

# Queue S62

## LaSalle – Braidwood 345kV

### Feasibility Study Report

#### Network Impacts

The #S62 project was studied as a 500 MW (100 MW Capacity) injection into the LaSalle County to Braidwood Blue 345 kV line #0104 in the ComEd area. Project #S62 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

#### Generator Deliverability

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

1. Contribution of 10 MW overloads the East Frankfort to Goodings Grove Blue 345kV line #11601 from 100.0% to 100.7% of its emergency rating (1452 MVA) for the outage of the East Frankfort to Goodings Grove Red 345kV line #11602 and subsequent tripping of the East Frankfort 345/138 kV transformer TR83 (System Planning Operating Guide, SPOG: 3-29).
2. Contribution of 10 MW overloads the East Frankfort to Goodings Grove Red 345kV line #11602 from 99.3% to 100.2% of its normal rating (1141 MVA).

#### 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

*(#S62 contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)*

None

### **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 Requirement 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)*

1. The overloads of the ComEd-owned East Frankfort to Goodings Grove 345kV lines #11601 and #11602 can be relieved by reconductoring 10.8 miles of 345kV double-circuit transmission line. Assume that the two (2) upgraded circuits will require a new wire size of 2,156 kcmil ACSR, moderate modifications to fifty-five (55) double-circuit suspension towers, and the replacement of six (6) existing double-circuit dead-end towers with new steel poles. This has been roughly estimated to cost \$24,500,000.

### **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)*

None

### **Potential Issues**

Due to the proposed interconnection of the #S62 project in the area near two nuclear stations, LaSalle County and Braidwood, there may be additional costs and schedule impacts incurred by the Developer. The proposed project will most likely cause a Line Identification Change, general description changes, revisions to technical specifications and labeling, and the need for training. There is a high possibility that the licensing documents for one or both nuclear plants will be impacted.

The #S62 project may impact stability at the nuclear stations at LaSalle and Braidwood due to the interconnection on 345kV line #0104. Stability studies will be performed during the System Impact Study.

**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 developer 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 49 MW further overloads the Conastone- Peachbottom 500 kV ckt#2 from **205%** to **207.0%** (DC power flow) of its emergency rating (2598 MVA) for the Conastone- Peachbottom 500 kV ckt#1 single line outage (PJM17). Previous project(s) S06, S12, S14, S17, S18, S23, S26, S29, S31, S32, S33, S36, S37, S45, S46, S51, S52, S54, S55, S56, S57 and S58 contribute(s) to the loading by 20MW(.8%), 131.4MW(5.1%), 6.6MW(.3%), 35.8MW(1.4%), 198.9MW(7.7%), 78.1MW(3.0%), 7.4MW(.3%), 144.4MW(5.6%), 44.4MW(1.7%), 83.6MW(3.2%), 47.9MW(1.8%), 17.2MW(.7%), 17.2MW(.7%), 13.6MW(.5%), 19.5MW(.8%), 14.2MW(.5%), 86.5MW(3.3%), 14.3MW(.6%), 76.9MW(3.0%), 57.2MW(2.2%), 147.5MW(5.7%) and 196.3MW(7.6%) respectively. It must be noted that the same thermal violation (DC power flow: 149.8%) already exists in the 2012 base case.
2. Contribution of 49 MW further overloads the Conastone- Peachbottom 500 kV ckt#1 from **205%** to **207.0%** (DC power flow) of its emergency rating (2598 MVA) for the Conastone- Peachbottom 500 kV ckt#2 single line outage (PJM17\_2). Previous project(s) S06, S12, S14, S17, S18, S23, S26, S29, S31, S32, S33, S36, S37, S45, S46, S51, S52, S54, S55, S56, S57 and S58 contribute(s) to the loading by 20MW(.8%), 131.4MW(5.1%), 6.6MW(.3%), 35.8MW(1.4%), 198.9MW(7.7%), 78.1MW(3.0%), 7.4MW(.3%), 144.4MW(5.6%), 44.4MW(1.7%), 83.6MW(3.2%), 47.9MW(1.8%), 17.2MW(.7%), 17.2MW(.7%), 13.6MW(.5%), 19.5MW(.8%), 14.2MW(.5%), 86.5MW(3.3%), 14.3MW(.6%), 76.9MW(3.0%), 57.2MW(2.2%), 147.5MW(5.7%) and 196.3MW(7.6%) respectively. It must be noted that the same thermal violation (DC power flow: 149.8%) already exists in the 2012 base case.
3. Contribution of 28 MW further overloads the South Bend – Keystone 500 kV line from **135.0%** to **136.0%** (DC power flow) of its emergency rating (2595MVA) for the Kemptown – North North West 500 kV line (PJM13B\_NNWEST\_B). Previous project(s) S06, S12, S14, S31, S36, S37, S45, S46, S51, S52, S54, S55, S56, S57 and S58 contribute(s) to the loading by 11.4MW(.4%), 77MW(3.0%), 7.3MW(.3%), 25.4MW(1.0%), 9.8MW(.4%), 9.8MW(.4%), 8MW(.3%),

11.5MW(.4%), 8.2MW(.3%), 45.1MW(1.7%), 8.2MW(.3%), 43.9MW(1.7%), 33MW(1.3%), 84.5MW(3.3%) and 112.7MW(4.3%) respectively. It must be noted that the same thermal violation (DC power flow: 116.2%) already exists in the 2012 base case.

4. Contribution of 44 MW further overloads the Kemptown – North North West 500kV line from 242% to 244% (DC power flow) of its normal rating (2078 MVA). Previous project(s) S06, S12, S14, S17, S18, S26, S29, S31, S36, S37, S45, S46, S52, S54, S55, S56, S57 and S58 contribute(s) to the loading by 18.1MW(.9%), 120.5MW(5.8%), 6MW(.3%), 25.2MW(1.2%), 140.3MW(6.7%), 6.7MW(.3%), 96MW(4.6%), 40.3MW(1.9%), 15.6MW(.7%), 15.6MW(.8%), 12.2MW(.6%), 17.5MW(.8%), 84.9MW(4.1%), 13.5MW(.6%), 69.7MW(3.3%), 53.6MW(2.6%), 133.5MW(6.4%) and 177.5MW(8.5%) respectively. It must be noted that the same thermal violation (DC power flow: 192.5%) already exists in the 2012 base case.
5. Contribution of 35 MW further overloads the East Frankfort to Goodings Grove Blue 345kV line #11601 from 97% to 100.8% of its normal rating (1141 MVA).