

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 -100 MW Injection into the Ironwood 230kV substation and 50 MW into Ironwood 230kV substation and 50 MW into south Lebanon 69kV substation (H21)

Option #1

The #H21 project was studied as 100 MW capacity injection into the Ironwood (A01/C02 project) 230kV substation. Project # H21 was evaluated for compliance with reliability criteria for summer peak conditions in 2006. Potential network impacts were as follows:

Generator Deliverability

1. The Ironwood – South Lebanon Tap 230kV circuit is contingency overloaded at **102.9%** of the emergency rating (793 MVA) for the outage of the Ironwood – South Lebanon 230kV circuit. The H21 project contributes approximately 99MW to the loading on this circuit.
2. The Ironwood – South Lebanon 230kV circuit is contingency overloaded at **102.7%** of the emergency rating (793MVA) for the outage of the N. Hershey – S. Lebanon Tap - N. Temple 230kV circuit. The H21 project contributes approximately 99MW to the loading on this circuit.

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

3. The Ironwood – South Lebanon 230kV circuit is contingency overloaded at **102.9%** of the emergency rating (793 MVA) for the North Temple –North Hershey and North Temple – North Lebanon 230kV tower line outage. The H21 project contributes approximately 99MW to the loading on this circuit.

Short Circuit

No identified problems

New System Reinforcements

Overload #1 and 2 can be relieved by reconductoring the South Lebanon – Ironwood – South Lebanon Tap 230kV circuit. Below is a description of the work required.

Upgrade the 230 kV path from South Lebanon to Ironwood to a tap of the North Hershey-North Temple (1001) line by adding a second conductor on the vacant side of the double circuit towers and steel poles (see Figure #3).

- a. String 1590 45/7 KCMIL 45/7 ACSR conductor (125 degrees C) on the vacant side of the double circuit tower line from the Ironwood 230 kV substation to the North Hershey-North Temple (1001) 230 kV line near North Lebanon; approximately 5.13 miles.
- b. String 1590 45/7 KCMIL 45/7 ACSR conductor (125 degrees C) on vacant side of the double circuit tower and steel pole 230 kV line from Ironwood to South Lebanon (1054); approximately 2.79 miles.

- c. Tie both ends of each circuit together to form a two conductor single circuit configuration at South Lebanon, Ironwood (2), and the tap near North Lebanon.
The estimated cost to add a second set of conductors is **\$4,308,000** with an estimated time of one (1) year to complete from the signing of an Interconnection Agreement.

Figure #3

Contribution to Previously Identified System Reinforcements

The H21 project will contribute to the cost of the following previously identified network reinforcements:

1. Install a temporary series reactor on Brunner - West Hempfield 230 kV, replace one South Manheim 230 kV CB, PP&L lower voltage reactive compensation. The H21 project contributes approximately 6MW. The cost is estimated at \$4.5 million and it is already in service. This upgrade is a temporary solution prior to the completion of the new Yorkana-Otter Creek 230kV circuit, that is anticipated to be in service by June, 1, 2004. If the new line is not complete and this project desires full capacity interconnection rights at the time it goes into service, contributing an allocated portion of the cost for this project will allow those rights to be granted.

Cost allocation percentages are not provided as part of the Feasibility Study analysis, however, cost allocation will be provided during the Impact Study evaluations.

Option #2

The #H21 project was studied as 50 MW capacity injection into the Ironwood (A01/C02 project) 230kV substation and a 50 MW injection into the south Lebanon 69kV substation. Project # H21 was evaluated for compliance with reliability criteria for summer peak conditions in 2006. Potential network impacts were as follows.

Generator Deliverability

No identified problems

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

No identified problems.

Short Circuit

No identified problems

Contribution to Previously Identified System Reinforcements

The H21 project will contribute to the cost of the following previously identified network reinforcements:

2. Install a temporary series reactor on Brunner - West Hempfield 230 kV, replace one South Manheim 230 kV CB, PP&L lower voltage reactive compensation. The H21 project contributes approximately

6MW. The cost is estimated at \$4.5 million and it is already in service. This upgrade is a temporary solution prior to the completion of the new Yorkana-Otter Creek 230kV circuit, that is anticipated to be in service by June, 1, 2004. If the new line is not complete and this project desires full capacity interconnection rights at the time it goes into service, contributing an allocated portion of the cost for this project will allow those rights to be granted.

Cost allocation percentages are not provided as part of the Feasibility Study analysis, however, cost allocation will be provided during the Impact Study evaluations