T109 – Keystone 500kV
Generation Interconnection

Preface

The Queue Position #T109 project was studied as a 20 MW (capacity) injection at the Keystone, 500kV substation. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

Direct Connection

None identified

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.

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 were identified.

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

None

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

Delivery of Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of this Interconnection Request. Any problems identified below may result in operational restrictions to the project under study. The developer may proceed with Network Upgrades to eliminate the operational restriction at their discretion by submitting a Transmission Interconnection Request.

As a result of the aggregate energy resources in the area, the following violations were identified:

1. The HOMER CITY-SHELOCTA 230kV line loads from 140% to 141% (1012 MVA) of its normal rating (718MVA) under non-contingency conditions. This project contributes approximately 5MW to the thermal violation. To mitigate this overload would require the replacement/upgrade of line trap (estimated to cost approximately $125,000), CT circuit (estimated to cost approximately $140,000), circuit breaker (estimated to cost approximately $425,000) and disconnect switch (estimated to cost $85,000) at Homer City 230 kV substation and the reconductor of approximately 10.73 miles of 230 kV transmission line (estimated to cost approximately $5,365,000).

2. The HOMER CITY-SHELOCTA 230kV line loads from 122% to 123% (1115 MVA) of its emergency rating (909MVA) for the single line outage of the Garrett 138/115 kV transformer. This project contributes approximately 5 MW to the thermal violation. To mitigate this overload would require the replacement/upgrade of line trap (estimated to cost approximately $125,000), CT circuit (estimated to cost approximately $140,000), circuit breaker (estimated to cost approximately $425,000) and disconnect switch (estimated to cost $85,000) at Homer City 230 kV substation, the replacement/upgrade of substation conductor (estimated to cost approximately $125,000) at Shelocta Substation and the reconductor of approximately 10.73 miles of 230 kV transmission line (estimated to cost approximately $5,365,000).

3. The SHELOCTA-KEYSTONE 230kV line loads from 151 to 152% (1054 MVA) of its normal rating (694 MVA) under non-contingency conditions. This project contributes approximately 5MW to the thermal violation. To mitigate this overload would require the replacement/upgrade of a disconnect switch (estimated cost approximately $85,000) and substation conductor (estimated to cost approximately $250,000) at Shelocta 230 kV substation and the replacement/upgrade of a disconnect switch (estimated to cost approximately $85,000), two CT circuits (estimated cost approximately $280,000), and substation conductor (estimated to cost approximately $125,000) at Keystone 230 kV substation. It also requires the reconductor of approximately 2.26 miles of 230 kV transmission line (estimated to approximately $1,130,000).

4. The SHELOCTA-KEYSTONE 230kV line loads from 174% to 175% (1491 MVA) of its emergency rating (854MVA) for the single line outage of the Handsome Lake-Wayne 345 kV line (PN33A). This project contributes approximately 5MW to the thermal violation. To mitigate this overload would require the replacement/upgrade of a disconnect switch (estimated cost approximately $85,000) and substation conductor (estimated to cost approximately $250,000) at Shelocta 230 kV substation and the replacement/upgrade of a disconnect switch (estimated to cost approximately $85,000), two CT circuits (estimated cost approximately $280,000), substation conductor (estimated to cost approximately $125,000), and a line/wave trap (estimated to cost approximately $125,000) at Keystone 230 kV substation. It also requires

the reconductor of approximately 2.26 miles of 230 kV transmission line (estimated to approximately $1,130,000).

Short Circuit

Not required.