastern Interconnection

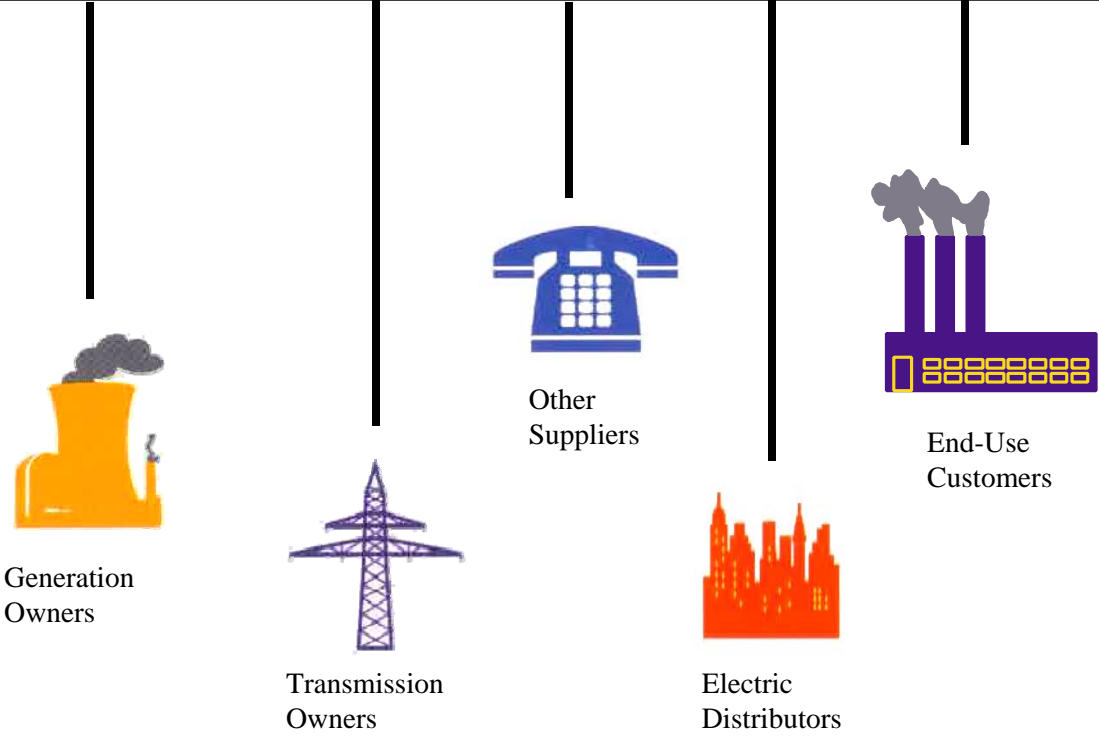
19% of transmission assets in Eastern Interconnection

19% of U.S. GDP produced in PJM



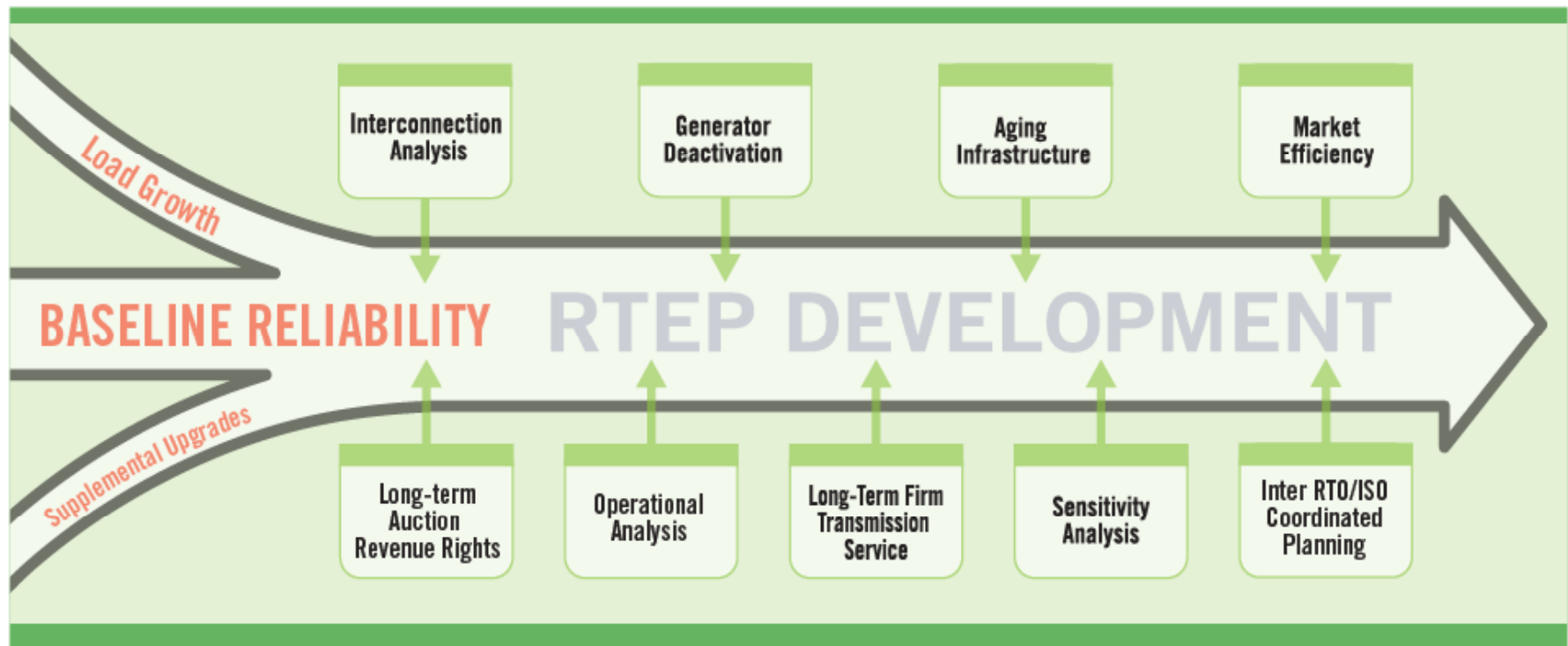
INDEPENDENT BOARD

Members Committee



- ❖ Planning Process Overview
- ❖ Compliance With Reliability Standards
 - North American Electric Reliability Council (NERC) Criteria – ERO
 - ReliabilityFirst Criteria (RFC), SERC – RROs
- ❖ Planning Assumptions
 - Load Forecasting
 - Generation Interconnections
- ❖ Load Deliverability Criteria
- ❖ Generator Deliverability Criteria

- ❖ Ongoing and cyclical
- ❖ Collaborative
- ❖ 15 year planning horizon
- ❖ NERC, RFC compliance
- ❖ Comprehensive and Holistic
- ❖ FERC-approved



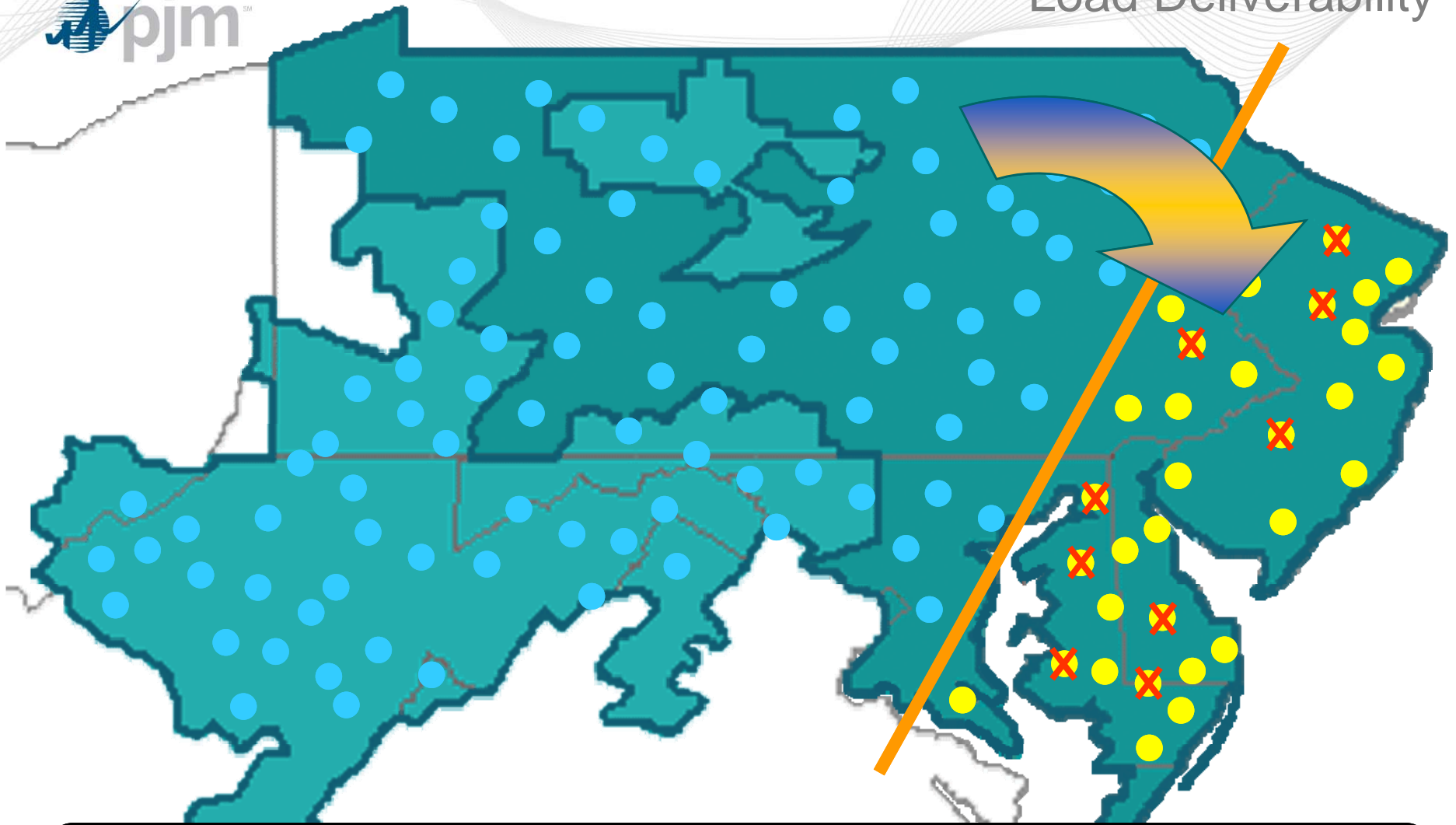
- **R1.** The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission system is planned such that the Network can be operated to supply projected customer demands and projected Firm Transmission Services, at all demand levels over the range of forecast system demands, under the contingency conditions as defined in Table I. To be valid, the Planning Authority and Transmission Planner assessments shall:
 - **R1.1.** Be made annually.
 - **R1.2.** Be conducted for near-term (years one through five) and longer-term (years six through ten) planning horizons.
 - **R1.3.** Be supported by a current or past study and/or system simulation testing that addresses each of the following categories, showing system performance following Table 1.
 - **R1.3.2.** Cover critical system conditions and study years as deemed appropriate by the responsible entity.

- **R2.** When System simulations indicate an inability of the systems to respond as prescribed in Reliability Standard TPL-002-0_R1, the Planning Authority and Transmission Planner shall each:
 - **R2.1.** Provide a written summary of its plans to achieve the required system performance as described above throughout the planning horizon:
 - **R2.1.1.** Including a schedule for implementation.
 - **R2.1.2.** Including a discussion of expected required in-service dates of facilities.

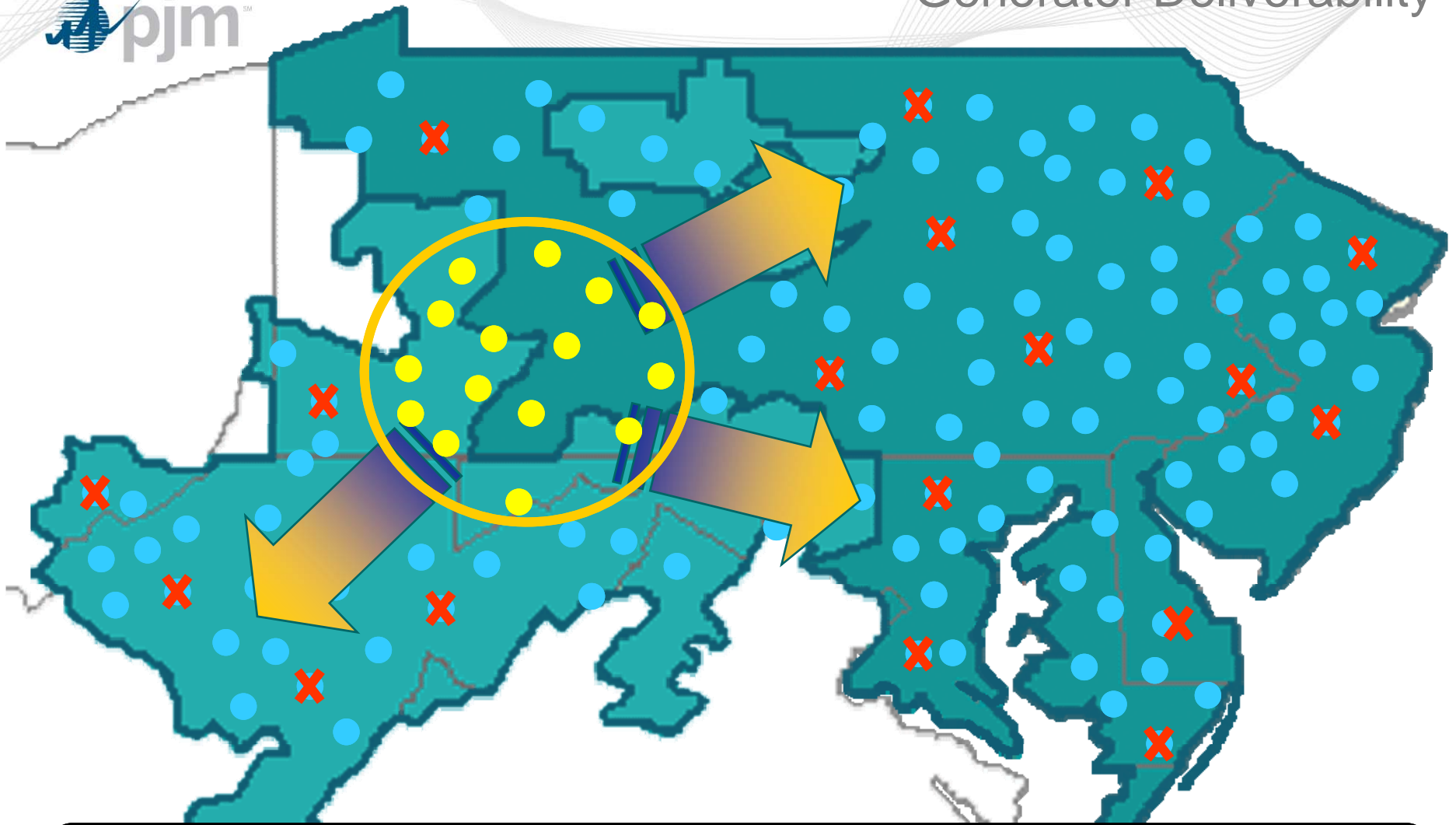
Standard	Category	Contingencies
TPL-001	A	All Facilities in Service
TPL-002	B	Fault with Normal Clearing – Loss of all Facilities Associated with a Single Contingency
TPL-003	C1	Bus Section Faults
	C2	Breaker Failure
	C3	Fault with Normal Clearing Followed by Re-Dispatch Followed by a Second Fault with Normal Clearing (n-1-1 Contingency)
	C5	Multiple Circuit Tower Line
TPL-004	D	Extreme Events

- ❖ 50/50 peak load forecast
 - Based on “normal” summer weather
 - 50% probability that forecast will be exceeded due to hotter than normal weather
 - Does not represent emergency conditions
 - Demand response is not activated
- ❖ 90/10 peak load forecast
 - Based on “extreme” summer weather
 - 10% probability that forecast will be exceeded due to hotter than normal weather
 - Represents emergency conditions
 - Demand response is activated
- ❖ Load deliverability models 90/10 load in area under test and 50/50 load elsewhere
- ❖ Generator deliverability and all other criteria tests model 50/50 load

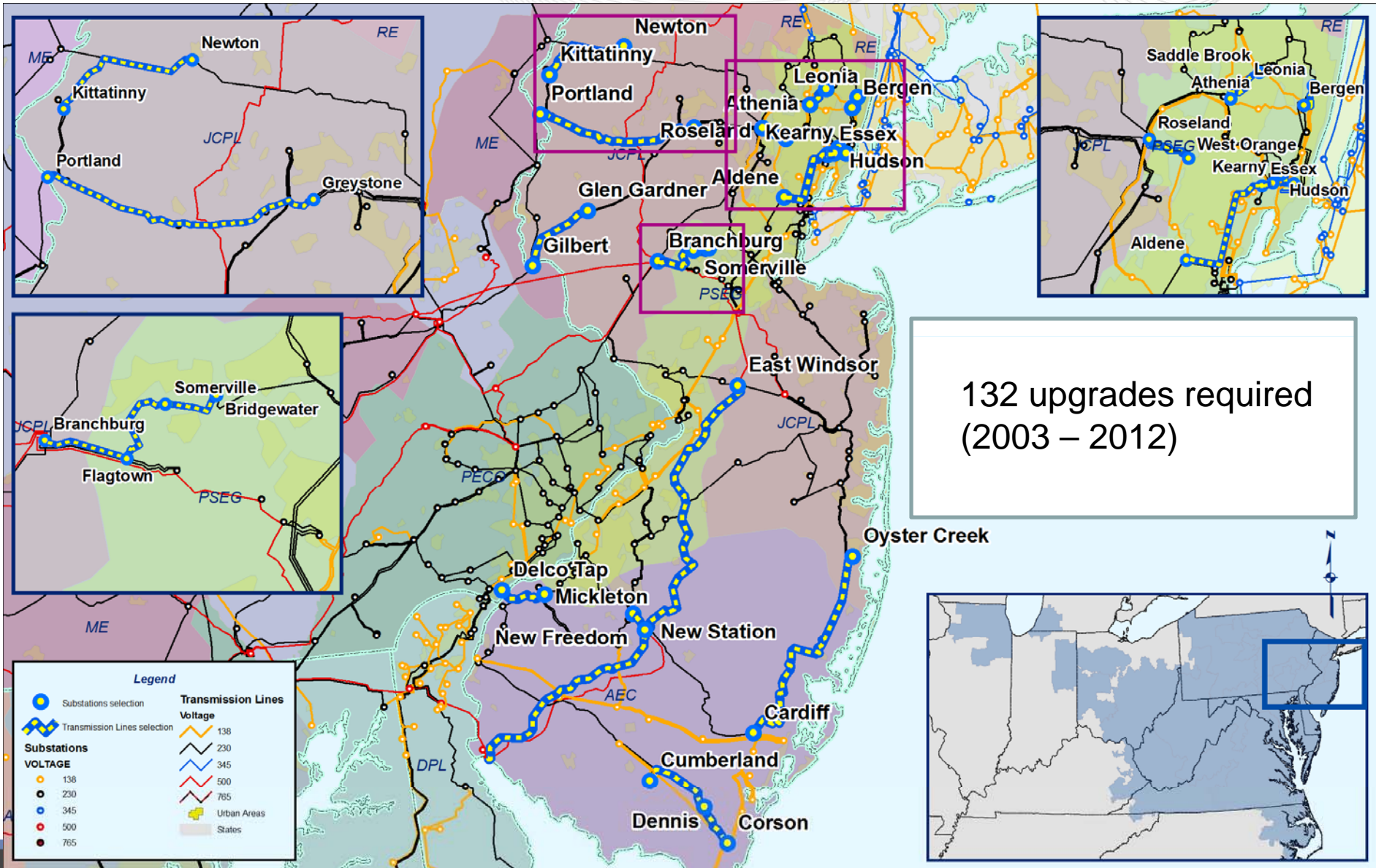
- ❖ **Generation Interconnection Process**
 - Study Process
 - Feasibility Study
 - System Impact Study
 - Facilities Study
 - Construction Service Agreement / Interconnection Service Agreement
- ❖ **Queue Volumes**
 - Withdrawal rates
- ❖ **All Interconnection Projects Included in RTEP Studies Upon Execution of Interconnection Service Agreement in Same Manner as In-service Projects**
- ❖ **Interconnection Projects Having Executed a Facilities Study Agreement are Included in RTEP Analyses to the Extent That Their Interconnection Rights Contribute to the Need For Transmission Upgrades**



Transmission system's capability to deliver energy from aggregate of all capacity resources to an electrical area experiencing a capacity deficiency.



Strength of the transmission system to ensure that the aggregate of generators in a given area can be reliably transferred to the rest of PJM.





2012 Retool – Susquehanna to Roseland Project

Overload Reduction For Single Contingencies

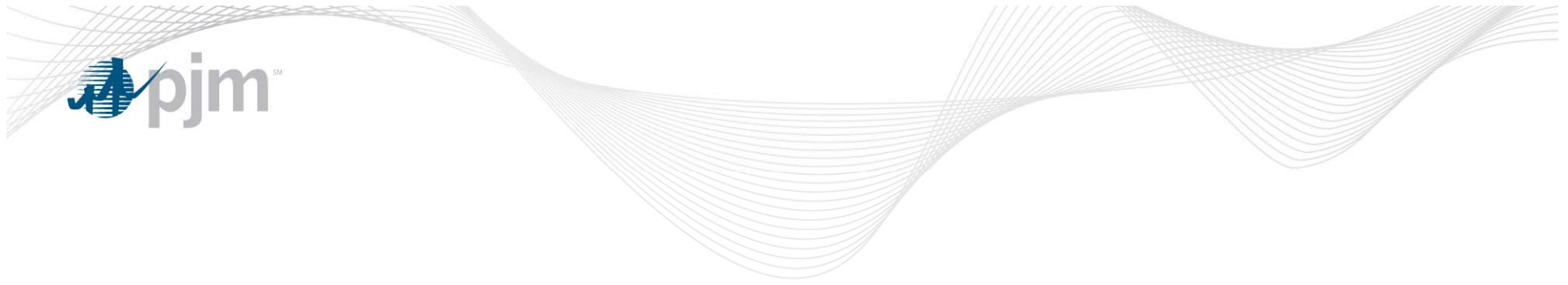
Overloaded Facility			Without Susq- Roseld	With Susq- Roseld
Fr Name	To Name	kV		
BRIDGWTR	MIDDLESEX	230	2021	>2022
BUSHKILL	KITATINY	230	2013	>2022
MTN CRK	MO PARK	230	2017	>2022
PORTLAND	KITATINY	230	2019	>2022
GILBERT	MO-TOWN	230	2021	>2022
LK ILIFF	MONTVILE	230	2019	>2022
E WINDSR	SMITHBRG	230	2017	2022
MTN CRK	PORTLAND	230	2014	>2022
PORTLAND	GRYSTN Q	230	2020	>2022
BRANCHBG	READ-GTN	230	2012	>2022
WHIPPANY	ROSELAND	230	2014	>2022
READ-GTN	ROSELAND	230	2012	>2022



2012 Retool – Susquehanna to Roseland Project

Overload Reduction For Single Contingencies

Overloaded Facility			Without Susq- Roseld	With Susq- Roseld
Fr Name	To Name	kV		
G GARDNR	CHESTER	230	2019	>2022
HOSENSAK	ELROY	230	2019	>2022
NEWTON	LK ILIFF	230	2018	>2022
RICHMOND	CAMDEN7	230	2015	2018
MONTVILE	ROSELAND	230	2014	>2022
KITATINY	POHATCNG	230	2016	>2022
COXSCRNR	LUMBRTN	230	2021	>2022
KITATINY	NEWTON	230	2017	>2022
WANEETA3	RICHMOND	230	2017	2019
GRYSTN Q	WHIPPANY	230	2012	>2022
W WHRTN	GRYSTN J	230	2016	>2022



Questions?