#W3-052 –Kendall – Tazewell 345kV
Generation Interconnection

General

The Interconnection Customer (IC) is proposing a 200MW Energy (26 MW Capacity) wind farm to be interconnected to the ComEd transmission system. The proposed in-service date for this project is December 31, 2012 and is currently under review. **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.**

This Generation Interconnection Feasibility Study provides analysis results to aid the Interconnection Customer in assessing the practicality and cost of incorporating the facility into the PJM system. This study was limited to load flow analyses of probable contingencies. Preliminary estimates of the scope, cost, and lead time for construction of facilities are provided below. If the interconnection customer elects to pursue a System Impact Study, a more comprehensive analysis will be performed.

Option 1:

The W3-052 project was studied as a 200MW (26MW Capacity) injection at R-079 TAP 345kV substation in the ComEd area.

Direct Connection Cost Estimate

The total preliminary estimate for Direct Connection work performed by ComEd is given in the following table:

Description	Total Cost
Install new breaker at TSS 973 Dana substation - includes 345 kV Circuit Breaker, Dead End Structure, Motor Operated Disconnect Switch, foundations, wiring, conduit, CCVT and relaying	$3,500,000
Total	**$3,500,000**

Table 1. Direct Connection Cost Estimate

Revenue Metering and SCADA Requirements

For PJM: The Interconnection Customer (IC) will install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

For ComEd: The Interconnection Customer (IC) will install equipment necessary to provide bi-directional Revenue Metering (KWH, KVARH) and real time data (KW, KVAR, circuit breaker status, and 138 kV voltage) for IC's generating Resource. See ComEd Applicable Standards available on the PJM website ("TO Standards") – "Exelon Energy Delivery Interconnection Guidelines (Generators Greater than 20 MW)".

Network Impacts

The Queue Project W3-052 was studied as a 200.0MW (26 MW Capacity) injection into the R-079 TAP 345kV substation in the ComEd area. Project W3-052 was evaluated for compliance with reliability criteria for summer peak conditions in 2015. Potential network impacts were as follows:

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

No violations 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 violations were identified.

Short Circuit
(Summary of impacted circuit breakers)

To be determined in the System Impact Study.

Contribution to Previously Identified Overloads
(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

No violations were identified.

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 developer 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:

Item 1a. The KENDA;BUXXXX-LOCKP; BXXXX 345 kV line (from bus 274702 to bus 270810 ckt 1) loads from 92.43% to 101.7% (**DC power flow**) of its normal rating (1201 MVA) for non-contingency condition. This project contributes approximately 111.39 MW to the thermal violation.

Item 1b. The KATYD; BXXXX-DRESD; BXXXX 345 kV line (from bus 270790 to bus 270716 ckt 1) loads from 108.67% to 110.89% (**DC power flow**) of its normal rating (1479 MVA) for the single line contingency ('345-L19601_B-S'). This project contributes approximately 32.46 MW to the thermal violation.

CONTINGENCY '345-L19601_B-S' / CONTINGENCY # 633
TRIP BRANCH FROM BUS 270790 TO BUS 270770 CKT 1 / KATYD; B 345 GOODI;4B 345
END

Option 2:

The W3-052 project was studied as a 200MW (26MW Capacity) injection into the Katydid Road(Blue) – Dresden (Blue) 345kV line in the ComEd area.

Attachment Facilities

The Interconnection Customer is proposing to construct a 200MW Energy (26MW Capacity) wind farm to be connected to the Powerton - Dresden 345kV line in ComEd. To accommodate this interconnection, a new three-breaker ring bus will have to be built to tap the line. If this option is chosen interconnection costs will be provided in the System Impact study phase.

The Interconnection Customer is responsible for constructing all of the facilities on the Interconnection Customer's side of the Point of Interconnection.

Network Impacts

The Queue Project W3-052 was studied as a 200.0MW (26 MW Capacity) injection into the Katydid Road(Blue) – Dresden (Blue) 345kV line in the ComEd area. Project W3-052 was evaluated for compliance with reliability criteria for summer peak conditions in 2015. Potential network impacts were as follows:

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

No violations 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 violations were identified.

Short Circuit
(Summary of impacted circuit breakers)

To be determined in the System Impact Study.

Contribution to Previously Identified Overloads
(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

No violations were identified.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially cause 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.)

None.

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 developer 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:

Item 2a. (AEP) The R-060 TAP-T-130_TAP 345 kV line (from bus 296566 to bus 292438 ckt 1) loads from 129.20% to 129.25% (DC power flow) of its emergency rating (878 MVA) for the operational contingency '05MARYSV _05DUMONT _118'. This project contributes approximately 11.75 MW to the thermal violation.

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CONTINGENCY '05MARYSV _05DUMONT _118'
  DISCONNECT BRANCH FROM BUS 242928 TO BUS 243206 CKT 1     /* 765/765KV, AREA 205/205.
END
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Item 2b. (CE) The W3-052-Dresden (Blue) 345 kV line (from bus 903663 to bus 270716 ckt 1) loads from 101.87% to 112.54% (DC power flow) of its emergency rating (1479 MVA) for the operational contingency '345-L19601_B-S'. This project contributes approximately 157.28 MW to the thermal violation.

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CONTINGENCY '345-L19601_B-S'     / CONTINGENCY # 633
  TRIP BRANCH FROM BUS 270790 TO BUS 270770 CKT 1          / KATYD; B 345 GOODI;4B 345
END
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