#U2-069 Frackville 56 MW

Generator Interconnection

This analysis was completed to assess the reliability impact for a new generator interconnecting to the PJM System as a Capacity Resource.

Network Impacts (Option #1)

Queue U2-069 was studied as a 56 MW Energy (7.3 MW Capacity) injection into the Frackville-Mowry 69 kV line. Queue U2-069 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

NETWORK IMPACTS

Local System Impacts

(Normal system and contingency conditions per documented PPL EU 69 kV system Reliability Criteria with all facilities in service)

1. ***For the 69 kV option:***
   Frackville – Mowry 69 kV line is overloaded to **119.2%** of its normal rating (31 MVA). U2-069 causes this overload on a segment of the line for light load conditions. The cost to rebuild the overloaded line segment is approximately **$870,000**. (See NETWORK UPGRADE REQUIREMENTS)

Generator Deliverability

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

No problems identified.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)

No problems identified.

Short Circuit Analysis

TBD during the U2-069 Impact Study. There are no new breakers found overdutied but Queue U2-069 may have a cost allocation for some or all of five Frackville 69 kV breakers identified for Queue R27.

Stability Analysis

Will be performed for the U2-069 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 problems identified.

NETWORK UPGRADE REQUIREMENTS

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

1. ***For the 69 kV option:***
   The cost to rebuild the overloaded line segment of the Frackville – Mowry 69 kV line is estimated to be **$870,000**.

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 identified.

POTENTIAL ISSUES

Delivery of the Energy Portion of Interconnection Request
PJM also studied the delivery of the energy portion of this interconnection request with all earlier queues at their energy output and the system at peak load with all transmission facilities in service. Any problems identified below may result in operational restrictions to the project under study or to other PJM generation. There may also be other conditions causing congestion which were not studied. The generation developer can proceed with network upgrades to eliminate the potential congestion at their discretion by submitting a Merchant Transmission Interconnection request now or in the future. **These are not required reliability upgrades and are not a required to interconnect the subject generation.**

As a result of the aggregate energy resources in the area, the following potential congestion was identified:

1. **(PL/PL)** The Frackville 230-69 kV transformer tap to the Frackville – Eldred 230kV line loads from 122.4% to 126.8% of its emergency rating (526 MVA) for the single line contingency outage (PL3). This project contributes approximately 18.9 MW to the thermal congestion

2. **(PL/PL)** The Sunbury - Eldred 230kV line loads from 103.6% to 109.0% of its emergency rating (455 MVA) for the single line contingency outage (PL35). This project contributes approximately 23.1 MW to the thermal congestion.

Network Impacts (Option #2: Frackville – Columbia 230 kV line)

Not Evaluated.

PJM had prior discussion with the U2-069 Interconnection Customer after the Direct Connection results were available for both the 69 kV and 230 kV options. Because of the large difference in Direct Connection cost the Interconnection Customer decided to forego pursuing the 230 kV option.