P22 - Johnstown-Altoona 230 kV
Generation Interconnection

Network Impacts
The **#P22 project was studied as a total injection of 50 MW (10 MW of capacity) into a tap of the Altoona -- Johnstown 230 kV circui**t. Project #P22 was evaluated for compliance with reliability criteria for summer peak conditions in 2010. Potential network impacts were as follows:

Generator Deliverability – at the 10 MW capacity value level
No problem identified.

Multiple Facility Contingency – Reliability Requirements at the 50 MW full output level
No problem identified (no facility loading that exceeded the facility's normal or emergency rating).
NOTE: For Feasibility Studies, only double circuit (tower) outages are evaluated – not line fault and stuck breaker.

Contribution to Previously Identified Overloads
The P22 project contributes to the overload of the Huntingdon-OC1Tap 46 kV line, the WRH Tap-OC1 Tap 46 kV line and the Warrior Ridge-WRH Tap 46 kV line. It contributes 2% (or 0.84 MW) to the overload condition for the loss of the Altoona-Raystown 230 kV line. This overload condition was previously identified in PJM Queues N39, O38 and P01. If this 46 kV line is not upgraded because the N39, O38 and P01 projects fail to go forward, this P22 project will require the replacement/upgrade of the 46 kV line conductor.

New System Reinforcements

Contribution to Previously Identified System Reinforcements
None

Short Circuit
Under study

PJM and FirstEnergy 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. The P22 project contributes 3 MW to the overload of the Glory-Dixonville 115 kV line for the outage of the Homer Ct-Shelocta-Keystone 230 kV circuit, which was originally caused by the energy portion of #O56 project.

2. The P22 project contributes 13 MW to the overload of the Altoona to P22 Tap 230 kV line for the outage of the Juniata-Keystone 500 kV circuit, which was originally caused by the energy portion of #O38 project.
3. The P22 project contributes to the overload of the Altoona-N39/O38/P22 230 kV transmission line under normal operating conditions. It loads the Altoona-N39/O38/P22 230 kV transmission line to 108%. It contributes an additional 15 MW to the overload previously identified for the energy portion of Project P01.
4. The Keystone 500/230kV transformer 4 loads to 103% of its emergency rating (465 MVA) for the outage of the Keystone 500/230kV transformer #3. The energy portion of #P22 contributes approximately13 MW to this condition.
5. The Keystone 500/230kV transformer #3 loads to 103% of its emergency rating (471 MVA) for the outage of the Keystone 500/230kV transformer 4. The energy portion of #P22 contributes approximately13 MW to this condition.
6. The P22 project contributes 16 MW to the overload at the Homer Ct-Shelocta for the outage of the Handsome Lake to Wayne 345 kV circuit, which was originally caused by the #O56 project.
7. The P22 project contributes to the loading of the Meadows-EH1 Tap 46 kV line. It contributes to the line loading to 100% of its emergency rating for the loss of the Altoona-N39/O38/P22 230 kV line.
8. The P22 project contributes to the overload of the Raystown-Huntingdon 46 kV line. It contributes 3% (or 1.32 MW) to the overload condition for the loss of the Altoona-Raystown 230 kV line. It will require the replacement/upgrade of transmission line conductor.

Other Concerns

The P22 project contributes to the overload of the Huntingdon-OC1Tap 46 kV, the WRH Tap-OC1 Tap 46 kV line and the Warrior Ridge-WRH Tap 46 kV line. It contributes 4% (or 1.68 MW) to the overload condition for the loss of the Altoona-Raystown 230 kV line. This overload condition was previously identified in PJM Queues N39, O38 and P01. If this 46 kV line is not upgraded because the N39, O38 and the P01 projects fail to go forward, this P22 project will require the replacement/upgrade of the 46 kV line conductor.