Queue R55
Dixon – Maryland 138kV
Feasibility Study Report

Network Impacts

The #R55 project was studied as a 100 MW (20 MW of capacity) injection into the Maryland to Sterling (Dixon) 138 kV line #12411 in the ComEd territory. Project #R55 was evaluated for compliance with reliability criteria for summer peak conditions in 2011. 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 only were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the System Impact Study)

No problems were identified.

Short Circuit

(Summary of impacted circuit breakers)

To be completed in the System Impact Study.

Contribution to Previously Identified Overloads

(#R55 contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

1. Contribution of 5 MW further overloads the bus tie 2-3 circuit breaker at TSS 113 Waterman from 175% to 177% of its applicable load dump rating (265 MVA) for the Walton Road (#P20) to Electric Junction and Plano to Electric Junction 345 kV tower line outage (#18402 & #16703). Projects prior to #R16 and #R33 & #R54 contribute to this overload. The System Impact Study for this project will define the cost allocation, if any, for this generation project. Rough estimates to eliminate the overload are around $1 million.
2. Contribution of 23 MW further overloads the Walton Road (#P20) to Electric Junction 345 kV line #18402 from 106% to 108% of its applicable load dump rating (1572 MVA) for the Cherry Valley to Silver Lake 345 kV line and Cherry Valley to Glidden 138 kV line tower outage (#15616 & #15627). This overload was first caused by the #R33 project with an additional contribution from project #R54. The System Impact Study for this project will define the cost allocation, if

any, for this generation project. Rough estimates to eliminate the overload are around $7.2 million.

Steady-State Voltage Requirements
(Summary of VAR requirements based upon the results of the steady-state voltage studies)

To be determined in the System Impact Study

Stability and Reactive Power Requirements for Low Voltage Ride Through
(Summary of 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 System Impact Study)

To be determined in the System Impact Study

Potential Issues

During certain maintenance outages the #R55 project will be required to be taken off line. For example, during a maintenance outage of 138kV line #15511, a single contingency of 138kV line #11902 from Lancaster to Baileyville Wind Farm (#K02_CE18) would island the wind generation at #R55 into the load at Sterling and Maryland. The typical duration of a maintenance outage on the ComEd system is one week.

Impacts on the MISO member transmission systems are not included in this analysis, but they will be included in the System 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.

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

1. Contribution of 31 MW further overloads the Lancaster to Freeport 138 kV line #11901 from 206% to 227% of its emergency rating (145 MVA) for the outage of Wempletown to Lancaster Wind Farm (#K04_CE19) 138 kV line #17121. This overload was caused by projects prior to PJM R-Queue with additional contributions from projects #R16 and #R33.
2. Contribution of 17 MW further overloads the Lancaster to Freeport 138 kV line #11901 from 132% to 145% of its normal rating (140 MVA). This overload was first caused by project #R16.
3. Contribution of 5 MW further overloads the station equipment in series with the bus tie circuit breaker 2-3 at TSS 113 Waterman from 215% to 217% of its emergency rating (215 MVA) for the outage of Walton Road (#P20) to Electric Junction 345 kV line (#18402). This overload was caused by projects prior to PJM R-Queue with additional contributions from project #R16, #R33 and #R54.
4. Contribution of 31 MW further overloads the Freeport to Titan Tire Co. Tap portion of 138 kV line #19414 from 120% to 137% of its emergency rating (182 MVA) for the outage of Wempletown to Lancaster Wind Farm (#K04_CE19) 138 kV line #17121. This overload was first caused by the #R16 project.
5. Contribution of 21 MW further overloads the Walton Road (#P20) to Electric Junction 345 kV line #18402 from 134% to 135% of its emergency rating (1234 MVA) for the outage of Byron to Lee Co. Energy Center 345 kV line #0627. This overload was caused by projects prior to PJM R-Queue with additional contributions from project #R16, #R29, #R33 and #R54.