



CENTRAL EAST STABILITY LIMIT ANALYSIS FOR ALL LINES IN- SERVICE AND OUTAGE CONDITIONS (CE-22)

A Report by the
New York Independent System Operator

April 2022

Executive Summary

This study was conducted to examine the stability limits for the Central East interface to determine the impact of the Porter – Rotterdam (30) 230 kV and Porter – Rotterdam (31) 230 kV lines that are being decommissioned as part of the Segment A construction along with the addition of the new Gordon Road 345 kV substation. The new Central East interface is defined in Table 4 and illustrated in Figure 1.

The limits recommended in this report are based on a stable system response at the highest transfer level tested. There were no instances of any system or unit instability observed.

It is recommended that the Central East stability transfer limits be updated as reported in Table 1, 2 and 3.

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Summary of Proposed Limits

The proposed All Lines in-service limit revisions and the magnitude of the changes are presented in Table 1, below:

Oswego	Site	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
5	5	3100	2750	-350	3000	2700	-300	2950	2700	-250	3100	2800	-300	3100	2800	-300	3100	2800	-300
	3	3050	2700	-350	2950	2650	-300	2850	2650	-200	3050	2750	-300	3050	2700	-350	3050	2700	-350
	0	2900	2550	-350	2850	2550	-300	2850	2550	-300	2900	2650	-250	2900	2600	-300	2900	2600	-300
4	5	3050	2650	-400	2950	2650	-300	2950	2650	-300	3100	2700	-400	3100	2700	-400	3100	2700	-400
	3	3050	2600	-450	2950	2600	-350	2900	2600	-300	3050	2650	-400	3050	2650	-400	3050	2650	-400
	0	2850	2450	-400	2800	2400	-400	2700	2400	-300	2850	2550	-300	2850	2500	-350	2850	2500	-350
3	5	3050	2600	-450	2950	2550	-400	2950	2550	-400	3050	2650	-400	3050	2600	-450	3050	2600	-450
	3	3000	2550	-450	2950	2500	-450	2900	2500	-400	3050	2600	-450	3050	2600	-450	3050	2600	-450
	0	2800	2350	-450	2700	2250	-450	2700	2200	-500	2900	2500	-400	2900	2450	-450	2900	2450	-450
2	5	3000	2500	-500	2900	2450	-450	2850	2450	-400	3050	2600	-450	3050	2550	-500	3050	2550	-500
	3	2900	2400	-500	2850	2350	-500	2800	2350	-450	2950	2500	-450	2950	2500	-450	2950	2500	-450
	0	2750	2200	-550	2700	2150	-550	2650	2150	-500	2800	2350	-450	2800	2300	-500	2800	2300	-500
1	5	2650	2400	-250	2650	2350	-300	2650	2350	-300	2900	2500	-400	2900	2500	-400	2900	2500	-400
	3	2450	2250	-200	2450	2200	-250	2450	2200	-250	2750	2350	-400	2750	2350	-400	2750	2350	-400
	1	2400	2000	-400	2400	2000	-400	2400	1950	-450	2550	2150	-400	2550	2100	-450	2550	2100	-450
0	5	2200	2000	-200	2200	2000	-200	2200	2000	-200	2400	2200	-200	2400	2150	-250	2400	2150	-250
	3	2000	1850	-150	2000	1850	-150	2000	1850	-150	2200	2000	-200	2200	2000	-200	2200	2000	-200
	0	1750	1600	-150	1750	1600	-150	1750	1600	-150	1900	1800	-100	1950	1750	-200	1950	1750	-200

Table 1: Proposed All Lines In-service Limit Revisions

The proposed line outage limit revisions and the magnitude of the changes are presented in Table 2, below:

Massena - Marcy (MSU1) 765 kV Out-of-Service

Oswego	Sithe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2650	2100	-550	2650	2050	-600	2650	2050	-600	2650	2150	-500	2650	2150	-500	2650	2150	-500
	3	2500	2000	-500	2500	2000	-500	2500	2000	-500	2500	2050	-450	2500	2050	-450	2500	2000	-500
	0	2200	1850	-350	2200	1850	-350	2200	1850	-350	2200	1850	-350	2200	1850	-350	2200	1850	-350
2	5	2300	1950	-350	2300	1950	-350	2300	1950	-350	2300	1950	-350	2300	1950	-350	2300	1950	-350
	3	2100	1850	-250	2100	1850	-250	2100	1800	-300	2100	1850	-250	2100	1850	-250	2100	1850	-250
	0	1850	1650	-200	1850	1650	-200	1850	1650	-200	1850	1650	-200	1850	1650	-200	1850	1650	-200

Oakdale - Fraser (32) 345 kV Out-of-Service

Oswego	Sithe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	3000	2550	-450	2900	2550	-350	2850	2550	-300	3000	2650	-350	3000	2600	-400	2950	2600	-350
	3	2950	2450	-500	2900	2450	-450	2850	2400	-450	3000	2600	-400	3000	2550	-450	2950	2550	-400
	0	2750	2200	-550	2750	2200	-550	2650	2150	-500	2850	2400	-450	2850	2350	-500	2800	2300	-500
2	5	3000	2500	-500	2850	2450	-400	2800	2450	-350	3050	2600	-450	3000	2550	-450	3000	2550	-450
	3	2900	2400	-500	2800	2400	-400	2750	2400	-350	2950	2500	-450	2950	2500	-450	2950	2500	-450
	0	2750	2150	-600	2650	2100	-550	2600	2100	-500	2800	2350	-450	2800	2300	-500	2800	2300	-500

Clarks Corners - Oakdale (36) 345 kV Out-of-Service

Oswego	Site	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2850	2550	-300	2750	2500	-250	2700	2500	-200	2850	2600	-250	2850	2600	-250	2800	2600	-200
	3	2800	2450	-350	2750	2450	-300	2700	2450	-250	2850	2550	-300	2850	2500	-350	2800	2500	-300
	0	2600	2200	-400	2600	2200	-400	2500	2150	-350	2700	2400	-300	2700	2300	-400	2650	2300	-350
2	5	2850	2450	-400	2700	2450	-250	2650	2450	-200	2900	2550	-350	2850	2550	-300	2850	2550	-300
	3	2750	2300	-450	2650	2300	-350	2600	2300	-300	2800	2450	-350	2800	2400	-400	2800	2400	-400
	0	2600	2050	-550	2500	2050	-450	2450	2050	-400	2650	2200	-450	2650	2150	-500	2650	2150	-500

Lafayette - Clarks Corners (4-46) 345 kV Out-of-Service

Oswego	Site	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2850	2500	-350	2750	2450	-300	2700	2450	-250	2850	2600	-250	2850	2600	-250	2800	2600	-200
	3	2800	2400	-400	2750	2400	-350	2700	2350	-350	2850	2500	-350	2850	2500	-350	2800	2500	-300
	0	2600	2150	-450	2600	2150	-450	2500	2150	-350	2700	2350	-350	2700	2350	-350	2650	2300	-350
2	5	2850	2450	-400	2700	2400	-300	2650	2400	-250	2900	2550	-350	2850	2500	-350	2850	2500	-350
	3	2750	2300	-450	2650	2300	-350	2600	2250	-350	2800	2400	-400	2800	2400	-400	2800	2400	-400
	0	2600	2050	-550	2500	2050	-450	2450	2000	-450	2650	2200	-450	2650	2150	-500	2650	2150	-500

Marcy - New Scotland (18) 345 kV Out-of-Service

Oswego	Site	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2050	1650	-400	1700	1650	-50	1700	1650	-50	2050	1700	-350	1700	1700	0	1700	1700	0
	3	N/A	1650		N/A	1650		N/A	1650		N/A	1650		N/A	1650		N/A	1650	
	0	N/A	1600		N/A	1550		N/A	1550		N/A	1600		N/A	1600		N/A	1600	
2	5	2050	1650	-400	1700	1650	-50	1700	1650	-50	2050	1700	-350	1700	1650	-50	1700	1650	-50
	3	N/A	1600		N/A	1600		N/A	1600		N/A	1650		N/A	1650		N/A	1650	
	0	N/A	1600		N/A	1600		N/A	1600		N/A	1600		N/A	1600		N/A	1600	

Table 2: Proposed Outage Limit Revisions

The proposed new Line outage limit revisions and the magnitude of the changes are presented in Table 3, below:

Edic - Gordon Rd (14) 345 kV Out-of-Service																			
Oswego	Stlbe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2050	1800	-250	1700	1800	100	1700	1800	100	2050	1850	-200	1700	1850	150	1700	1850	150
	3	N/A	1750		N/A	1750		N/A	1750		N/A	1800		N/A	1800		N/A	1800	
	0	N/A	1500		N/A	1400		N/A	1400		N/A	1700		N/A	1650		N/A	1650	
2	5	2050	1750	-300	1700	1750	50	1700	1750	50	2050	1800	-250	1700	1800	100	1700	1800	100
	3	N/A	1700		N/A	1650		N/A	1650		N/A	1750		N/A	1750		N/A	1750	
	0	N/A	1500		N/A	1400		N/A	1400		N/A	1700		N/A	1650		N/A	1650	
Gordon Rd - New Scotland (55) 345 kV Out-of-Service																			
Oswego	Stlbe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	N/A	2400		N/A	2350		N/A	2350		N/A	2450		N/A	2450		N/A	2450	
	3	N/A	2250		N/A	2200		N/A	2200		N/A	2400		N/A	2400		N/A	2400	
	0	N/A	2000		N/A	2000		N/A	1950		N/A	2200		N/A	2150		N/A	2150	
2	5	N/A	2400		N/A	2350		N/A	2350		N/A	2400		N/A	2400		N/A	2400	
	3	N/A	2200		N/A	2150		N/A	2150		N/A	2350		N/A	2350		N/A	2350	
	0	N/A	1850		N/A	1850		N/A	1800		N/A	2150		N/A	2100		N/A	2100	

Table 3: Proposed New Line Outage Limit Revisions

Introduction

This study serves as a review of Central East stability limits for the Porter – Rotterdam (30) 230 kV and Porter – Rotterdam (31) 230 kV lines being decommissioned as part of the Segment A construction, along with the addition of the new Gordon Road 345 kV substation.

This study provides recommendations to update the Central East stability transfer limits for the All Lines In-Service scenarios as per Table 1 and outage conditions as per Table 2 and 3.

System Operating Limit Methodology

The “NYSRC Reliability Rules for Planning and Operating the New York State Power System” (NYSRC Reliability Rules) provides the methodology for developing System Operating Limits (SOLs) within the NYISO Reliability Coordinator Area. NYSRC Reliability Rules require compliance with all North American Electric Reliability Corporation (NERC) Standards and Northeast Power Coordinating Council (NPCC) Standards and Criteria. Rule C.1 of the NYSRC Reliability Rules sets forth the contingencies to be evaluated and the performance requirements to be applied in developing SOLs. Rule C.1 also incorporates NYISO Transmission Planning Guideline #3-1, the “Guideline for Stability Analysis and Determination of Stability-Based Transfer Limits” found in Attachment H to the NYISO “Transmission Expansion and Interconnection Manual.”

Interface Summary

The new Central East interface definition is given below in Table 4 and illustrated in Figure 1.

Central East		
Mohawk Valley (Zone E) – Capital (Zone F)		
Name	Line ID	Voltage (kV)
Edic-Gordon Rd.*	14	345
Marcy-New Scotland*	18	345
East Springfield-Inghams*	7-942	115
Inghams PAR*	PAR	115
Inghams Bus Tie*	R81	115
North (Zone D) – ISONE (Zone N)		
*Plattsburgh-Sand Bar	PV20	115

* indicates the metered end of the circuit

Table 4. Central East Interface Definition

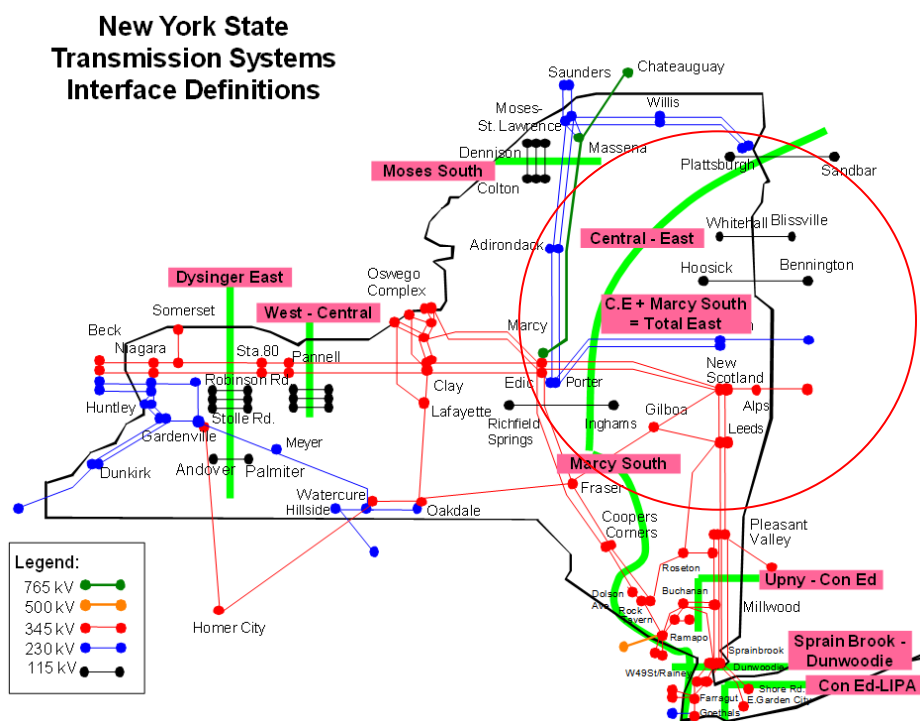


Figure 1. NYCA Transmission System Interface (Central East inset)

System Representation and Transfer Case Development

The analysis was based on the 2021 NYISO Dynamics Base Case, which was developed from the 2021 MMWG Dynamics Base Case with the NYISO representation updated to reflect the results of the NYISO 2021 Summer Operating Study. The Summer 2021 Operating Study was updated to include the 2022 network configuration of the Segment A project and the completed Empire State Line Alternative Project.

The base case model includes:

- the NYISO Transmission Operator area;
- all Transmission Operator areas contiguous with NYISO;
- all system elements modeled as in-service;
- all generation represented;
- phase shifters in the regulating mode;
- the NYISO Load Forecast;
- transmission facility additions and retirements;
- generation facility additions and retirements;
- Remedial Action Scheme (RAS) models currently existing or projected for implementation within the studied time horizon;
- series compensation for each line at the expected operating level; and
- facility ratings as provided by the Transmission Owner and Generator Owner

Central East transfers were developed from generation shifts between IESO and NYISO West (Zone A) through Central (Zone C) to Capital (Zone F), and ISO New England. The base case was established with a high transfer on Dysinger East (> 2900 MW), Moses South (> 2700 MW) and NY-ISO-NE (>1500MW).

The units included in the Oswego Complex are Nine Mile 1, Nine Mile 2, Fitzpatrick, Oswego 5 and Oswego 6. When this report refers to Oswego units it is referring to these units. The large combined cycle plant in the Oswego area is referred to as Sithe, and accounted for separately.

This study was performed with Chateauguay HVDC terminals taken out-of-service with the Chateauguay transfers maintained with the Beauharnois units and the Marcy South Series Compensation was modeled out-of-service. When the Fraser SVC, Leeds SVC and Marcy FACTs were modeled in-service,

the base case load flow were solved with the SVCs/FACTS set to minimum (0MVar) output by adjusting their respective voltage schedules in the pre-contingency case.

Tested Contingencies

Sixty-four (64) contingencies were tested for Central East transfer case scenario. Table 5 provides the identification and description of these contingencies.

Table 5. Contingencies Applied for Evaluating Central East Stability Transfer Limits		
#	ID	Description
1	CE02.IDV	3PH-NC@MARCY345 – L/O MARCY-N.SCOTLAND (UNS-18) W/RCL
2	CE03.IDV	SLG-STK@EDIC345 (BKR R935) – L/O EDIC-N.SCOT #14 / BKUP CLR FE1
3	CE05.IDV	3PH-NC@EDIC345 – L/O EDIC-MARCY UE1-7
4	CE06.IDV	3PH-NC@MARCY345 – L/O EDIC-MARCY (UE1-7)
5	CE07.IDV	LLG@MARCY/EDIC - L/O MARCY-COOPERS (UCC2-41) & EDIC-FRASER (EF24-40) DCT
6	CE07AR.IDV	LLG@MARCY/EDIC - L/O MARCY-COOPERS (UCC2-41) & EDIC-FRASER (EF24-40) DCT W/RCL
7	CE08.IDV	LLG@COOPERS - L/O MARCY-COOPERS (UCC2-41)/FRASER-COOPERS (FCC33) DCT
8	CE08AR.IDV	LLG@COOPERS – L/O MARCY-COOPERS (UCC2-41)/FRASER-COOPERS (FCC33) DCT W/RCL
9	CE09_AC-SegA.IDV	SLG-STK@EDIC345KV – L/O FITZ-EDIC #FE-1/BKUP CLR#14
10	CE10.IDV	SLG-STK@MARCY345 (BKR3308) – L/O MARCY-N.SCOT (UNS-18)
11	CE11.IDV	SLG-STK@FRASER345 (BKR B1/3562) – L/O FRASER-GILBOA (GF-5)
12	CE12_AC-SegA.IDV	3PH-NC@NSCOT345 – L/O EDIC-N.SCOT #14 W/H.S RCL
13	CE13.IDV	3PH-NC@VOLNEY345 – L/O VOLNEY-MARCY (VU-19)
14	CE14.IDV	3PH-NC@MARCY345 – L/O VOLNEY-MARCY (VU-19)
15	CE15.IDV	SLG-STK@MARCY345(BKR 3108) – L/O VOLNEY-MARCY (VU-19) / BKUP CLR#UE1-7
16	CE16.IDV	SLG-STK@EDIC345 (BKR R915) – L/O EDIC-FRASER (EF24-40) / BKUP CLR#2-15
17	CE17.IDV	SLG-STK@MARCY(BKR 3208)- L/O MARCY-COOPERS(UCC2-41)
18	CE18AR-UC30AR.IDV	LLG@ROCK – L/O CPV (DOLSON) - ROCK TAVERN DCT W/ RCL
19	CE18-UC30.IDV	LLG@ROCK – L/O CPV (DOLSON) - ROCK TAVERN DCT
20	CE19.IDV	LLG@COOPERS – L/O COOPERS CORNERS- CPV_VALY(DOLSON) DCT
21	CE19AR.IDV	LLG@COOPERS – L/O COOPERS CORNERS-CPV_VALY(DOLSON) DCT W/ RCL
22	CE20.IDV	SLG-STK@EDIC345 (BKR R70) – L/O EDIC-MARCY UE1-7/ BKUP CLR EDIC T4 (WithT2 Moved)
23	CE21.IDV	SLG-STK@FRASER – L/O FRASER-COOPERS 33 / BKUP CLR#32@OAKDALE
24	CE21OAK.IDV	TEXT, SLG-STK@FRASER – L/O FRASER-COOPERS 33 / BKUP CLR#32@OAKDALE
25	CE22.IDV	3PH-NC@EDIC345 – L/O EDIC-FRASER EF-24/40
26	CE22AR.IDV	3PH-NC@EDIC345 – L/O EDIC-FRASER EF-24/40 W/RCL@FRASER
27	CE23.IDV	LLG@FRASER – L/O MARCY-COOPERS(UCC2-41)/EDIC-FRASER(EF24-40) DCT
28	CE23AR.IDV	LLG@FRASER – L/O MARCY-COOPERS(UCC2-41)/EDIC-FRASER(EF24-40) DCT W/RCL

29	CE24.IDV	3PH-NC@FRASER – L/O FRASER-COOPERS CORNERS FCC-33
30	CE24AR.IDV	3PH-NC@FRASER – L/O FRASER-COOPERS CORNERS FCC-33 W/RCL
31	CE25.IDV	3PH-NC@COOPERS – L/O FRASER-COOPERS CORNERS FCC-33
32	CE25AR.IDV	3PH-NC@COOPERS – L/O FRASER-COOPERS CORNERS FCC-33 W/RCL
33	CE26.IDV	3PH-NC@COOPERS – L/O MARCY-COOPERS CORNERS UCC-2/41
34	CE26AR.IDV	3PH-NC@COOPERS – L/O MARCY-COOPERS CORNERS UCC-2/41 W/RCL
35	CE27.IDV	3PH-NC@COOPERS – L/O COOPERS CORNERS- ROCK TAVERN CCRT-34
36	CE27AR.IDV	3PH-NC@COOPERS – L/O COOPERS CORNERS-ROCK TAVERN CCRT-34 W/RCL
37	CE28.IDV	3PH-NC@COOPERS – L/O COOPERS CORNERS-CPV_VALY(DOLSON) CCRT-42
38	CE28AR.IDV	3PH-NC@COOPERS – L/O COOPERS CORNERS-CPV_VALY(DOLSON) CCRT-42 W/RCL
39	CE29.IDV	3PH-NC@CPV – L/O CPV_VALY(DOLSON AVE)- ROCK TAV DART-44
40	CE30.IDV	3PH-NC@ROCK – L/O ROCK TAVERN-CPV_VALY (DOLSON AVE) DART-44
41	CE32.IDV	3PH-NC@FRASER – L/O EDIC - FRASER EF-24/40
42	CE32AR.IDV	3PH-NC@FRASER – L/O EDIC - FRASER EF-24/40 W/RCL
43	CE33.IDV	3PH-NC@FITZ – L/O EDIC - FITZPATRICK FE-1
44	CE34.IDV	3PH-NC@SCRIBA 345KV JA FITZP-SCRIBA #10 NORMALLY CLEARED
45	CE35.IDV	3PH-NC@JA FITZP 345KV JA FITZP-SCRIBA #10 NORMALLY CLEARED
46	CE36.IDV	SLG--STK@SCRIBA345 (BKR R100)/SCRIBA-FITZ #10/ BKUP CLR SCRIBA 345-SCRIBA 115 XFMR
47	CE37_NM2-L23.IDV	3PH@Nine Mile 2 on line 23 from Nine Mile 2 to Scriba with failure of A Package Protection - Using conservative B Package clearing times
48	CE99.IDV	SLG-STK@SCRIBA345 (BKR R935) – L/O SCRIBA-VOLNEY 21 / BKUP CLR FITZ-SCRIBA #10
49	MS02.IDV	3PH-NC@MOSES230 – L/O MOSES-ADIR W/NO REJ.
50	MS150.IDV	LLG@MOSES230 – L/O MOSES-ST.LAWRENCE L33/34P DCT W/NO REJ
51	NE01.IDV	3PH-NC@SEABROOK345 – L/O SEABROOK G1
52	NE03.IDV	L/O PHASE II INTERCONNECTION W/O FAULT (N-1)
53	SA01_Q556.idv	SLG-STK@EDIC345 (BKR R915) – L/O EDIC-FRASER (EF24-40) / BKUP CLR#2-15
54	SA02_Q556.idv	SLG-STK@N. SCOTLAND 345KV (BKR 3) – L/O N.SCOTLAND - ROTTERDAM
55	SA03_Q556.idv	3PH-NC@EDIC345 – L/O EDIC-ROTTERDAM
56	SA04_Q556.idv	3PH-NC@ROTTERDAM345 – L/O EDIC-ROTTERDAM
57	SA05_Q556.idv	3PH-NC@NSCOT345 – L/O ROTTERDAM -N.SCOT #14 W/H.S RCL
58	SA06_Q556.idv	3PH-NC@ ROTTERDAM – L/O N.SCOTAND 77 - ROTTERDAM W/RCL
59	SA07_Q556.idv	3PH-NC@N.SCOTLON.SCOT-LEEDS93WHSRCL
60	SA10_Q556.idv	SLG-STK@EDIC345 (BKR R1) – L/O EDIC- ROTTERDAM
61	SA11_Q556.idv	3PH-NC@EDIC345 – L/O EDIC- ROTTERDAM
62	SA15_Q556.idv	3PH-NC@ROTTERDAM – L/O EDIC- ROTTERDAM
63	SA18_Q556.idv	3PH-NC@ROTTERDAM – L/O EDIC-N.SCOTLAND 77
64	SA22_Q556.idv	3PH-NC@N.SCOTLAND 77 – L/O ROTTERDAM-N.SCOTLAND 77

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for each Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service. The contingencies that resulted in the largest oscillation of machine angles or caused

instability were employed to determine all the proposed limits presented on Table 6 Updates to Existing All Lines In-Service Stability Limits.

The most severe contingency related to Central East stability is CE09_AC-SegA, a single line to ground fault at Edic 345 kV which results in the loss of Fitzpatrick – Edic (FE-1) 345kV and the back-up clearing of the Edic – Gordon Road (14) 345 kV line. Other contingencies that merit monitoring on Central East are CE03, CE06, CE36, CE99 and SA01_Q556. Contingencies CE03 with a single line to ground fault at Edic 345 kV, CE06 with 3 phase fault at Marcy 345 kV, CE36 with a single line to ground fault at Scriba 345 kV, CE99 with a single line to ground fault at Scriba 345 kV and SA01_Q556 with a single line to ground fault at Edic 345 kV.

Monitored Elements

In order to assess system stability response for the Central East power transfer scenarios including contingencies, the following parameters were monitored and analyzed:

- generators' angles, power outputs, terminal voltages, and speeds in the following areas/zones (West, Central, Capital, North); and
- bus voltages and frequencies around Central East, Moses South, Dysinger East and NYISO-ISO-NE interfaces.

The recommended limits in this report are all based on stable system response at the highest transfer level tested. There were no instances of any system or unit instability observed in any of the simulations.

Discussion

General Comments

Angle and Voltage Monitoring

Machine angles and bus voltages were employed in this analysis as the key indicators of system stability. The discussions that follow include representative plots of generation unit angle response for illustration purposes. Similar plots are included in the appendix for all simulations conducted. The recommended limits in this report are all based on stable system response at the highest transfer level tested. There were no instances of any system or unit instability observed in any of the simulations.

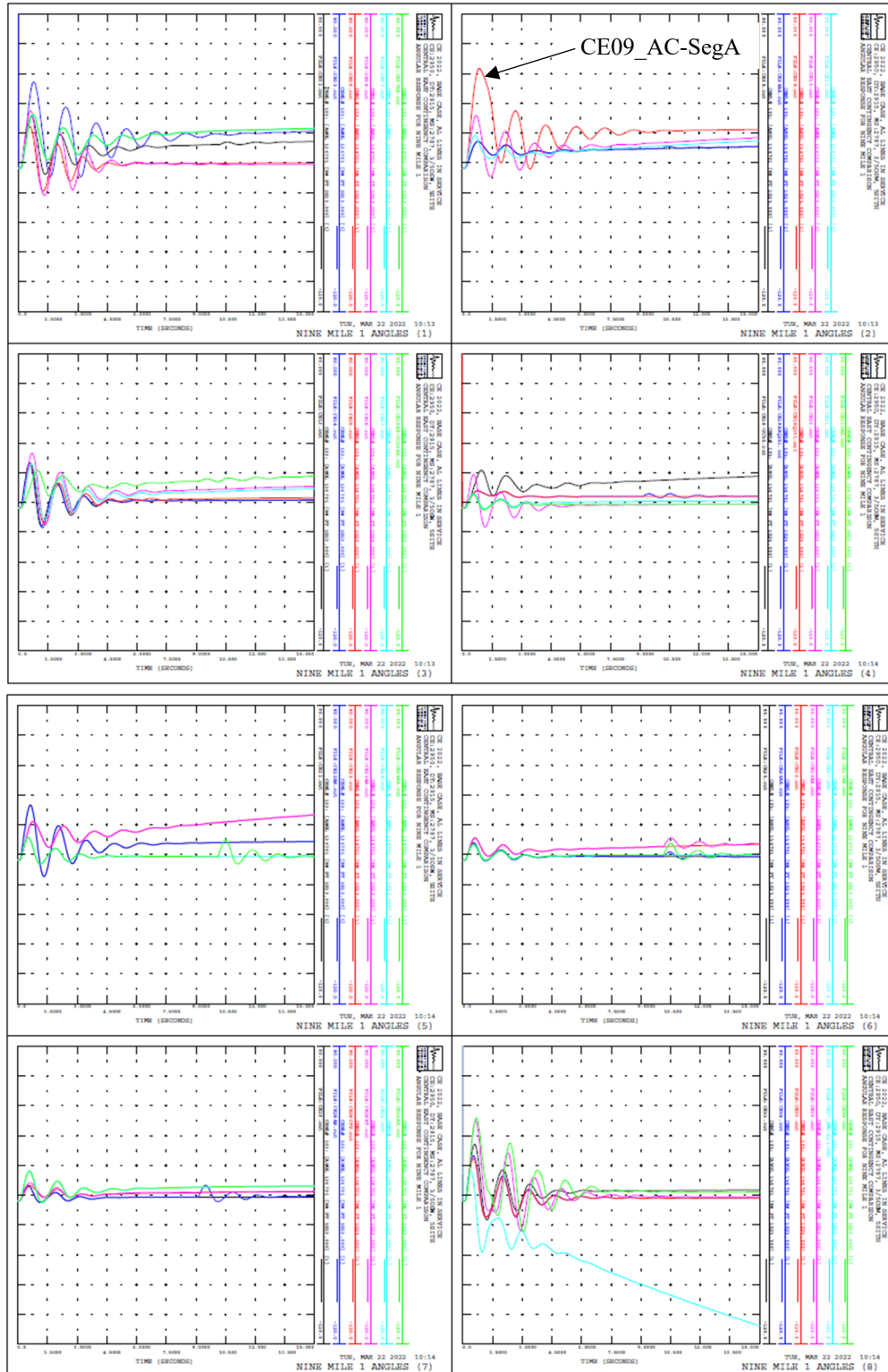
Central East Stability Limit with All Lines In-Service

All Lines In-Service Stability Limit Results

Stability limit results for all lines in-service cases are found in Table 6 below:

Oswego	Stlbe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
5	5	3100	2750	-350	3000	2700	-300	2950	2700	-250	3100	2800	-300	3100	2800	-300	3100	2800	-300
	3	3050	2700	-350	2950	2650	-300	2850	2650	-200	3050	2750	-300	3050	2700	-350	3050	2700	-350
	0	2900	2550	-350	2850	2550	-300	2850	2550	-300	2900	2650	-250	2900	2600	-300	2900	2600	-300
4	5	3050	2650	-400	2950	2650	-300	2950	2650	-300	3100	2700	-400	3100	2700	-400	3100	2700	-400
	3	3050	2600	-450	2950	2600	-350	2900	2600	-300	3050	2650	-400	3050	2650	-400	3050	2650	-400
	0	2850	2450	-400	2800	2400	-400	2700	2400	-300	2850	2550	-300	2850	2500	-350	2850	2500	-350
3	5	3050	2600	-450	2950	2550	-400	2950	2550	-400	3050	2650	-400	3050	2600	-450	3050	2600	-450
	3	3000	2550	-450	2950	2500	-450	2900	2500	-400	3050	2600	-450	3050	2600	-450	3050	2600	-450
	0	2800	2350	-450	2700	2250	-450	2700	2200	-500	2900	2500	-400	2900	2450	-450	2900	2450	-450
2	5	3000	2500	-500	2900	2450	-450	2850	2450	-400	3050	2600	-450	3050	2550	-500	3050	2550	-500
	3	2900	2400	-500	2850	2350	-500	2800	2350	-450	2950	2500	-450	2950	2500	-450	2950	2500	-450
	0	2750	2200	-550	2700	2150	-550	2650	2150	-500	2800	2350	-450	2800	2300	-500	2800	2300	-500
1	5	2650	2400	-250	2650	2350	-300	2650	2350	-300	2900	2500	-400	2900	2500	-400	2900	2500	-400
	3	2450	2250	-200	2450	2200	-250	2450	2200	-250	2750	2350	-400	2750	2350	-400	2750	2350	-400
	1	2400	2000	-400	2400	2000	-400	2400	1950	-450	2550	2150	-400	2550	2100	-450	2550	2100	-450
0	5	2200	2000	-200	2200	2000	-200	2200	2000	-200	2400	2200	-200	2400	2150	-250	2400	2150	-250
	3	2000	1850	-150	2000	1850	-150	2000	1850	-150	2200	2000	-200	2200	2000	-200	2200	2000	-200
	0	1750	1600	-150	1750	1600	-150	1750	1600	-150	1900	1800	-100	1950	1750	-200	1950	1750	-200

Table 6: Updates to Existing All Lines In-Service Stability Limits



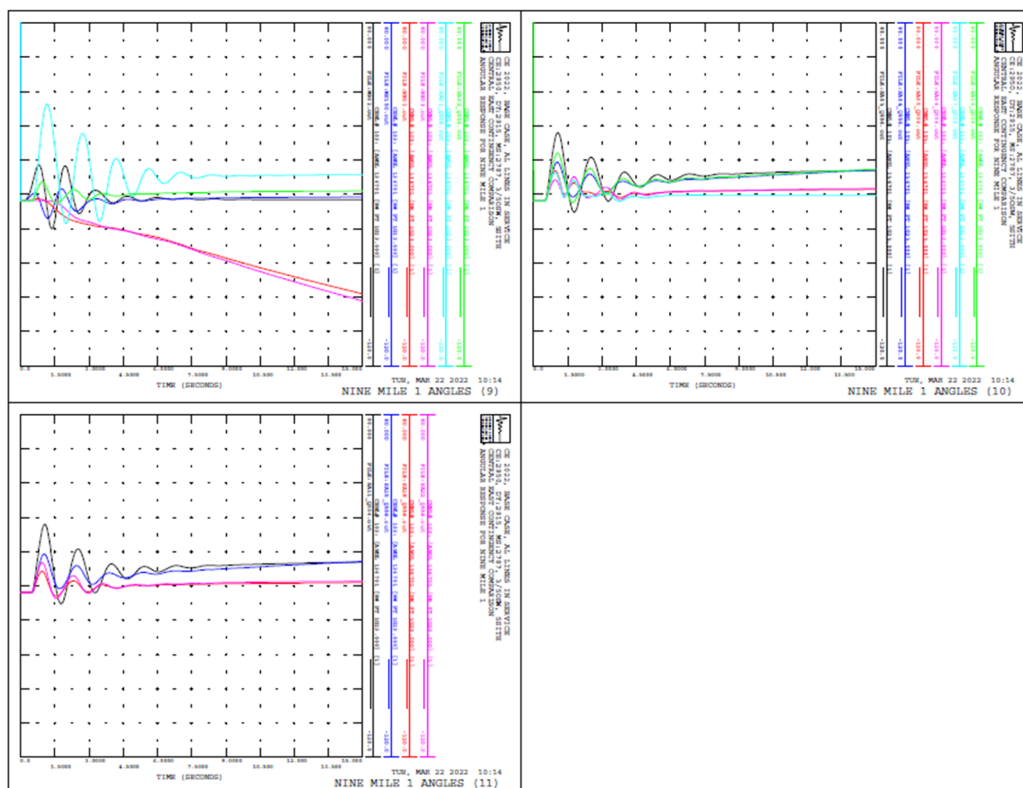


Figure 2: Nine Nile 1 Angles in Case 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service Contingency Responses

The left graph in Figure 3 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE09_AC-SegA on the NYCA. The right graph in Figure 3 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE09_AC-SegA.

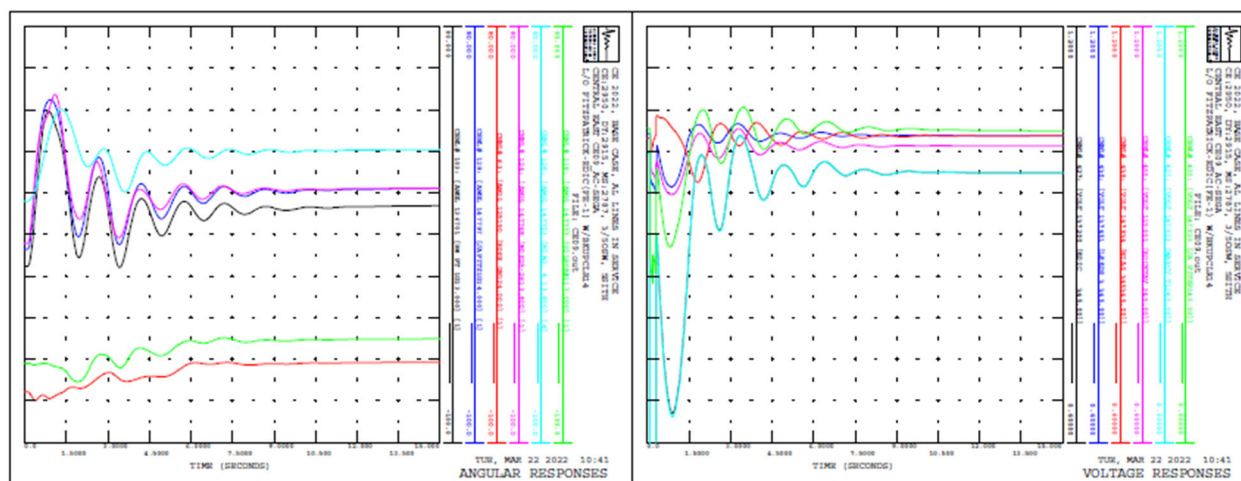


Figure 3: Case 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE09_AC-SegA Angle/Voltage Plots

Central East Stability Limit with Line Outages

Massena – Marcy (MSU1) 765 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Massena – Marcy (MSU1) 765 kV cases are found in Table 7 below:

Massena - Marcy (MSU1) 765 kV Out-of-Service																			
Oswego	Stlbe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2650	2100	-550	2650	2050	-600	2650	2050	-600	2650	2150	-500	2650	2150	-500	2650	2150	-500
	3	2500	2000	-500	2500	2000	-500	2500	2000	-500	2500	2050	-450	2500	2050	-450	2500	2000	-500
	0	2200	1850	-350	2200	1850	-350	2200	1850	-350	2200	1850	-350	2200	1850	-350	2200	1850	-350
2	5	2300	1950	-350	2300	1950	-350	2300	1950	-350	2300	1950	-350	2300	1950	-350	2300	1950	-350
	3	2100	1850	-250	2100	1850	-250	2100	1800	-300	2100	1850	-250	2100	1850	-250	2100	1850	-250
	0	1850	1650	-200	1850	1650	-200	1850	1650	-200	1850	1650	-200	1850	1650	-200	1850	1650	-200

Table 7: Updates to Massena – Marcy (MSU1) 765 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Massena – Marcy (MSU1) 765 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 7 Updates to Massena – Marcy (MSU1) 765 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE99, a single line to ground fault at Scriba 345 kV which results in the loss of Scriba – Volney (21) 345kV and the back-up clearing of the Fitzpatrick – Scriba (FS-10) 345 kV line.

The left graph in Figure 4 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE99 on the NYCA. The right graph in Figure 4 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE99.

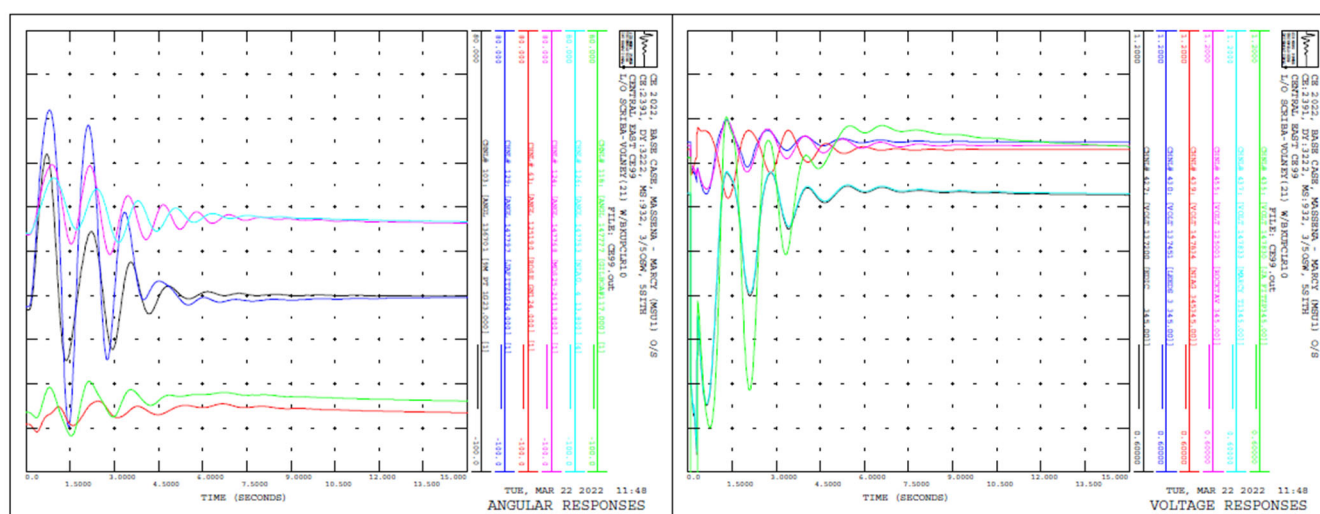


Figure 4: Case MSU1 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE99 Angle/Voltage Plot

Oakdale – Fraser (32) 345 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Oakdale – Fraser (32) 345 kV cases are found in Table 8 below:

Oakdale - Fraser (32) 345 kV Out-of-Service																			
Oswego	Sithe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	3000	2550	-450	2900	2550	-350	2850	2550	-300	3000	2650	-350	3000	2600	-400	2950	2600	-350
	3	2950	2450	-500	2900	2450	-450	2850	2400	-450	3000	2600	-400	3000	2550	-450	2950	2550	-400
	0	2750	2200	-550	2750	2200	-550	2650	2150	-500	2850	2400	-450	2850	2350	-500	2800	2300	-500
2	5	3000	2500	-500	2850	2450	-400	2800	2450	-350	3050	2600	-450	3000	2550	-450	3000	2550	-450
	3	2900	2400	-500	2800	2400	-400	2750	2400	-350	2950	2500	-450	2950	2500	-450	2950	2500	-450
	0	2750	2150	-600	2650	2100	-550	2600	2100	-500	2800	2350	-450	2800	2300	-500	2800	2300	-500

Table 8: Updates to Oakdale – Fraser (32) 345 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Oakdale – Fraser (32) 345 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 8 Updates to Oakdale – Fraser (32) 345 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE09_AC-SegA, a single line to ground fault at Edic 345 kV which results in the loss of Fitzpatrick – Edic (FE-1) 345kV and the back-up clearing of the Edic – Gordon Road (14) 345 kV line.

The left graph in Figure 5 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE09_AC-SegA on the NYCA. The right graph in Figure 5 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE09_AC-SegA.

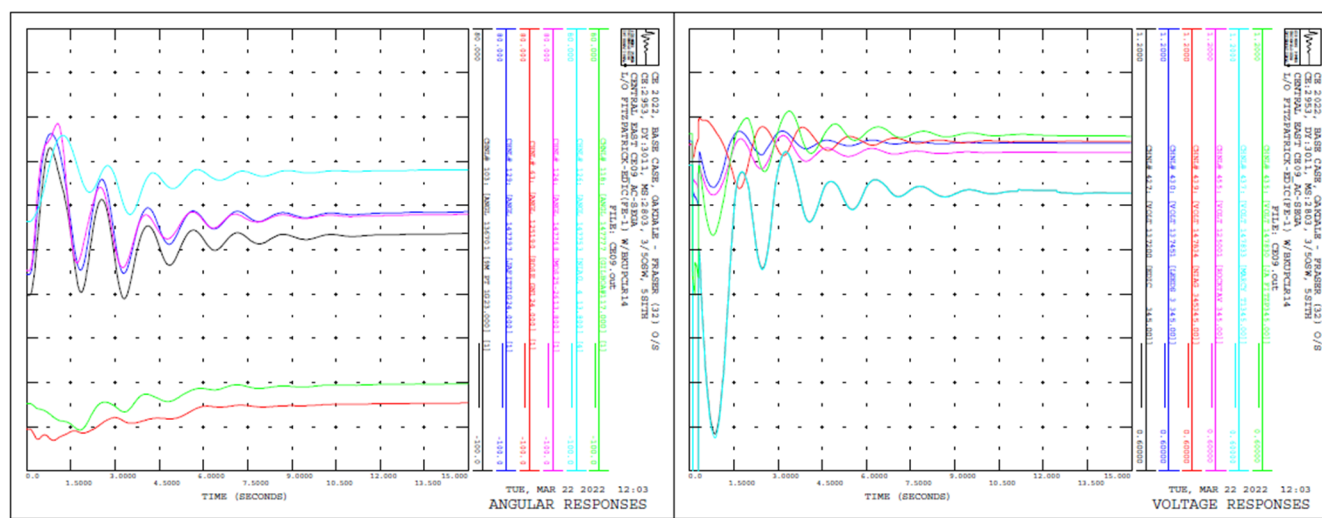


Figure 5: Case 32 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE09_AC-SegA Angle/Voltage Plot

Clarks Corners - Oakdale (36) 345 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Clarks Corners - Oakdale (36) 345 kV cases are found in Table 9 below:

Clarks Corners - Oakdale (36) 345 kV Out-of-Service																			
Oswego	Site	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2850	2550	-300	2750	2500	-250	2700	2500	-200	2850	2600	-250	2850	2600	-250	2800	2600	-200
	3	2800	2450	-350	2750	2450	-300	2700	2450	-250	2850	2550	-300	2850	2500	-350	2800	2500	-300
	0	2600	2200	-400	2600	2200	-400	2500	2150	-350	2700	2400	-300	2700	2300	-400	2650	2300	-350
2	5	2850	2450	-400	2700	2450	-250	2650	2450	-200	2900	2550	-350	2850	2550	-300	2850	2550	-300
	3	2750	2300	-450	2650	2300	-350	2600	2300	-300	2800	2450	-350	2800	2400	-400	2800	2400	-400
	0	2600	2050	-550	2500	2050	-450	2450	2050	-400	2650	2200	-450	2650	2150	-500	2650	2150	-500

Table 9: Updates to Clarks Corner – Oakdale (36) 345 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Clarks Corners – Oakdale (36) 345 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 9 Updates to Clarks Corners – Oakdale (36) 345 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE09_AC-SegA, a single line to ground fault at Edic 345 kV which results in the loss of Fitzpatrick – Edic (FE-1) 345kV and the back-up clearing of the Edic – Gordon Road (14) 345 kV line.

The left graph in Figure 6 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE09_AC-SegA on the NYCA. The right graph in Figure 6 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE09_AC-SegA.

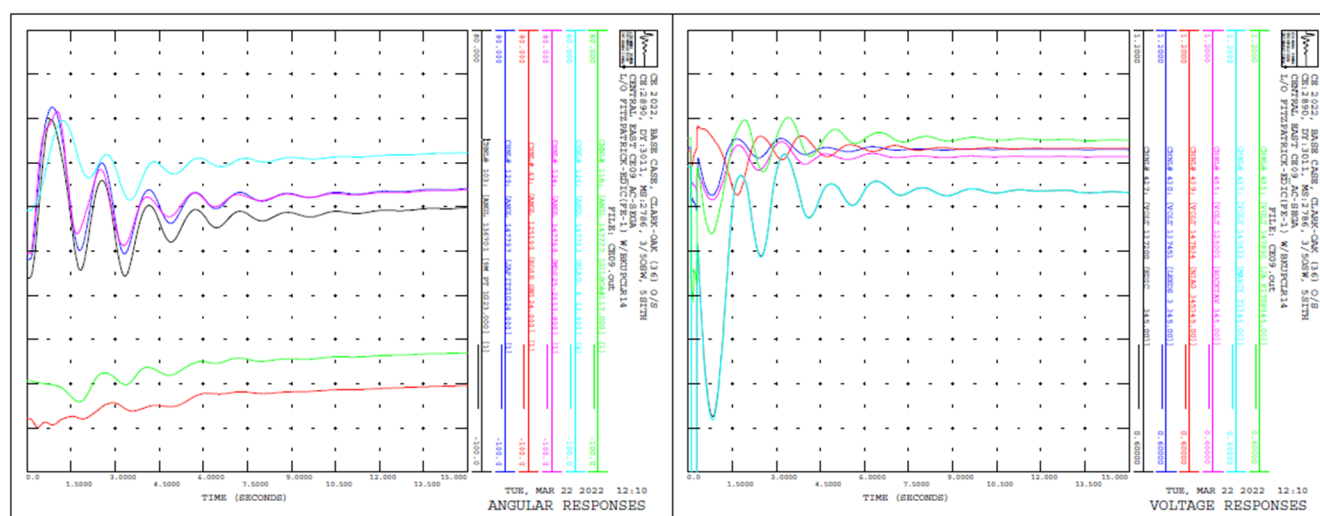


Figure 6: Case 36 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE99 Angle/Voltage Plot

Lafayette - Clarks Corners (4-46) 345 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Lafayette - Clarks Corners (4-46) 345 kV cases are found in Table 10 below:

Lafayette - Clarks Corners (4-46) 345 kV Out-of-Service																			
Oswego	Site	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2850	2500	-350	2750	2450	-300	2700	2450	-250	2850	2600	-250	2850	2600	-250	2800	2600	-200
	3	2800	2400	-400	2750	2400	-350	2700	2350	-350	2850	2500	-350	2850	2500	-350	2800	2500	-300
	0	2600	2150	-450	2600	2150	-450	2500	2150	-350	2700	2350	-350	2700	2350	-350	2650	2300	-350
2	5	2850	2450	-400	2700	2400	-300	2650	2400	-250	2900	2550	-350	2850	2500	-350	2850	2500	-350
	3	2750	2300	-450	2650	2300	-350	2600	2250	-350	2800	2400	-400	2800	2400	-400	2800	2400	-400
	0	2600	2050	-550	2500	2050	-450	2450	2000	-450	2650	2200	-450	2650	2150	-500	2650	2150	-500

Table 10: Updates to Lafayette - Clarks Corners (4-46) 345 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Lafayette - Clarks Corners (4-46) 345 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 10 Updates to Lafayette - Clarks Corners (4-46) 345 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE09_AC-SegA, a single line to ground fault at Edic 345 kV which results in the loss of Fitzpatrick – Edic (FE-1) 345kV and the back-up clearing of the Edic – Gordon Road (14) 345 kV line.

The left graph in Figure 7 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE09_AC-SegA on the NYCA. The right graph in Figure 7 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE09_AC-SegA.

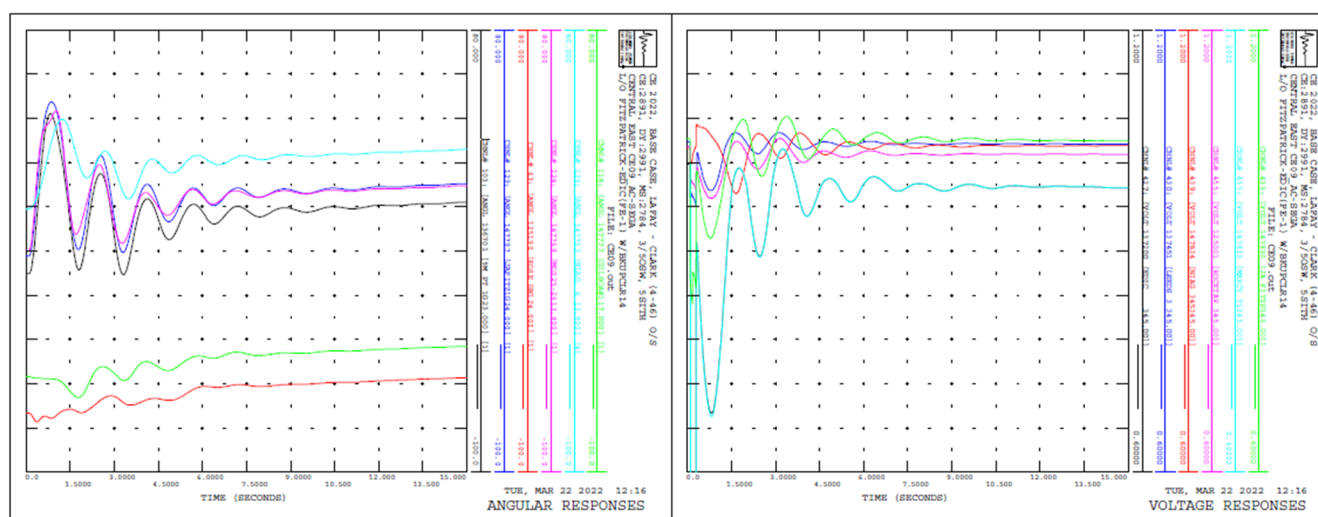


Figure 7: Case 4-46 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE09_AC-SegA Angle/Voltage Plot

Marcy - New Scotland (18) 345 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Marcy - New Scotland (18) 345 kV cases are found in Table 11 below:

Marcy - New Scotland (18) 345 kV Out-of-Service																			
Oswego	Sithe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2050	1650	-400	1700	1650	-50	1700	1650	-50	2050	1700	-350	1700	1700	0	1700	1700	0
	3	N/A	1650		N/A	1650		N/A	1650		N/A	1650		N/A	1650		N/A	1650	
	0	N/A	1600		N/A	1550		N/A	1550		N/A	1600		N/A	1600		N/A	1600	
2	5	2050	1650	-400	1700	1650	-50	1700	1650	-50	2050	1700	-350	1700	1650	-50	1700	1650	-50
	3	N/A	1600		N/A	1600		N/A	1600		N/A	1650		N/A	1650		N/A	1650	
	0	N/A	1600		N/A	1600		N/A	1600		N/A	1600		N/A	1600		N/A	1600	

Table 11: Updates to Marcy - New Scotland (18) 345 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Marcy - New Scotland (18) 345 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 11 Updates to Marcy - New Scotland (18) 345 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE09_AC-SegA, a single line to ground fault at Edic 345 kV which results in the loss of Fitzpatrick – Edic (FE-1) 345kV and the back-up clearing of the Edic – Gordon Road (14) 345 kV line.

The left graph in Figure 8 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE09_AC-SegA on the NYCA. The right graph in Figure 8 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE09_AC-SegA.

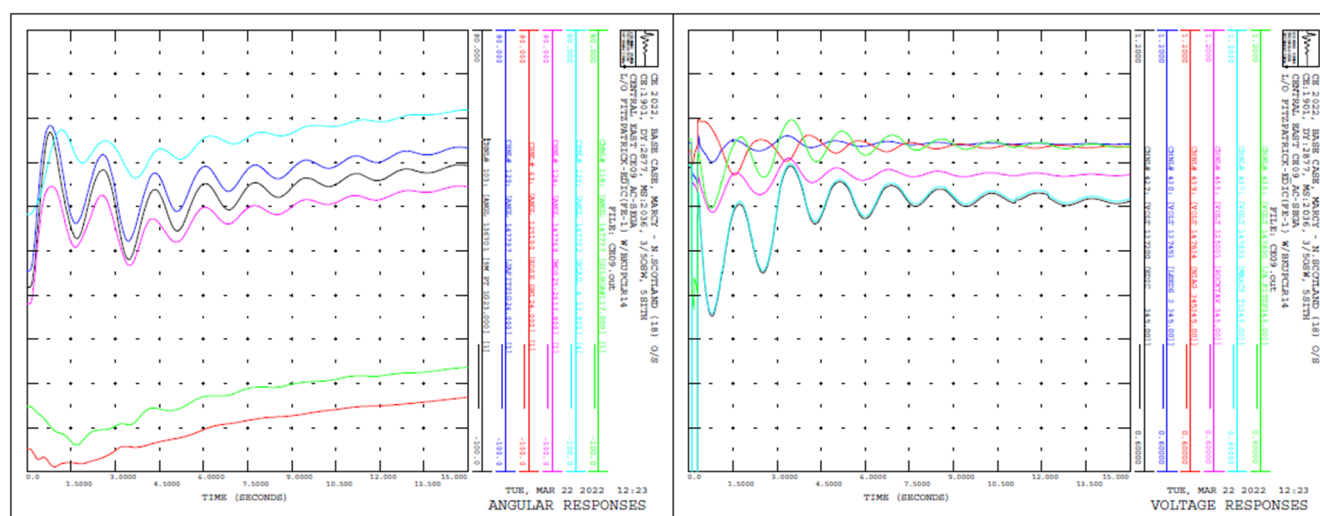


Figure 8: Case 18 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE09_AC-SegA Angle/Voltage Plot

Edic - Gordon Rd (14) 345 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Edic - Gordon Rd (14) 345 kV cases are found in Table 12 below:

Edic - Gordon Rd (14) 345 kV Out-of-Service																			
Oswego	Sithe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	2050	1800	-250	1700	1800	100	1700	1800	100	2050	1850	-200	1700	1850	150	1700	1850	150
	3	N/A	1750		N/A	1750		N/A	1750		N/A	1800		N/A	1800		N/A	1800	
	0	N/A	1500		N/A	1400		N/A	1400		N/A	1700		N/A	1650		N/A	1650	
2	5	2050	1750	-300	1700	1750	50	1700	1750	50	2050	1800	-250	1700	1800	100	1700	1800	100
	3	N/A	1700		N/A	1650		N/A	1650		N/A	1750		N/A	1750		N/A	1750	
	0	N/A	1500		N/A	1400		N/A	1400		N/A	1700		N/A	1650		N/A	1650	

Table 12: Updates to Edic - Gordon Rd (14) 345 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Edic - Gordon Rd (14) 345 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 12 Updates to Edic - Gordon Rd (14) 345 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE99, a single line to ground fault at Scriba 345 kV which results in the loss of Scriba – Volney (21) 345kV and the back-up clearing of the Fitzpatrick – Scriba (FS-10) 345 kV line.

The left graph in Figure 9 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE99 on the NYCA. The right graph in Figure 9 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE99.

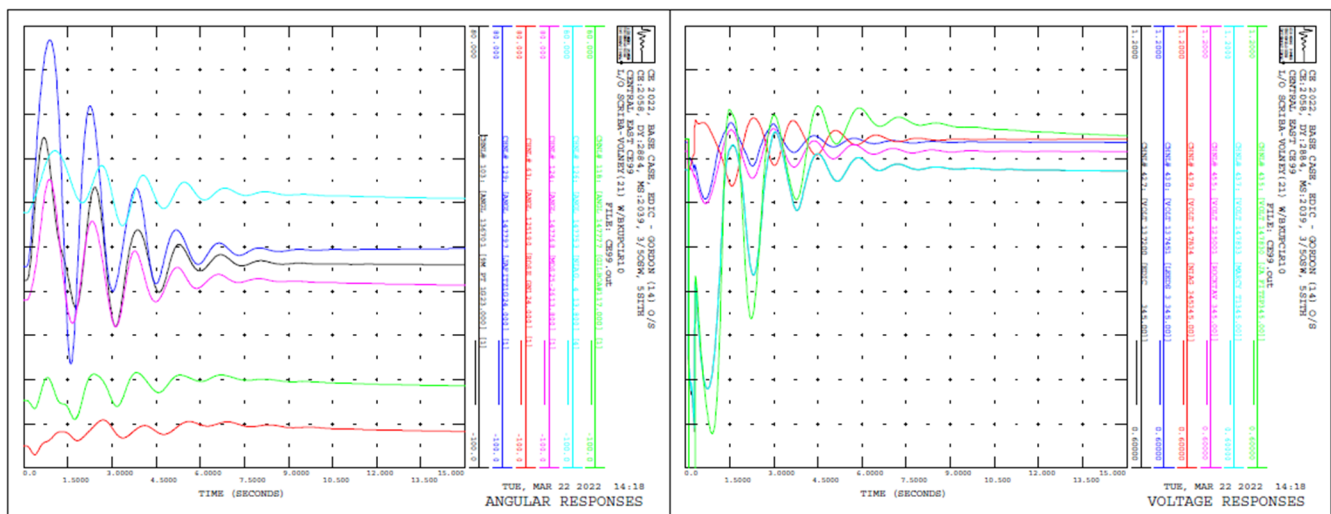


Figure 9: Case 14 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE99 Angle/Voltage Plot

Gordon Rd - New Scotland (55) 345 kV Out-of-Service Stability Limit Results

Stability limit results for the outage of Gordon Rd - New Scotland (55) 345 kV cases are found in Table 12 below:

Gordon Rd - New Scotland (55) 345 kV Out-of-Service																			
Oswego	Sithe	Marcy StatCom O/S									Marcy StatCom I/S								
		SVCs I/S			One SVC O/S			Both SVCs O/S			SVCs I/S			One SVC O/S			Both SVCs O/S		
		Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta	Current	Tested	Delta
3	5	N/A	2400		N/A	2350		N/A	2350		N/A	2450		N/A	2450		N/A	2450	
	3	N/A	2250		N/A	2200		N/A	2200		N/A	2400		N/A	2400		N/A	2400	
	0	N/A	2000		N/A	2000		N/A	1950		N/A	2200		N/A	2150		N/A	2150	
2	5	N/A	2400		N/A	2350		N/A	2350		N/A	2400		N/A	2400		N/A	2400	
	3	N/A	2200		N/A	2150		N/A	2150		N/A	2350		N/A	2350		N/A	2350	
	0	N/A	1850		N/A	1850		N/A	1800		N/A	2150		N/A	2100		N/A	2100	

Table 13: Updates to Gordon Rd - New Scotland (55) 345 kV outage Stability Limits

All Central East contingencies listed on Table 5 Contingencies Applied for Evaluating Central East Stability Transfer Limits were tested for the 3 Oswego scenario with 5 Sithe, Marcy StatCom and both SVCs in-service with Gordon Rd - New Scotland (55) 345 kV line out-of-service. The contingencies that resulted in the largest oscillation of machine angles or caused instability were employed to determine all the proposed limits presented on Table 13 Updates to Gordon Rd - New Scotland (55) 345 kV outage Stability Limits.

The most severe contingency related to Central East stability is CE09_AC-SegA, a single line to ground fault at Edic 345 kV which results in the loss of Fitzpatrick – Edic (FE-1) 345kV and the back-up clearing of the Edic – Gordon Road (14) 345 kV line.

The left graph in Figure 10 below shows six angle responses: Fitzpatrick, Nine Mile 1, Moses and Gilboa to show the impact on major generators near the Central East, along with Niagara and Roseton to show the broader impact of CE09_AC-SegA on the NYCA. The right graph in Figure 10 also shows the voltage response at major buses near the Central East, Marcy 345 kV, Edic 345 kV, Fitzpatrick 345 kV and Leeds 345 kV, as well as Niagara 345 kV and Rock Tavern 345 kV to show the broader impact of CE09_AC-SegA.

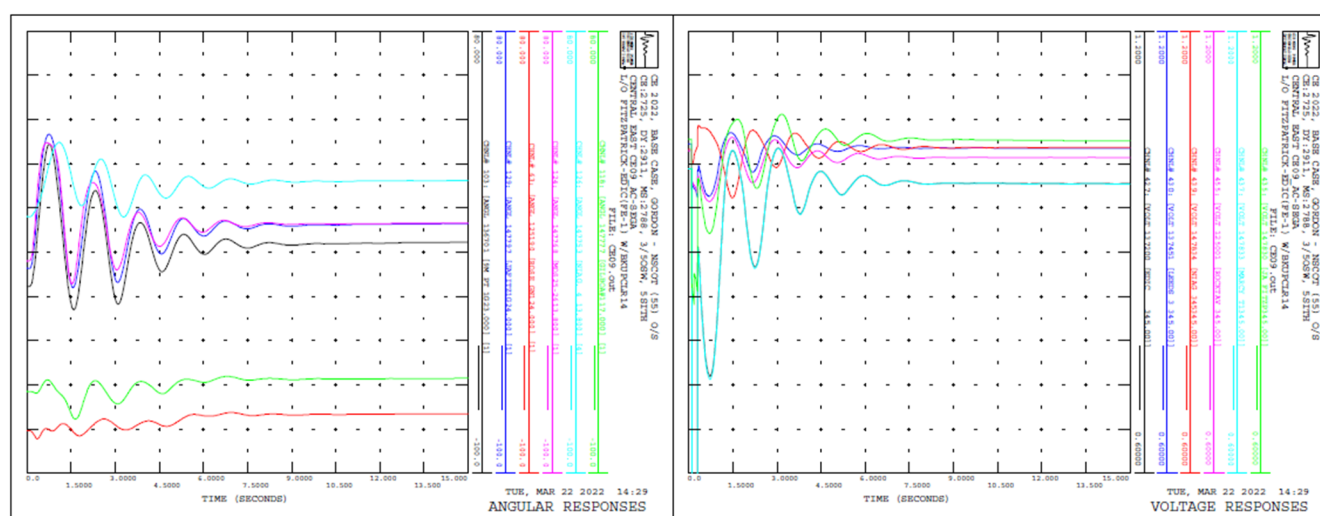


Figure 10: Case 55 OS, 3 Oswego, 5 Sithe, Marcy StatCom and SVCs In-Service with Contingency CE09_AC-SegA Angle/Voltage Plot