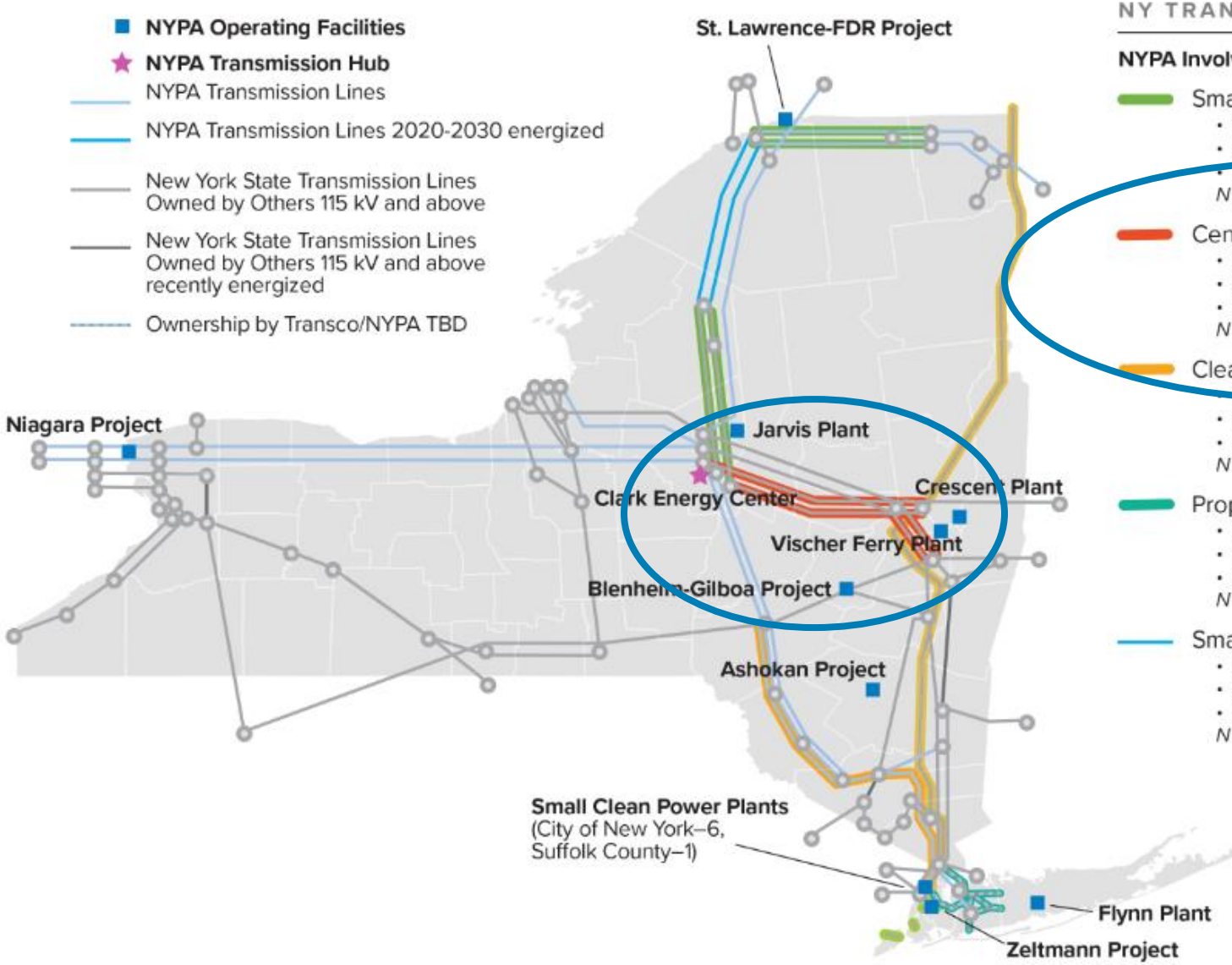
NEW YORK STATE | NY Power Authority

Proposed Modification to Exception #1 to ARR

Application of Reliability Rules (ARR)

September 30, 2024

Growing Transmission Capacity in New York State



NY TRANSMISSION PROJECTS

NYPA Involved Lines

Smart Path Connect
- 110 miles
- 230 / 345 kV
- In-service Q4 2025

NYPA, National Grid

Central East Energy Connect
- 93 miles
- 345 kV
- In-service Q4 2023

NYPA, LS Power Grid New York

Clean Path NY
- 190 miles
- +/- 345 kV HVDC
- In-service Q4 2027

NYPA, Invenergy and energyRe

Propel NY Energy
- Est. 90 miles of new line
- 138 / 345 kV
- In-service Q2 2030

NYPA, NY Transco

Smart Path
- 86 miles
- In-service Q2 2023
- 230kV (future 345kV capable)

NYPA

Non-NYPA Transmission

ConEd TRACE
- 15 miles
- In-service 2024
- 345/138 kV

Con Edison

Champlain Hudson Power Express
- 339 miles
- In-service Q4 2026
- +/- 345 kV HVDC

Transmission Developers Inc.

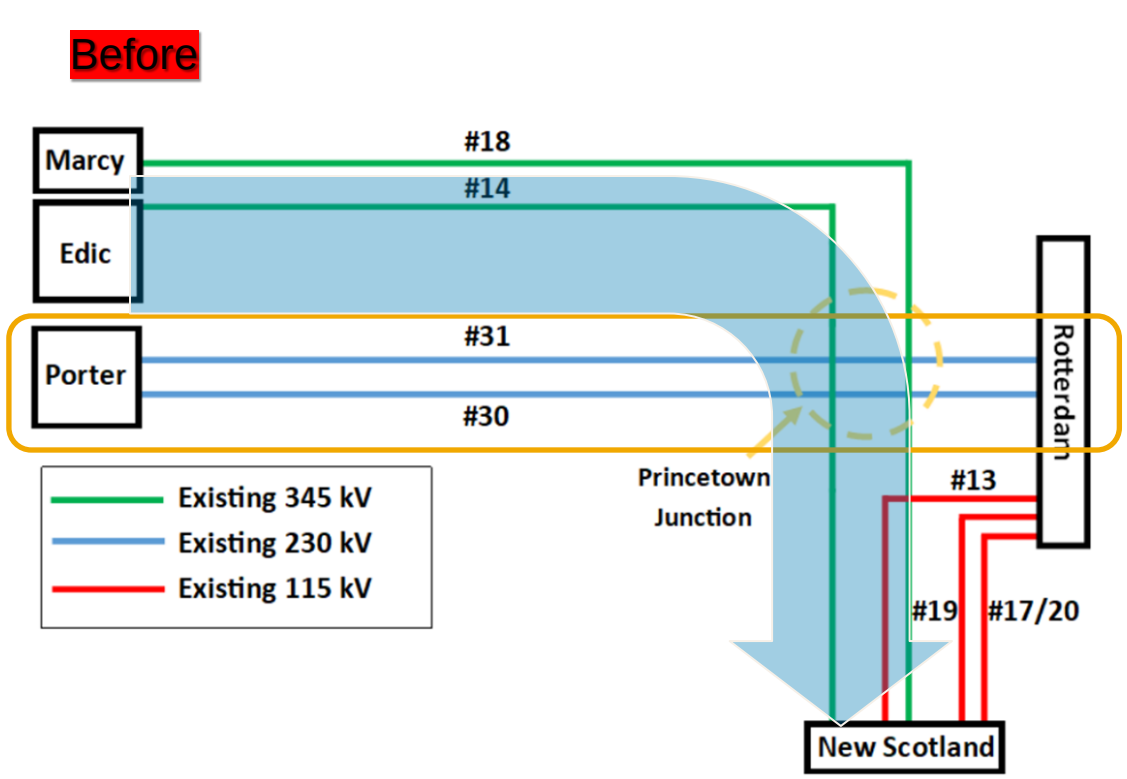
New York Energy Solution
- 54 miles
- In-service Q2 2023
- 345 kV

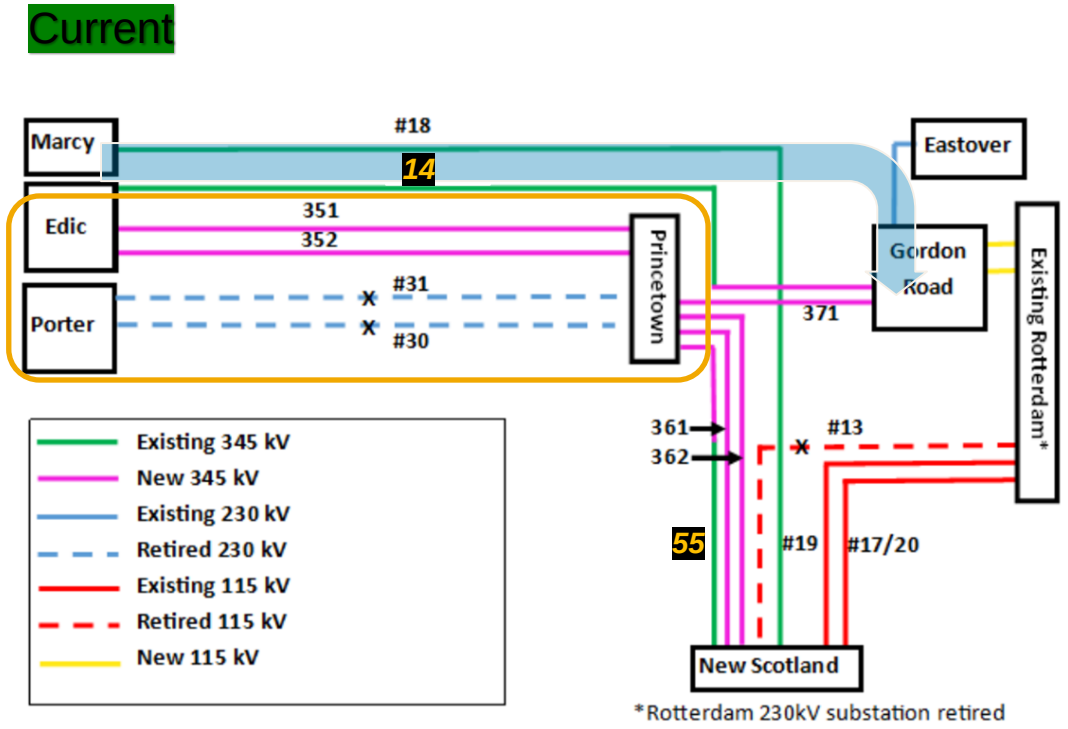
NY Transco

Rock Tavern to Sugarloaf
- 12 miles
- In-service Q2 2023
- 115 kV

NY Transco

With Central East Connect Project in-service





345 kV Edic to New Scotland*14* line was modified into Edic to Gordon Road *14* and Princetown to New Scotland 55 lines

ENS-14 line segmented into ***14*** and ***55*** lines.

230 kV Porter to New Scotland *31* and *32* lines into 345 kV *351* and *352* lines

The 230 kV **31** and **32** lines upgraded into the 345 kV ***351*** and ***352*** lines.

Exception #1 To Reliability Rules:
Post Contingency Flow on Marcy-New Scotland

The post-contingency flow on the ***Marcy-New Scotland 18*** line is allowed to exceed its LTE rating

- for the **loss of the *Edic-New Scotland 14*** line
  - by the amount of relief that can be obtained by tripping the Gilboa pumping load **as a single corrective action**.

Also, the post-contingency flow on the ***Edic-New Scotland 14*** line is allowed to exceed its LTE rating for **either** the

- **loss of the *Marcy-New Scotland 18*** line alone or the
- **double-circuit** loss of the ***Marcy-New Scotland 18*** and ***Adirondack-Porter 12*** lines,
  - by the amount of relief that can be obtained by tripping the Gilboa pumping load as a single corrective action.

Approved NYPP Operating Committee

January 27, 1988.

NYSRC Reliability Rule C.1

NYPA's Request

- **Modify the existing Exception #1 to ARR by modifying circuit names to the new line and,**
- **Incorporate the worst thermal contingency, the new 345 kV double circuit tower contingency.**

Exceptions to Exceed LTE Allowed For The Following Scenarios

Existing Exception

345 kV UNS-18

- Allowed to exceed LTE for the Loss of **ENS-14**

345 kV ENS-14

- Allowed to exceed LTE for the Loss of **UNS-18**.
- Or for the loss double-circuit loss of **UNS-18** and **Porter-12** lines

Proposed Exception

345 kV UNS-18

- Allowed to exceed LTE for the Loss of ***14***,
- Or for the loss double-circuit loss of ***351*** and ***352*** lines.

345 kV ***14***

- Allowed to exceed LTE for the Loss of **UNS-18**.
- Or for the loss double-circuit loss of **UNS-18** and **Porter-12** lines,
- Or for the loss double-circuit loss of ***351*** and ***352*** lines,

Is Exception #1 still effective with the new system topology?

NYPA analysis demonstrates dropping BG pumps is still effective at reducing post-contingency overloads on the modified ***14***, and UNS-18 lines

All Line In-Service Contingency Screening Results With BG Offline

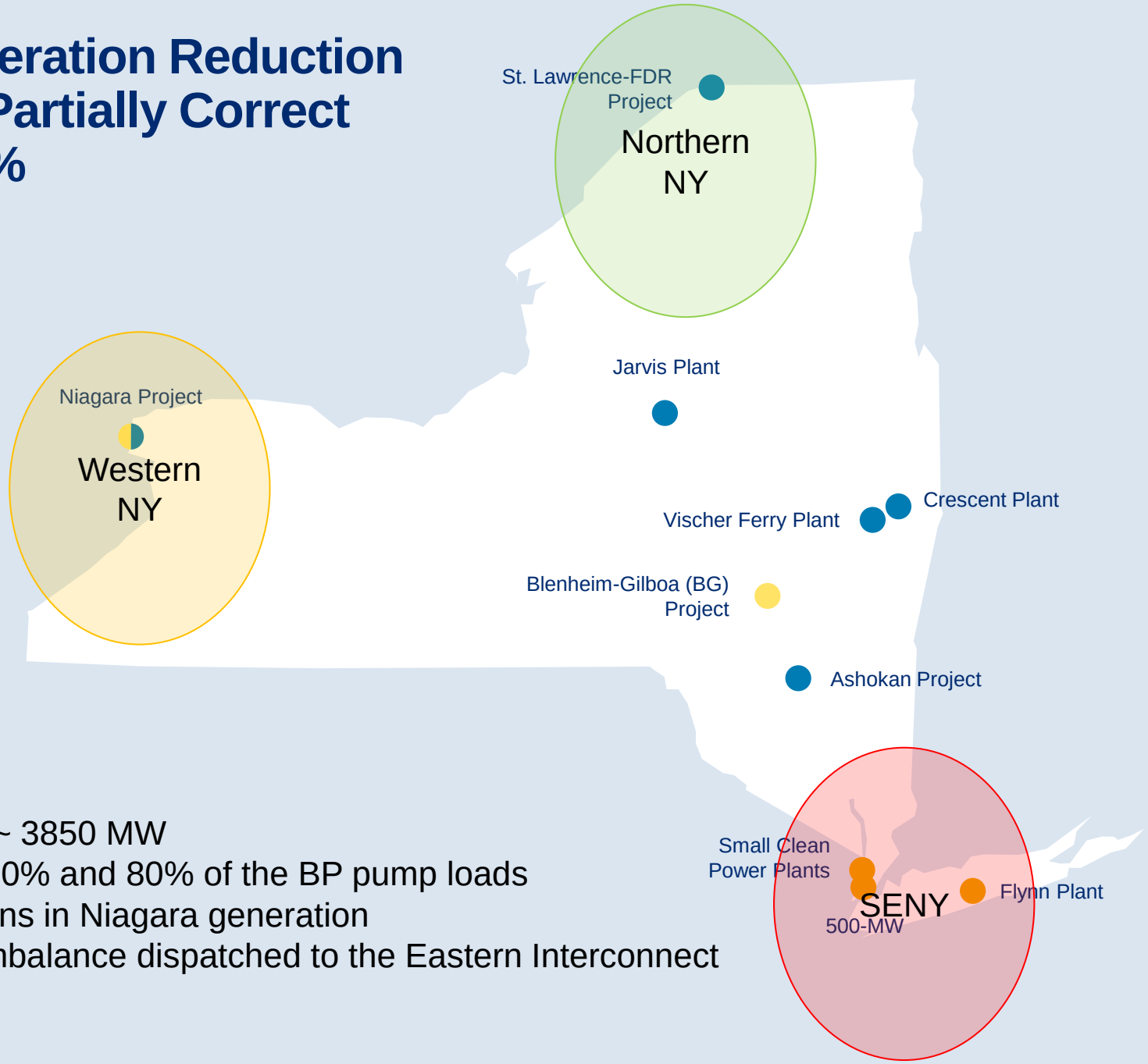
Table 1: All In-Service Screening

Monitored Ckt Name	Monitored Facility	Contingency Name	Base Flow (MVA)	Cont Flow (MVA)	LTE %Loading	STE % Loading
14	137200 EDIC 345 148964 GORDON ROAD 345 1	DCT:EDIC-PRINCETOWN *351 / 352*	904	1563	102	91
UNS-18	137453 N.SCOT99 345 147833 MARCY T1 345 1	DCT:EDIC-PRINCETOWN *351 / 352*	1031	1552	94	79
55	137452 N.SCOT77 345 148965 PRNCTWN 345 1	DCT:PRINCENTOWN-NSCOT *361 / 362*	749	1679	94	87
EF24-40	135205 FRAEDCSC 345 137200 EDIC 345 1	T:EDIC-PRINECTOWN *352* **& UCC2-41**	947	1430	80	80
UCC2-41	147833 MARCY T1 345 148059 MARCCSC1 345 1	T:EDIC-PRINCETOWN *351* **& EF24-40**	1093	1427	80	80
UCC2-41	147833 MARCY T1 345 148059 MARCCSC1 345 1	EDIC-FRASER **EF2-40**	1093	1393	78	78
352	137200 EDIC 345 148965 PRNCTWN 345 2	T:EDIC-PRINCETOWN *352* **& UCC2-41**	999	1487	74	74
351	137200 EDIC 345 148965 PRNCTWN 345 1	T:EDIC-PRINCETOWN *351* **& EF24-40**	997	1460	72	72

Three Different Generation Reduction Scenarios Used to Partially Correct ACE at 50% and 80%

NYPA Operating Facilities by Fuel Type

- Hydro
- Pumped Storage
- Gas



Study Assumptions:

- All Line In-Service
- Central-East stressed to ~ 3850 MW
- Sensitivity analysis with 50% and 80% of the BP pump loads compensated by reductions in Niagara generation
- Remainder of load/gen imbalance dispatched to the Eastern Interconnect

UNS-18 Post-Contingency Loading And Relief

September 30, 2024

UNS-18: Different Dispatch Scenarios For Post-Contingency Loading For The Loss Of *14*

Table 2: Loading Of UNS-18 For The Loss Of *14*					
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
			SENY	West NY	North NY
None	861	1497	1497		
Trip 1 BG Pump			1483	1455	1449
Trip 2 BG Pumps			1471	1416	1404
Trip 3 BG Pumps			1461	1379	1364
Trip 4 BG Pumps			1451	1343	1324

* Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Relief For The Loss Of *14*

Table 3: Load Relief Of UNS-18 For The Loss Of *14*			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	SENY	West NY	North NY
None	-	-	-
Trip 1 BG Pump	14	42	48
Trip 2 BG Pumps	26	81	93
Trip 3 BG Pumps	36	118	133
Trip 4 BG Pumps	46	154	173

* Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Loading For The Loss Of *14*

Table 4: Loading Of UNS-18 For The Loss Of *14*					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	861	1497	1497		
Trip 1 BG Pump			1483	1448	1438
Trip 2 BG Pumps			1471	1402	1385
Trip 3 BG Pumps			1461	1359	1336
Trip 4 BG Pumps			1451	1318	1288

* Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Relief For The Loss Of *14*

Table 5: Load Relief Of UNS-18 For The Loss Of *14*			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	SENY	West NY	North NY
None	-	-	-
Trip 1 BG Pump	14	49	59
Trip 2 BG Pumps	26	95	112
Trip 3 BG Pumps	36	138	161
Trip 4 BG Pumps	46	179	209

* Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Loading For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 6: Loading Of UNS-18 For Tower Contingency Loss Of *351 & 352*					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	1005	1510	1510		
Trip 1 BG Pump			1510	1466	1458
Trip 2 BG Pumps			1510	1424	1410
Trip 3 BG Pumps			1494	1384	1454
Trip 4 BG Pumps			1480	1346	1494

* Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Relief For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 7: Load Relief Of UNS-18 For The Tower Contingency Loss Of *351 & 352*			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	**SENY**	**West NY**	**North NY**
None	-	-	-
Trip 1 BG Pump	16	45	52
Trip 2 BG Pumps	30	86	100
Trip 3 BG Pumps	43	126	144
Trip 4 BG Pumps	56	164	184

* Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Loading For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 8: Loading Of UNS-18 For Tower Contingency Loss Of *351 & 352*					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	1005	1510	1510		
Trip 1 BG Pump			1494	1458	1446
Trip 2 BG Pumps			1480	1410	1390
Trip 3 BG Pumps			1467	1364	1339
Trip 4 BG Pumps			1455	1320	1295

* Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

UNS-18: Different Dispatch Scenarios For Post-Contingency Relief For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 9: Load Relief Of UNS-18 For The Tower Contingency Loss Of *351 & 352*			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	**SENY**	**West NY**	**North NY**
None	-	-	-
Trip 1 BG Pump	16	52	64
Trip 2 BG Pumps	30	100	121
Trip 3 BG Pumps	43	146	172
Trip 4 BG Pumps	56	190	216

* Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

14

Post-Contingency Loading And Relief

September 30, 2024

14: Post-Contingency Loading For The Loss Of UNS-18

Table 10: Loading Of *14* For Tower Contingency Loss Of UNS-18					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	861	1050	1050		
Trip 1 BG Pump			1041	1023	1019
Trip 2 BG Pumps			1032	998	991
Trip 3 BG Pumps			1023	976	959
Trip 4 BG Pumps			1014	956	899

- Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas
- * Tower Loss of the UNS-18 & Porter-12 lines has the same loading the loss UNS-18 alone

14: Post-Contingency Relief For The Loss Of UNS-18

Table 11: Load Relief Of *14* For The Tower Contingency Loss Of UNS-18			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	SENY	West NY	North NY
None	-	-	-
Trip 1 BG Pump	9	27	30
Trip 2 BG Pumps	18	51	58
Trip 3 BG Pumps	27	73	90
Trip 4 BG Pumps	36	93	120

- Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas
- * Tower Loss of the UNS-18 & Porter-12 lines has the same loading the loss UNS-18 alone

14: Post-Contingency Loading For The Loss Of UNS-18

Table 12: Loading Of *14* For Tower Contingency Loss Of UNS-18					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	861	1050	1050		
Trip 1 BG Pump			1046	1019	1012
Trip 2 BG Pumps			1044	989	979
Trip 3 BG Pumps			1041	961	984
Trip 4 BG Pumps			1038	934	917

- Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas
- * Tower Loss of the UNS-18 Porter-12 lines has the same loading the loss UNS-18 alone

14: Post-Contingency Relief For The Loss Of UNS-18

Table 13: Load Relief Of *14* For The Tower Contingency Loss Of UNS-18			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	**SENY**	**West NY**	**North NY**
None	-	-	-
Trip 1 BG Pump	3	31	37
Trip 2 BG Pumps	6	60	71
Trip 3 BG Pumps	9	88	103
Trip 4 BG Pumps	12	115	133

- Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas
- * Tower Loss of the UNS-18 Porter-12 lines has the same loading the loss UNS-18 alone

14: Different Dispatch Scenarios For Post-Contingency Loading For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 14: Loading Of *14* For Tower Contingency Loss Of *351 & 352*					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	861	1497	1497		
Trip 1 BG Pump			1483	1455	1449
Trip 2 BG Pumps			1471	1416	1404
Trip 3 BG Pumps			1461	1379	1364
Trip 4 BG Pumps			1451	1343	1324

* Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas

14: Different Dispatch Scenarios For Post-Contingency Relief For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 15: Load Relief Of 14 For The Tower Contingency Loss Of *351 & 352*			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	**SENY**	**West NY**	**North NY**
None	-	-	-
Trip 1 BG Pump	14	42	48
Trip 2 BG Pumps	26	81	93
Trip 3 BG Pumps	36	118	133
Trip 4 BG Pumps	46	154	173

- Post-contingency MVA relief when 50% of the pump load lost is offset by decreases in Different Areas

14: Different Dispatch Scenarios For Post-Contingency Loading For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 16: Loading Of *14* For Tower Contingency Loss Of *351 & 352*					
			5 Min Contingency Flow After BG Pump Drop and ACE correction (MVA)		
Mitigation Action	Base Flow (MVA)	Initial Contingency Flow (MVA)	SENY	West NY	North NY
None	861	1497	1497		
Trip 1 BG Pump			1483	1448	1438
Trip 2 BG Pumps			1471	1402	1385
Trip 3 BG Pumps			1461	1359	1336
Trip 4 BG Pumps			1451	1318	1288

* Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

14: Different Dispatch Scenarios For Post-Contingency Relief For The Proposed Additional Tower Contingency Loss Of *351 & 352*

Table 17: Load Relief Of *14* For The Tower Contingency Loss Of *351 & 352*			
	Total Relief Per Dispatch: (MVA)		
Mitigation Action	**SENY**	**West NY**	**North NY**
None	-	-	-
Trip 1 BG Pump	14	49	59
Trip 2 BG Pumps	26	95	112
Trip 3 BG Pumps	36	138	161
Trip 4 BG Pumps	46	179	209

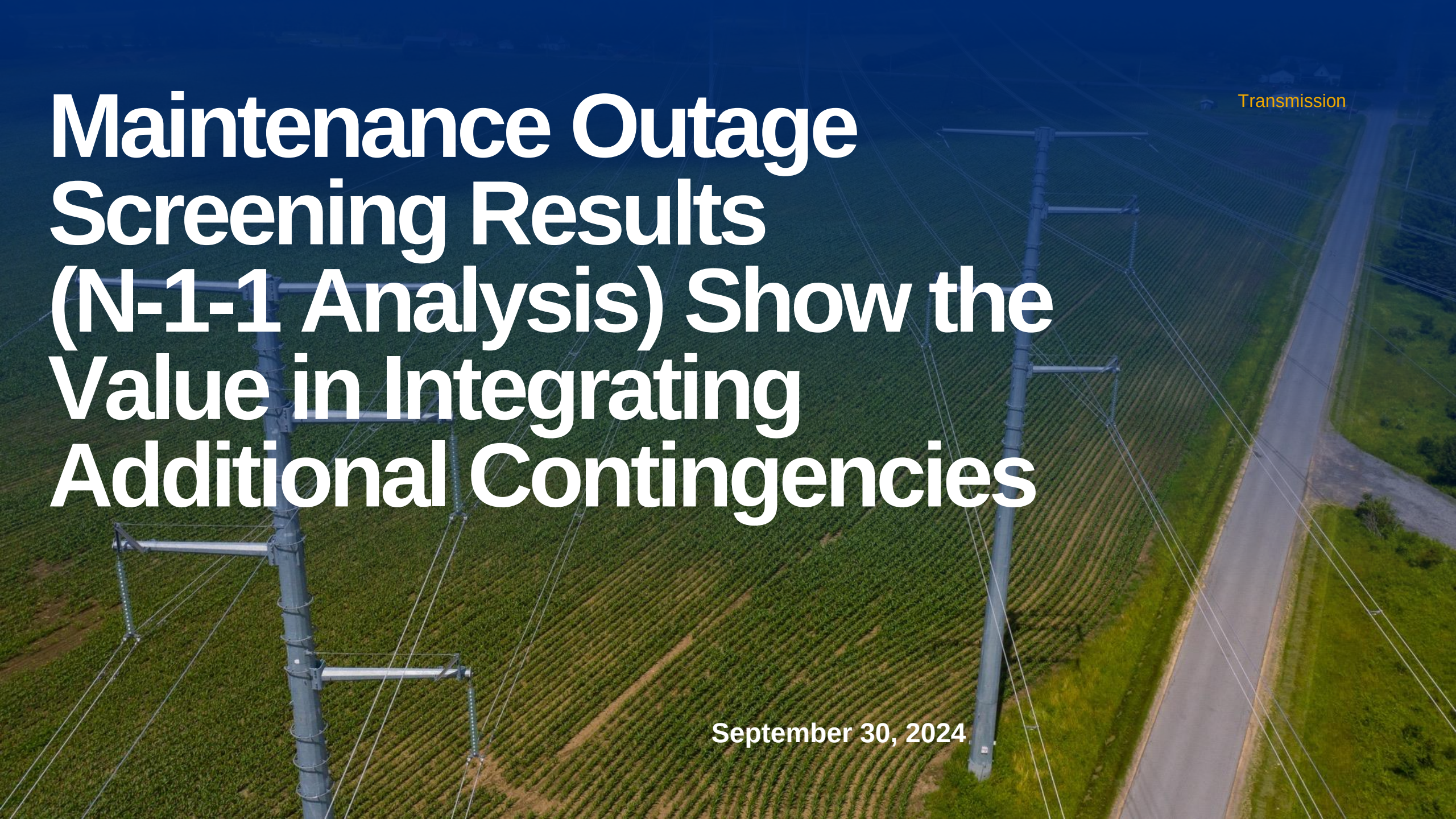
- Post-contingency MVA relief when 80% of the pump load lost is offset by decreases in Different Areas

Post-Contingency MVA Relief Expected From Tripping BG Pumps

This table shows a reasonable range of relief when 50% to 80% of the +ACE due to tripped pumps is corrected within Western NY State, with the Eastern Interconnect picking up the Remaining Discrepancy.

Table 26: Range Of Relief Per Number Of BG Pumps Dropped (MVA)

Relief On	UNS-18		14	
BG Pumps Tripped	Loss of 14	Tower 351 & 352	Loss of UNS-18 or Tower UNS-18 & P12	Tower 351 & 352
1	32 – 38	16 – 64	3 – 37	14 – 59
2	64 – 74	30 – 112	6 – 71	26 – 112
3	93 – 109	43 – 172	9 – 103	36 – 161
4	122 – 143	56 – 216	12 – 133	46 – 209



Transmission

Maintenance Outage Screening Results (N-1-1 Analysis) Show the Value in Integrating Additional Contingencies

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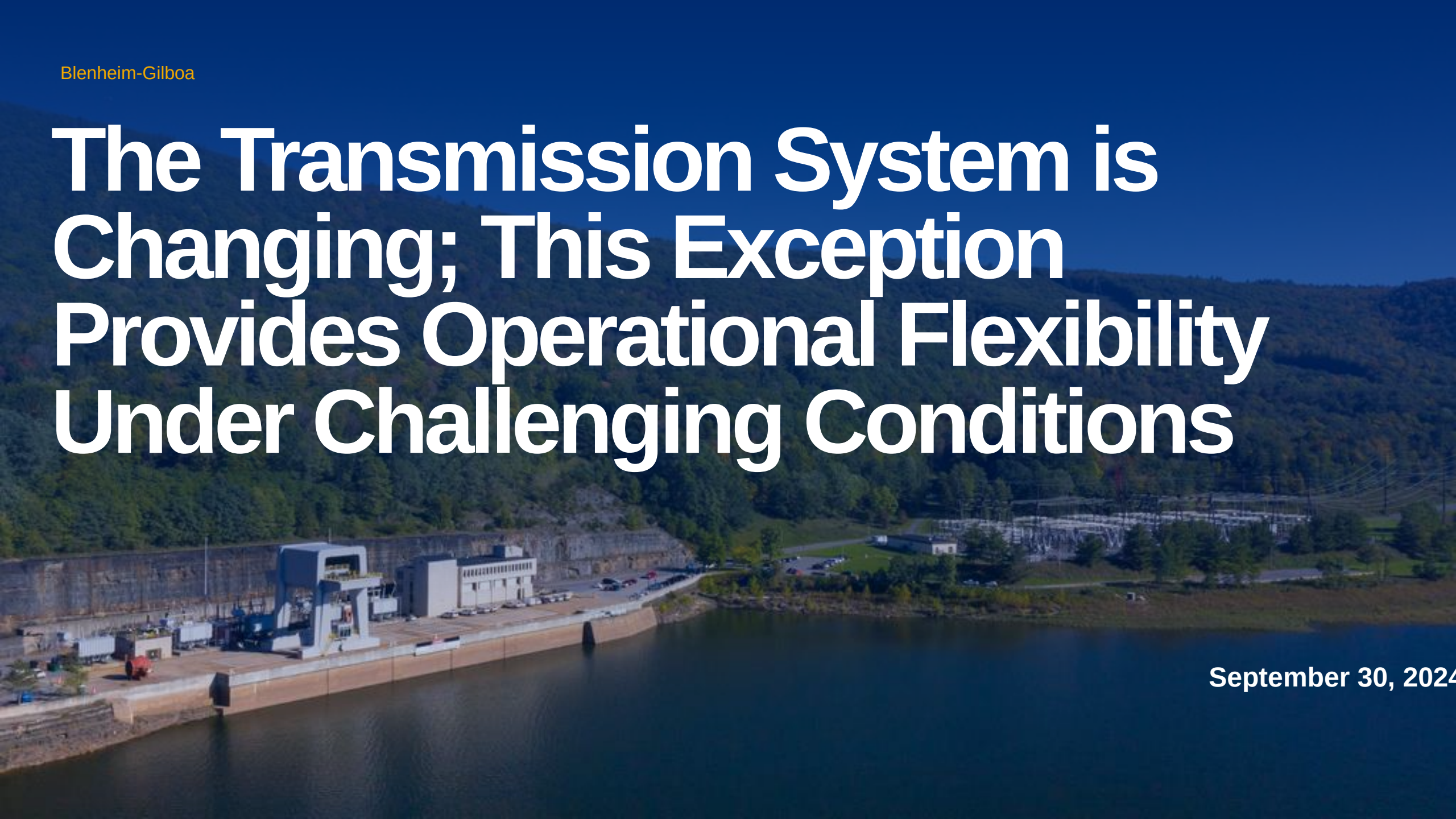
N-1-1 Results

Table 27: Maintenance Screening

Maintenance Outage Scenario	Monitored Circuit	Contingency Name	Base Flow (MVA)	Cont Flow (MVA)	% LTE	% STE
NSCOT345BS77	UNS-18	T: Edic - Princetown *352* & 41	1239	1635	99.1	83.0
NSCOT345BS77	UNS-18	T: Edic - Princetown *351* & 40	1239	1617	98.0	82.0
NSCOT345BS77	EF24-40	T: Edic - Princetown *352* & 41	1205	1734	96.7	96.7
DCT:PRINCNTWN-NSCOT *361/362*	UNS-18	**T: Edic - Princetown *351 & 352***	1160	1573	95.4	79.8
NSCOT345BS66K	UNS-18	**T: Edic - Princetown *351 & 352***	1142	1563	94.7	79.3
DCT:PRINCNTWN-NSCOT *361/362*	UNS-18	T: Edic - Princetown *352* & 41	1160	1557	94.4	79.0
NSCOT345BS66K	UNS-18	T: Edic - Princetown *352* & 41	1142	1551	94.0	78.7
NSCOT345BS66K	UNS-18	New Scot 345 Bus 77	1142	1550	93.9	78.6
NSCOT345BS77	UNS-18	**T: Edic - Princetown *351 & 352***	1239	1543	93.5	78.3
NSCOT345BS66K	***14***	**T: Edic - Princetown *351 & 352***	778	1432	93.1	83.1
DCT:PRINCNTWN-NSCOT *361/362*	***14***	**T: Edic - Princetown *351 & 352***	781	1431	93.1	83.0
NSCOT345BS77	UNS-18	New Scot 345 Bus 66K	1239	1535	93.1	77.9
NSCOT345BS66K	EF24-40	T: Edic - Princetown *352* & 41	1153	1665	92.9	92.9
DCT:PRINCNTWN-NSCOT *361/362*	UNS-18	New Scot 345 Bus 77	1160	1532	92.9	77.7
DCT:PRINCNTWN-NSCOT *361/362*	UNS-18	T: Edic - Princetown *351* & 40	1160	1526	92.5	77.4
NSCOT345BS66K	UNS-18	T: Edic - Princetown *352* & 41	1142	1518	92.0	77.0

Blenheim-Gilboa

The Transmission System is Changing; This Exception Provides Operational Flexibility Under Challenging Conditions



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Tripping B-G Pumping Loads Remains Effective in Reducing Overloads

The steady-state analysis shows removing B-G pumping load remains an effective method for decreasing west-to-east flows from Central New York to the Capital District.

Proposed Exception #1 To Reliability RULES: Post Contingency Flow on Marcy-New Scotland

- The post-contingency flow on the ***Marcy-New Scotland 18*** line is allowed to exceed its LTE rating **for the loss** of the ***Edic-Gordon Road 14*** line or the **double-circuit loss** of the ***Edic-Princetown 351 and 352,*** by the amount of relief that can be obtained by tripping the Gilboa pumping load as a single corrective action.

- Also, the post-contingency flow on the ***Edic-Gordon Road 14*** line is allowed to exceed its LTE rating for **either the loss** of the ***Marcy-New Scotland 18*** line alone, or the **double-circuit loss** of the ***Marcy-New Scotland 18*** **and** ***Adirondack-Porter 12*** lines, or the **double-circuit loss** of the ***Edic-Princetown 351 and 352*** by the amount of relief that can be obtained by tripping the Gilboa pumping load as a single corrective action.

NYSRC Reliability Rule C.1

Contact Info

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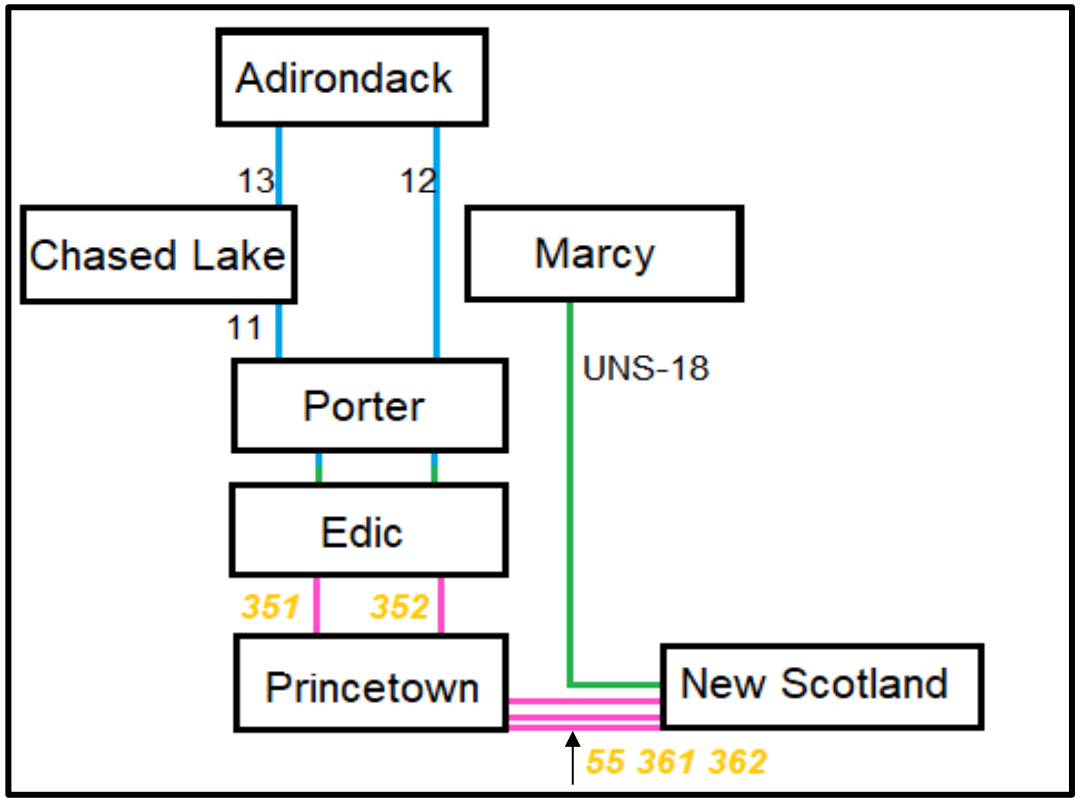
Northern New York to Central East Topology



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Thank You