5.3. Tested Contingencies

Table 9 Tested Stability Contingencies

Contingencies – Single fault events	
CE01	3PH-NC@EDIC345 – L/O EDIC-NEW SCOTLAND #14 W/RCL
CE02	3PH-NC@MARCY345 – L/O MARCY-N.SCOTLAND (UNS-18) W/RCL
CE03	SLG-STK@EDIC345 (BKR R935) – L/O EDIC-N.SCOT #14 / BKUP CLR FE1
CE05	3PH-NC@EDIC345 – L/O EDIC-MARCY UE1-7
CE06	3PH-NC@MARCY345 – L/O EDIC-MARCY (UE1-7)
CE07Q380	LLG@MARCY/EDIC - L/O MARCY-COOPERS (UCC2-41) & EDIC-FRASER (EF24-40) DCT
CE08Q380	LLG@COOPERS - L/O MARCY-COOPERS (UCC2-41)/FRASER-COOPERS (FCC33) DCT
CE09	SLG-STK@EDIC345KV – L/O FITZ-EDIC #FE-1/BKUP CLR#14
CE10	SLG-STK@MARCY345 (BKR3308) – L/O MARCY-N.SCOT (UNS-18)
CE11	SLG-STK@FRASER345 (BKR B1/3562) – L/O FRASER-GILBOA (GF-5)
CE12	3PH-NC@NSCOT345 – L/O EDIC-N.SCOT #14 W/H.S RCL
CE13	3PH-NC@VOLNEY345 – L/O VOLNEY-MARCY (VU-19)
CE14	3PH-NC@MARCY345 – L/O VOLNEY-MARCY (VU-19)
CE15	SLG-STK@MARCY345(BKR 3108) – L/O VOLNEY-MARCY (VU-19) / BKUP CLR#UE1-7
CE16Q380*	SLG-STK@EDIC345 (BKR R915) – L/O EDIC-FRASER (EF24-40) / BKUP CLR#2-15
CE17Q380	SLG-STK@MARCY(BKR 3208)- L/O MARCY-COOPERS(UCC2-41)
CE18Q368**	LLG@ROCK – L/O COOPERS CORNERS-ROCK TAVERN DCT
CE19Q368	LLG@COOPERS – L/O COOPERS CORNERS-ROCK TAVERN DCT
CE20	SLG-STK@EDIC345 (BKR R70) – L/O EDIC-MARCY UE1-7/ BKUP CLR EDIC T2 & T4
CE21Q380	SLG-STK@FRASER – L/O FRASER-COOPERS 33 / BKUP CLR#32@OAKDALE
CE22Q380	3PH-NC@EDIC345 – L/O EDIC-FRASER EF-24/40
CE23Q380	LLG@FRASER – L/O MARCY-COOPERS(UCC2-41)/EDIC-FRASER(EF24-40) DCT
CE24Q380	3PH-NC@FRASER – L/O FRASER-COOPERS CORNERS FCC-33
CE25Q380	3PH-NC@COOPERS – L/O FRASER-COOPERS CORNERS FCC-33
CE26Q380	3PH-NC@COOPERS – L/O MARCY-COOPERS CORNERS UCC-2/41
CE27	3PH-NC@COOPERS – L/O COOPERS CORNERS-ROCK TAVERN CCRT-34
CE27AR	3PH-NC@COOPERS – L/O COOPERS CORNERS-ROCK TAVERN CCRT-34 W/RCL
CE28	3PH-NC@COOPERS – L/O COOPERS CORNERS-ROCK TAVERN CCRT-42
CE28AR	3PH-NC@COOPERS – L/O COOPERS CORNERS-ROCK TAVERN CCRT-42 W/RCL
CE32Q380	3PH-NC@FRASER – L/O EDIC - FRASER EF-24/40
CE33	3PH-NC@FITZ – L/O EDIC - FITZPATRICK FE-1
CE99	SLG-STK@SCRIBA345 (BKR R935) – L/O SCRIBA-VOLNEY 21 / BKUP CLR FITZ-SCRIBA #10
MS02	3PH-NC@MOSES230 – L/O MOSES-ADIR W/NO REJ.
MS150	LLG@MOSES230 – L/O MOSES-ST.LAWRENCE L33/34P DCT W/NO REJ
NE01	3PH-NC@SEABROOK345 – L/O SEABROOK G1
NE03	L/O PHASE II INTERCONNECTION W/O FAULT (N-1)

5.4. Monitored Parameters

Reporting for this report focuses on the post contingency voltage response at Edic 345 kV and the reactive responses of the dynamic voltage response resources in central New York.

5.5. Limit Development Process

The stability transfer limits indicated in this study were developed in accordance with the NYISO Transmission Expansion and Interconnection Manual Attachment H, NYISO Transmission Planning Guideline #3-1, Section 2 excerpted below:

2 TRANSFER LEVEL

The determination of interface transfer limits requires the consideration of thermal, voltage and stability limitations. When determining a stability limit, a margin also shall be applied to the power transfer level to allow for uncertainties associated with system modeling. This margin shall be the largest of ten percent of the highest stable transfer level simulated or 200 MW. The margin also shall be applied in establishing a stability limit for faults remote from the interface for which the power transfer limit is being determined.

To confirm that power transfer levels will not be restricted by a stability constraint, the stability simulation shall be initially conducted at a value of at least ten percent above the controlling thermal or voltage-based transfer limit. The voltage-based transfer limit ("voltage transfer limit") shall be determined in accordance with NYISO Transmission Planning Guideline #2, "Guideline for Voltage Analysis and Determination of Voltage-Based Transfer Limits." If a converged powerflow cannot be achieved at this higher transfer level, then the stability simulation shall be conducted at the highest achievable transfer level above the voltage transfer limit. If the stability simulation at that level is deemed to be stable, then voltage control facilities in the form of capacitive compensation shall be artificially added to the powerflow case to achieve a convergence at a transfer level equal to the voltage transfer limit divided by 0.90. This procedure ensures that the application of the margin does not result in the determination of a "stability limit" that is lower than the voltage transfer limit when the restriction is actually due to voltage. The amount and location of any such artificially added capacitive compensation shall be reported in the study results.

Stability limits shall be determined for interfaces on an independent basis. In doing so, it is recognized that interfaces for which the stability limit is not being determined may exceed their thermal, voltage or stability transfer capabilities.

To assess the stability performance of the bulk power system, system stability and generator unit stability shall be considered.

2.1 System Stability

Overall power system stability is that property of a power system which ensures that it will remain in operating equilibrium through normal and abnormal conditions. The bulk power system shall be deemed unstable if, following a disturbance, the stability analysis indicates increasing angular displacement between various groups of machines characterizing system separation. Further, a power system exhibits "oscillatory instability" (sustained or cumulative oscillations) for a particular steady-state operating condition if, following a disturbance, its instability is caused by insufficient damping torque.

For a stability simulation to be deemed stable, oscillations in angle and voltage must exhibit positive damping within ten seconds after initiation of the disturbance. If a secondary mode of oscillation exists within the initial ten seconds, then the simulation time shall be increased sufficiently to demonstrate that successive modes of oscillation exhibit positive damping before the simulation may be deemed stable.

2.2 Generator Unit Stability

A generator is in synchronous operation with the network to which it is connected if its average electrical speed (the product of its rotor angular velocity and the number of pole pairs) is equal to the angular frequency of the alternating current network voltage.

For those cases where the stability simulation indicates generator unit instability, the NYISO shall determine whether a power transfer limit shall be invoked or whether the unit instability shall be considered to be acceptable. To determine whether the generator unit instability may be deemed acceptable, the stability simulation shall be re-run with either the generator unit in question tripped due to relay action or modeled unstable to assess such impact on overall bulk power system performance. The result of this latter simulation shall determine whether a stability-based transfer limit shall be applied at the simulated power transfer level.

5.6. Transfer Limit Testing

The Central East stability limits are tested within each individual section:

- both Leeds and Fraser SVCs in-service,
- one of either Leeds or Fraser SVC in-service, and
- both Leeds and Fraser SVCs out–of-service.