#U3-026– Collins 765kV
Generation Interconnection

Network Impacts

The queue U3-026 project was studied as a 1500MW (492MW Capacity) injection into ComEd's system at the Collins 765kV substation. Project U3-026 was evaluated for compliance with reliability criteria for summer peak conditions in 2013.

IN THE "DELIVERY OF ENERGY PORTION OF INTERCONNECTION REQUEST" SECTION OF THIS REPORT, THERE ARE SEVERAL SITUATIONS THAT WILL LIKELY CAUSE CURTAILMENT OF THIS PROJECT. SOME SITUATIONS MAY LIMIT THE AGGREGATE TOTAL OF THE ENERGY OUTPUT OF THIS PROJECT AND ADJACENT GENERATING FACILITIES WELL BELOW THEIR FULL ENERGY OUTPUT ON A FREQUENT, IF NOT CONTINUOUS, BASIS. FACTORS THAT CAN AFFECT THE AMOUNT OF CURTAILMENT ARE SEASONAL VARIATIONS IN LINE RATINGS, ACTUAL LOAD FLOWS, AND ACTUAL DISPATCH OF OTHER LOCAL GENERATION. UNDER LIGHT LOAD CONDITIONS FOR WIND FARMS, CURTAILMENT MAY BE EVEN MORE SEVERE. PLEASE NOTE THAT ANY REQUIRED UPGRADES LISTED BELOW WILL NOT ELIMINATE THIS CONGESTION. SEE THE "DELIVERY OF ENERGY PORTION OF INTERCONNECTION REQUEST" SECTION AT THE END OF THE REPORT FOR FURTHER DETAILS.

Potential network impacts were as follows:

Generator Deliverability
(Single or N-1 contingencies for the Capacity portion only of the interconnection)

No problems were identified.

Multiple Facility Contingency
(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the Impact Study.)

No problems were identified.

Short Circuit
(Summary of impacted circuit breakers)

To be determined in the System Impact Study.

Contribution to Previously Identified Overloads

(U3-026 contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

Table 1 - Contribution to Previously Identified Overloads								
Item	Project	Contribution MW	Overloaded Element	Overload %		Rating		Contingency
				From	To	Type	MVA	
1a	U3-026	100.57	Collins 765/345kV transformer 92	102.9%	110.2%	Emergency	1380	Collins to Plano 765kV line 2315 ('765-L2315___-S')
1b	U3-026	38.63	Plano to Electric Junction 345kV Red line 16703	131.9%	134.8%	Emergency	1341	Plano to Electric Junction Blue 345kV line 16704 ('345-L16704_B-S')
1c	U3-026	34.62	Plano to Electric Junction Blue 345kV line 16704	114.0%	116.6%	Emergency	1341	Plano to Electric Junction 345kV Red line 16703 ('345-L16703_R-S')
1d	U3-026	44.7	Plano 345/138kV transformer	124.1%	125.2%	Applicable Load Dump Rating	610	Tower outage of Plano to Electric Junction 345kV Red line 16703 and Plano to Electric Junction Blue 345kV line 16704 ('345-L16703_R-S_+_345-L16704_B-S')

Steady-State Voltage Requirements

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

To be determined in the System Impact Study.

Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

To be determined in the System Impact Study.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

None.

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)

Projects prior to U3-026 in the PJM Queue demonstrated the need to extend a 765 kV line from Collins easterly to a tie with the AEP system. It is expected that the 765 kV "backbone" will also address the overloads identified in Table 1 (See "Contribution to Previously Identified Overloads" section). This project may have cost allocation for the following previously identified system reinforcements:

- Expansion of the 765 kV bus at Collins to accommodate an additional circuit
- Construction of a new 765 kV circuit from Collins east to a location in AEP
- Relocation of existing 765kV line 11216

Additional studies will be performed during the System Impact and Facilities Studies to determine the optimum plan to address these issues. Studies will also be performed regarding cost allocation among the various projects.

Potential Issues

In the previous queue, multiple projects were studied with more than one option. The U queue was studied with the primary Point of Interconnection (POI) from the prior queue. U queue primary POI selections were studied with only other U queue primary POI selections and the prior queue constraints listed above. U queue secondary POI selections were studied with only other U queue secondary POI selections and the prior queue constraints listed above. Depending on which POI selection the prior queue projects choose, results may significantly change between the Feasibility and Impact Studies.

Additional impacts that require upgrades may be found for this project during the Impact Study analysis.

Impacts on the MISO member transmission systems are not included in this analysis, but they will be included in the Impact Study, which may reveal upgrades needed in the MISO system not identified in this Feasibility Study.

Delivery of Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The interconnection customer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

As a result of the aggregate energy resources in the area, the following violations were identified:

Table 2 - Delivery of Energy Portion of Interconnection Request								
Item	Project	Contribution MW	Overloaded Element	Overload %		Rating		Contingency
				From	To	Type	MVA	
2a	U3-026	603.1	Collins 765/345kV transformer 92	300.8%	344.5%	Emergency	1380	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2b	U3-026	449.9	Plano 765/345kV transformer 93	237.0%	269.6%	Emergency	1380	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2c	U3-026	447.1	Plano 765/345kV transformer 94	225.9%	258.3%	Emergency	1380	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2d	U3-026	1193.4	Collins to Wilton Center 765kV line11216	177.7%	204.5%	Emergency	4460	Collins to Plano 765kV line 2315 ('765-L2315___-S')
2e	U3-026	378.8	Collins Red to Dresden Blue 345kV line 2311	173.2%	203.0%	Emergency	1341	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2f	U3-026	218.2	Wilton Center to Blue Island Red 345kV line 11614	162.4%	177.5%	Emergency	1441	Wilton Center to Dumont 765kV line 11215 ('05DUMONT 765 - WILTO; 765 - 1')
2g	U3-026	219.2	Kendall to Lockport Red 345kV line 10806	154.5%	177.5%	Emergency	1528	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2h	U3-026	194.9	Wilton Center to Blue Island Blue 345kV line 11613	149.9%	163.4%	Emergency	1441	Wilton Center to Dumont 765kV line 11215 ('05DUMONT 765 - WILTO; 765 - 1')
2i	U3-026	896.9	Collins to Plano 765kV line 2315	143.3%	163.4%	Emergency	4460	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2j	U3-026	291.1	Wilton Center 765/345kV transformer 93	136.7%	157.8%	Emergency	1380	Wilton Center to Dumont 765kV line 11215 ('05DUMONT 765 - WILTO; 765 - 1')
2k	U3-026	290.9	Wilton Center 765/345kV transformer 94	136.7%	157.8%	Emergency	1380	Wilton Center to Dumont 765kV line 11215 ('05DUMONT 765 - WILTO; 765 - 1')
2l	U3-026	117.8	Plano to Electric Junction Red 345kV line 16703	137.0%	138.4%	Emergency	1341	Plano to Electric Junction Blue 345kV line 16704 ('345-L16704_B-S')
2m	U3-026	224.2	Collins to Kendall Red 345kV line 2310	120.7%	134.5%	Emergency	1528	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2n	U3-026	852.61	Wilton Center to Dumont 765kV line 11215	110.51	129.09	Emergency	4444	Collins to Plano 765kV line 2315 ('765-L2315___-S')
2o	U3-026	105.54	Plano to Electric Junction Blue 345kV line 16704	115.98	117.25	Emergency	1341	Plano to Electric Junction Red 345kV line 16703 ('345-L16703_R-S')
2p	U3-026	212.97	Dresden to Elwood Blue 345kV line 1220	97.17	111.57	Emergency	1479	Collins to Wilton Center 765kV line11216 ('765-L11216__-S')
2q	U3-026	168.09	Blue Island Red Tap to Blue Island Red 345kV line 11614	89.04	100.4	Emergency	1479	Wilton Center to Dumont 765kV line 11215 ('05DUMONT 765 - WILTO; 765 - 1')