Generation 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 -500 MW Injection into the East Towanda-Hillside 230kV transmission line (D24)

Network Impacts

A new substation is proposed at the east side of the Tower Hill 115kV substation where the generating plant is located. A new 230kV radial transmission line will be constructed from the new substation to tie into the East Towanda-Hillside 230kV circuit. The radial line is about 33 miles in length and will share right-of-way for a good portion of its length with the Mansfield-East Towanda 115kV line.

The East Sayre-North Waverly line was assumed to be normally open in the base case in accordance with existing emergency operating procedures.

Potential network impacts for the injection of 500 MW into the transmission System at West Towanda 230 kV substation were evaluated under summer peak conditions in 2005.

The Feasibility Study does not include an evaluation of what, if any, impacts this project will have on the New York ISO transmission system.

Normal System

No identified problems.

Multiple Facility Contingency – Tower Line Outages (MAAC Criteria IIC)

- No identified problems.

Generator Deliverability

- The generator causes the East Towanda-North Meshoppen 230kV circuit to be loaded to 105.3% of the emergency rating (554 MVA) due to the outage of the West Towanda-Hillside 230kV circuit.

- The generator causes the Hillside-West Towanda 230kV circuit to be loaded to 120% of its emergency rating (531 MVA) due to the outage of the East Towanda-North Meshoppen 230kV circuit and the North Meshoppen 230/115kV transformer.

- The generator causes the East Towanda-North Meshoppen 115kV circuit to be loaded to 101.2 % of the emergency rating (159 MVA) due to an outage of the

East Towanda-North Meshoppen 230 kV circuit and the North Meshoppen 230/115kV transformer.

Short Circuit

- No identified problem

System Reinforcements

To relieve the overloads on the East Towanda-N.Meshoppen 230 kV line:

- Upgrade the East Towanda-North Meshoppen 230 kV line to its 617 MVA 4-hour conductor rating by replacing one 1200 amp line trap and one current transformer at East Towanda with 2000 amp equipment. The estimated cost is $0.144 million with an estimated time to completion of 1 year.

To relieve the overloads on the West Towanda-Hillside 230 kV line:

- Install a 10% reactor in the East Sayre-North Waverly 115kV circuit at the East Sayre 115kV substation and operate this line normally closed. Remove the existing SPS overcurrent relay. The estimated cost is $0.345 million with an estimated time to completion of 6 months.

- At East Towanda and East Sayre 115kV substations change the current transformer tap settings to 1200/5 to increase the circuit rating to the conductor rating. The estimated cost is $0.058 million with an estimated time to completion of 9 months.

- Upgrade the West Towanda–Hillside 230 kV line to its 617 MVA 4-hour rating by replacing a 1200 amp line trap at Hillside with 2000 amp equipment. The estimated cost is $0.058 million with an estimated time to completion of 6 months.

- At East Towanda 230kV substation replace one 1200 amp wave trap and two 1200 amp current transformers with 2000 amp equipment to increase the circuit rating to the conductor rating on the East Towanda-West Towanda 230kV circuit. The estimated cost is $0.230 million with an estimated time to completion of 1 1/4 years.

To relieve the overloads on the East Towanda-N.Meshoppen 115 kV line:

- Upgrade the East Towanda – North Meshoppen 115 kV line to its 189 MVA 4-hour conductor rating replacing a 600 amp disconnect switch at East Towanda and line trap at North Meshoppen with 1200 amp equipment. The

estimated cost is $0.121 million with an estimated time to completion of 1 year 3months.

The total system reinforcement costs for the project is estimated at $.956 million with an anticipated time to completion of 4 years. The overall cost for the project is estimated to be $33.68 million with a time to completion of 4 years. Note that these costs do not include a gross-up for state and federal taxes as this will be an issue addressed in the Interconnection Study Agreement. As reference, the current PA State tax is approximately 30%. Further note that the times for the direct connection and system reinforcements identified assumes no undue delay in the developer obtaining any necessary right-of-way for the direct connection circuits or the West Towanda Substation property.