Generation Interconnection Feasibility Study Report

PJM Generation Interconnection Request Queue Position #U1-057 North Lebanon

950 MW (900 MW capacity)

October 2008

Preface

The intent of the Generation Interconnection Feasibility Study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

The proposed interconnection facilities must be designed in accordance with the FirstEnergy "Requirements for Transmission Connected Facilities" document. Procedures for gaining access to these standards can be found at the link below.

http://www.pjm.com/planning/trans-standard.html

In some instances an Interconnection Customer may not be responsible for 100% of the identified Network Upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Generation Interconnection Feasibility Study, but the actual allocation will be deferred until the System Impact Study is performed.

The Generation Interconnection Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities unless noted in the report. The project developer is responsible for acquiring any necessary right of way and real estate, as well as applying for and obtaining any and all permits unless prior agreement by interested parties allows for other arrangements. For properties currently owned by Transmission Owners, some permitting and real estate costs may be included in the study.

Cost and Timing Estimates

The estimates in this report do not include tax gross-up.

While the information in this transmittal is reasonable for the scope of work defined, it should, however, be noted that the cost figures and time estimates are conceptual in nature at this stage, as an engineering team has not been assigned to the project. Any change to the scope of work will require that the estimates be revisited. The costs are a best estimate, but the developer will be charged for actual costs. Any under-runs or over-runs will be reconciled at the conclusion of the project.

General

The Queue Position #U1-57 project was studied as a 950MW (Capacity=900MW) injection. Queue Position #U1-57 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. The Interconnection Customer has proposed a facility located approximately 1.5 miles east of Metropolitan Edison's North Lebanon 230kV substation. The Interconnection Customer requested evaluation of two separate options for the Point of Interconnection, the first option (Option 1) included studying the facility as an injection into the North Lebanon – North Temple 230kV double circuit tower line though a new substation located along the existing right of way. The second option (Option 2) was a study of the facility as an injection into the Juniata-Alburtis 500kV line.

Metering

The Interconnection Customer will be required to install and maintain metering and telemetry equipment to provide revenue metering and real-time telemetry data to PJM and the Transmission Owner. The PJM requirements for this equipment are listed in Appendix 2, section 8 of Attachment O to the PJM Tariff, as well as PJM Manuals 01 and 14D. The PJM and Transmission Owner requirements for Metering Equipment will be discussed in more detail in subsequent studies.

Design Requirements

The generation owner is responsible for specifying appropriate equipment and facilities such that the parallel generation is compatible with the FirstEnergy Transmission System. The generation owner is also responsible for meeting any applicable federal, state, and local codes. It is also the developer's responsibility to obtain any needed right-of-way between the plant site and FirstEnergy's facilities.

FirstEnergy will complete detailed relay coordination studies to identify off-site relay setting changes required due to this generation interconnection during the Facilities Study phase of this project. This may result in additional individual relay replacements being required. These relay replacements will be done at the cost of the developer.

Reactive Power

The Generation Interconnection Customer shall design its Customer Facility to maintain a composite power delivery at continuous rated power output at a power factor of at least 0.95 leading to 0.90 lagging.

Cost and Timing Estimates

While the information in this transmittal is reasonable for the scope of work defined, it should, however, be noted that the cost figures and time estimates are conceptual in nature at this stage, as an engineering team has not been assigned to the project. Any change to the scope of work will require that the estimates be revisited. The costs are a best estimate, but the Interconnection Customer will be charged for actual costs. Any under-runs or over-runs will be reconciled at the conclusion of the project.

Direct Connection Facilities

The proposed Interconnection Facilities must be designed in accordance with the FirstEnergy "Requirements for Transmission Connected Facilities" document. Procedures for gaining access to these standards can be found at the link below.

http://www.pjm.com/planning/trans-standard.html

Below are conceptual estimates for the engineering/construction associated with Direct Connection requirements based upon similar projects that have been designed and/or constructed.

Option #1

Item	Description	Conceptual Cost Estimate
1	New 5 breaker ring bus to include breakers (60kA), switches, bus bars and civil work. The substation will also include two (2) double circuit substation termination structures, and one (1) structure for the Interconnection Customers generator attachment line, fiber communications, protection and SCADA equipment	$6,400,000

Estimated Lead Time: 3.0 years from signed CSA

Notes:

- The above estimates do not include 1) tax gross-up, 2) property costs and site development up to rough grade which is to be provided by the developer, 3) interconnection metering and generation SCADA to be provided by the developer, and 4) engineering and field activities for design review and commissioning of the developer's facilities

Figure 1 provides a conceptual one line diagram of the Direct Connection Network Upgrades required to accommodate this project.

Option #2

Item	Description	Conceptual Cost Estimate
1	New 500kV 3 breaker ring bus switching station with a control building. The substation will also include one (1) structure for the Interconnection Customers generator attachment line, fiber communications and fiber building, wave traps, protection and SCADA equipment.	
2	5 miles of 230kV double circuit line from the Interconnection Customer's proposed facility to the new 3 breaker ring bus switching station in #1 above	
3	Relay and Control work at both the Alburtis and Juniata substations	

Total Cost Estimate: $28,627,071
Estimated Lead Time: 3.0 years from signed CSA

Notes:

- The above estimates do not include 1) tax gross-up, 2) property costs and site development up to rough grade which is to be provided by the developer, 3) interconnection metering and generation SCADA to be provided by the developer, 4) engineering and field activities for design review and commissioning of the developer's facilities, and 5) real estate costs

Figure 2 provides a conceptual one line diagram of the Direct Connection Network Upgrades required to accommodate this project.

Network Impacts
Potential network impacts were as follows:

OPTION 1:

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

No problems were identified.

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

1. The Ironwood-South Lebanon 230kV line loads from 99.96% to 157.5% (DC power flow) of its emergency rating (805MVA) for the tower line outage, North Lebanon-Middletown Junction and North Hershey-Hummelstown. To mitigate this overload would require installation of approximately 2.8 miles of 230kV conductor in a vacant location along an existing tower from Ironwood to South Lebanon, installation of double circuit structures at both the Ironwood and South Lebanon substations, replacement of drop loop and bus conductor at both the Ironwood and South Lebanon substations, and replacement of a disconnect switch at the South Lebanon substation. The total estimated cost for this reinforcement is approximately $2,460,000.

2. The South Lebanon-Berks 230kV line loads from 88.20% to 114.5% (DC power flow) of its emergency rating (559MVA) for the tower line outage, Lyons to North Temple and North Temple-Hosensack. To mitigate this overload would require reconductoring approximately 34.5 miles of 230kV conductor from South Lebanon to Berks, replacement of drop loop and bus conductor, one circuit breaker, and one CT at the South Lebanon substation. The total estimated cost for this reinforcement is $21,246,000.

3. The North Lebanon - Copperstone 230 kV line loads from 76.83% to 117.6% (DC power flow) of its emergency rating (554MVA) for the tower line outage, Lyons to North Temple and North Temple-Hosensack. This project contributes approximately 280.8MW to cause this thermal violation. To mitigate this overload would require the replacement of one circuit breaker and one CT at the North Lebanon substation. The total estimated cost for this reinforcement is approximately $540,000.

4. The North Hershey-Hummelstown 230kV line loads from 69.80% to 109.97% (DC power flow) of its emergency rating (574MVA) for the tower line outage, Lyons to North Temple and North Temple-Hosensack. This project contributes approximately 230.6MW to cause this thermal violation. To mitigate this overload would require the replacement of a wave trap and a 230kV disconnect switch at the Hummelstown substation. The total estimated cost for this reinforcement is approximately $150,000.

5. The Lyons-Alburtis 230kV line loads to 106.6% (DC power flow) of its emergency rating (805MVA) for the tower line outage, North Hershey - Ironwood Tap and U1-057 & Copperstone – North Lebanon 230 kV. To mitigate this overload would require the reconductor of approximately 15.8 miles of one side of the conductor along the double circuit from Lyons to Alburtis 230kV, and replacement of drop loop and bus conductor at both the Lyons and Alburtis substations. The total estimated cost for this reinforcement is approximately $9,560,000.

6. The Ironwood Tap – U1-057 230 kV line loads to 156.2% (DC power flow) of its emergency rating (805MVA) for the tower line outage, Lyons to North Temple and North Temple-Hosensack. To mitigate this overload would require the reconductor of approximately 2.5 miles of one side of the double circuit from Ironwood Tap to U1-057. The total estimated cost for this reinforcement is approximately $1,500,000.

7. The South Lebanon-Fifth and Green 69 kV line loads to 109% (DC power flow) of its emergency rating (80MVA) for the single contingency loss of the North Lebanon-U1-057 230kV line. To mitigate this overload would require the replacement of bus conductor at the Fifth and Green substation. The total estimated cost for this reinforcement is approximately $10,000.

8. The Fifth and Green-Third and Green 69 kV line loads to 110.3% (DC power flow) of its emergency rating (86MVA) for the single contingency loss of the North Lebanon-U1-057 230kV line. To mitigate this overload would require the rebuild of approximately .4 miles of conductor between the Fifth and Green and Third and Green substations. The total estimated cost for this reinforcement is approximately $74,000.

9. The Moselem Springs-St. Peters 69 kV line loads to 118.4% (DC power flow) of its emergency rating (86MVA) for the single contingency loss of the North Temple-Lyons 230kV line. To mitigate this overload would require the rebuild of approximately 1.4 miles of the circuit from Moselem Springs to St. Peters, and replacement of drop loop and bus conductor at the Moselem Springs substation. The total estimated cost for this reinforcement is approximately $288,000.

10. The North Lebanon 230/69 kV transformer#1 loads to 129.3% (DC power flow) of its emergency rating (126MVA) for the single contingency loss of the Ironwood to South Lebanon 230kV line. To mitigate this overload would require the replacement of the 230/69kV transformer. The total estimated cost for this reinforcement is approximately $3,088,000.

11. The North Temple - Rosedale 69 kV line loads to 108% (DC power flow) of its emergency rating (160MVA) for the single contingency loss of the North Temple to Riverview to Car Tech 69kV line. To mitigate this overload would require the replacement of one circuit breaker and one CT at the North Temple substation. The total estimated cost for this reinforcement is approximately $255,000.

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)

12. The North Temple-Hosensack 230kV line loads from 130.52% to 157.4% (DC power flow) of its emergency rating (624MVA) for the single line contingency outage North Temple - Lyons 230 kV.

13. The North Temple - Lyons 230 kV line loads from 104.25% to 135.49% (DC power flow) of its emergency rating (805MVA) for the single line contingency outage North Temple - Hosensack 230 kV.

    To mitigate overloads #12 & 13 would require the replacement of 12.09 miles of conductor on one side of the double circuit from North Temple to Lyons substations, replacement of a disconnect switch and drop loop and bus conductor at the North Temple substation, replacement of a circuit breaker, a disconnect switch, a line trap, a CT, and drop loop and bus conductor at the Lyons substation. It would also require replacement of approximately 2.6 miles of double circuit conductor from North Temple to Hosensack, replacement of a disconnect switch and drop loop and bus conductor at the North Temple substation, replacement of a circuit breaker, a disconnect switch, a CT, and drop loop and bus conductor at the Hosensack substation. The total estimated cost for this reinforcement is approximately $58,105,580.

14. The Cabot-Paradise Junction 138kV line loads from 188.28% to 193.24% (DC power flow) of its emergency rating (129MVA) for the tower line outage, loss of Cabot to Butler 138kV. This project contributes approximately 6.4MW to the thermal violation. To mitigate this overload would require the addition of approximately 3.1 miles of 138kV conductor and reconductoring approximately 3.1 miles of the existing 138kV line from Cabot to Paradise Junction, and at the Cabot substation, installation of a 138kV line terminal, a dead end structure, two (2) 138kV breakers, four (4) 138kV disconnect switches, 138kV bus and bus support structures, 138kV CVT's, line trap, control panels and associated equipment. The total estimated cost for this reinforcement is approximately $1,803,803.

15. The proposed Peach Bottom-Conastone #3 500kV line loads from 248.63% to 253.80% (DC power flow) of its emergency rating (2598MVA) for the tower line outage, loss of the Peach Bottom-Conastone #1 & #2 500kV lines. This project contributes approximately 134.2MW to the thermal violation.

    To mitigate this overload would require the following:

    BGE portion of the Conastone – Peach Bottom line:

    Conastone Substation 3 - 4 years to complete $39,000,000 add 5% per year inflation beyond 2012

    - Rebuild 3 existing bays to 4000A (also add breaker in one of the existing bays)
    - Build new 4000A bay and install 3 breakers

- Relocate Hunterstown 500kV line
- Replace 4 inch bus with 5 inch

Transmission Line Component 7 years to build after notice to proceed total estimate for this work is $ 292 Million

- 2 - Double Circuit 500 kV OH lines from Conastone - Graceton - MD line ($136)
- 2 – Upgrade 230 kV circuits from Conastone - Graceton ($122.4)*
- 1 - Upgrade 230 kV circuit from Graceton - MD line ($20.4)
- 1 - Upgrade 115 kV circuit from Graceton - Five Forks ($9.0)
- Acquire additional 50 ft. wide R/W Graceton - MD line ($2.2)
- Remove existing OH lines/structures ($2.0)

* assumes RTEP project b0497 Install a second Conastone - Graceton 230 kV circuit

PECO portion of the Conastone – Peach Bottom line:

This estimate assumes that PECO will be able to build 500 kV lines with ratings equal to the rating of the 4 inch diameter aluminum bus work at Peach Bottom, i.e. 3366 MVA normal and 4183 MVA emergency.

Relocate Peach Bottom to Graceton 220-08 line to underground (7.4 miles total length @ $4M/mile) to facilitate construction of additional 500kV lines in the Conastone to Peach Bottom right of way. The underground line will require parallel pipe type cables to achieve a rating of 800MVA, $61M and 36 months to complete. Please note that 220-08 line is an offsite source for Peach Bottom generating station and its integrity must be maintained.

Remove existing 220-08 line towers to clear the north side of the right of way for 500kV construction, $1.5M and 6 months.

Construct new double circuit 500kV line in the north side of the 300 foot wide Peach Bottom to Maryland state line right of way, approximately $17M (6.25 mile PECO portion @ $2.7M/mile) and 30 months to complete after the removal of the existing 230 kV tower line.

Remove existing 5012 line towers to clear the south side of the right of way for new higher capacity 500kV lines, $1.5M (6.25 mile PECO portion) and 6 months.

Construct second new double circuit 500kV line in the south side of the Peach Bottom to Maryland state line right of way, approximately $17M (6.25 mile PECO portion @ $2.7M/mile) and 30 months to complete after the removal of the existing 500 kV tower line.

Upgrade 5012 line substation equipment to achieve the new higher rating, $3M and 18 months to complete.

Expand 500kV substations (north and south) at Peach Bottom to accommodate three additional 500kV lines, approximately $18M ($6M per new line) and 30 months to complete. Please note that the substation work may have to be coordinated with refueling outages at Peach Bottom and that the overall project may overstress several 500 kV circuit breakers.

Total estimated cost for all work associated with this reinforcement: $450,000,000

16. The North Temple 230/69 kV Bank 6 transformer loads to 156.7% (DC power flow) of its emergency rating (377MVA) for the tower line outage, Lyons to North Temple and North Temple-Hosensack.

17. The North Temple 230/69 kV Bank 4 transformer loads to 106.1% (DC power flow) of its emergency rating (277MVA) for the tower line outage, Lyons to North Temple and North Temple-Hosensack.

    To mitigate overloads #17 & 18 would require the addition of an additional 230/69kV (224MVA) transformer (including associated support structures/equipment, e.g.: oil containment, protection equipment, civil work, etc.) at the North Temple substation, addition of a 230kV disconnect switch and breaker, and addition of a 69kV disconnect switch at the North Temple substation. The total estimated cost associated with this reinforcement is $4,825,000.

18. The Moselem Springs-Lyons 69kV line loads to 125.4% (DC power flow) of its emergency rating (63MVA) for the single contingency outage, loss of the Lyons to North Temple 230kV line. To mitigate this overload would require rebuilding approximately 4.26 miles of 69kV conductor and structures from Moselem Springs to Lyons, the replacement of droop loop and bus conductor at the Moselem Springs substation, and replacement of drop loop and bus conductor at the Lyons substation. The total estimated cost associated with this reinforcement is $1,551,000.

19. The Riverview-Car Tech 69kV line loads to 130.1% (DC power flow) of its emergency rating (128MVA) for the single contingency outage, loss of the North Temple-Rosedale-Muhlenburg 69kV line. To mitigate this overload would require rebuilding 3.17 miles of 69kV conductor and structures from Riverview to Car Tech, replacement of drop loop and bus conductor at the Car Tech and Riverview substations. The total estimated cost for this reinforcement is approximately $1,169,500.

20. The North Temple-Riverview 69kV line loads to 136.8% (DC power flow) of its emergency rating (144MVA) for the single contingency outage, loss of the North Temple-Rosedale-Muhlenburg 69kV line. To mitigate this overload would require the reconductoring of approximately 1.56 miles of 69kV line, replacement of a circuit breaker at the North Temple substation, and replacement of drop loop and bus conductor at the North Temple and Riverview substations. The total estimated cost for this reinforcement is approximately $684,000.

Short Circuit

PJM analysis indicates that a single breaker at the South Lebanon 230kV substation is overdutied due to the addition of this project. Cost estimates for the replacement of this breaker will be provided at the System Impact Study phase.

Steady-State Voltage Requirements

(Results of the steady-state voltage studies should be inserted here)

To be determined during the System Impact Study phase of the study of this project.

Stability and Reactive Power Requirement

(Results of the dynamic studies should be inserted here)

To be determined during the System Impact Study phase of the study of this project.

Delivery of Energy Portion of Interconnection Request

PJM 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 North Temple-Hosensack 230kV line loads from 129.2% to 169.9% (DC power flow) of its emergency rating (624MVA) for the single line contingency outage (ME28). This project contributes approximately 254.4MW to the thermal congestion.

2. The North Temple-Lyons 230kV line loads from 103.9% to 135.1% (DC power flow) of its emergency rating (805MVA) for the single line contingency outage (ME23). This project contributes approximately 251.5MW to the thermal congestion.

OPTION 2:

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

No problems were identified.

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

No problems were 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)

1. The North Meshoppen-Meshoppen reactor 230/115kV transformer loads to 194.1% (DC power flow) of its emergency rating (191MVA) for the single line contingency outage, the loss of the North Meshoppen to East Towanda 230kV line. This project contributes approximately 10.9MW to the thermal violation. To mitigate this overload requires the installation of a third 230/115kV transformer (including associated support equipment, e.g.: oil containment, protection equipment, and civil work), addition of 2 breakers, and replacement of a CT at the North Meshoppen substation. The total estimated cost for this reinforcement is approximately $5,407,000.

2. The Cabot-Paradise Junction 138kV line loads from 188.27% to 193.95% (DC power flow) of its emergency rating (129MVA) for the tower line outage, loss of Cabot to Butler 138kV. This project contributes approximately 7.3MW to the thermal violation. To mitigate this overload would require the addition of approximately 3.1 miles of 138kV conductor and reconductoring approximately 3.1 miles of the existing 138kV line from Cabot to Paradise Junction, and at the Cabot substation, installation of a 138kV line terminal, a dead end structure, two (2) 138kV breakers, four (4) 138kV disconnect switches, 138kV bus and bus support structures, 138kV CVT's, line trap, control panels and associated equipment. The total estimated cost for this reinforcement is approximately $1,803,803.

3. The proposed Peach Bottom-Conastone #3 500kV line loads from 248.64% to 255.05% (DC power flow) of its emergency rating (2598MVA) for the tower line outage, loss of Conastone to Peach Bottom #1 & #2 500kV lines. This project contributes approximately 166.5MW to the thermal violation.

   To mitigate this overload would require the following:

   BGE portion of the Conastone – Peach Bottom line:

Conastone Substation 3 - 4 years to complete $39,000,000 add 5% per year inflation beyond 2012

- Rebuild 3 existing bays to 4000A (also add breaker in one of the existing bays)
- Build new 4000A bay and install 3 breakers
- Relocate Hunterstown 500kV line
- Replace 4 inch bus with 5 inch

Transmission Line Component 7 years to build after notice to proceed total estimate for this work is $ 292 Million

- 2 - Double Circuit 500 kV OH lines from Conastone - Graceton - MD line ($136)
- 2 – Upgrade 230 kV circuits from Conastone - Graceton ($122.4)*
- 1 - Upgrade 230 kV circuit from Graceton - MD line ($20.4)
- 1 - Upgrade 115 kV circuit from Graceton - Five Forks ($9.0)
- Acquire additional 50 ft. wide R/W Graceton - MD line ($2.2)
- Remove existing OH lines/structures ($2.0)

* assumes RTEP project b0497 Install a second Conastone - Graceton 230 kV circuit

PECO portion of the Conastone – Peach Bottom line:

This estimate assumes that PECO will be able to build 500 kV lines with ratings equal to the rating of the 4 inch diameter aluminum bus work at Peach Bottom, i.e. 3366 MVA normal and 4183 MVA emergency.

Relocate Peach Bottom to Graceton 220-08 line to underground (7.4 miles total length @ $4M/mile) to facilitate construction of additional 500kV lines in the Conastone to Peach Bottom right of way. The underground line will require parallel pipe type cables to achieve a rating of 800MVA, $61M and 36 months to complete. Please note that 220-08 line is an offsite source for Peach Bottom generating station and its integrity must be maintained.

Remove existing 220-08 line towers to clear the north side of the right of way for 500kV construction, $1.5M and 6 months.

Construct new double circuit 500kV line in the north side of the 300 foot wide Peach Bottom to Maryland state line right of way, approximately $17M (6.25 mile PECO portion @ $2.7M/mile) and 30 months to complete after the removal of the existing 230 kV tower line.

Remove existing 5012 line towers to clear the south side of the right of way for new higher capacity 500kV lines, $1.5M (6.25 mile PECO portion) and 6 months.

Construct second new double circuit 500kV line in the south side of the Peach Bottom to Maryland state line right of way, approximately $17M (6.25 mile PECO portion @ $2.7M/mile) and 30 months to complete after the removal of the existing 500 kV tower line.

Upgrade 5012 line substation equipment to achieve the new higher rating, $3M and 18 months to complete.

Expand 500kV substations (north and south) at Peach Bottom to accommodate three additional 500kV lines, approximately $18M ($6M per new line) and 30 months to complete. Please note that the substation work may have to be coordinated with refueling outages at Peach Bottom and that the overall project may overstress several 500 kV circuit breakers.

Total estimated cost for all work associated with this reinforcement: $450,000,000

Short Circuit

PJM analysis indicates that three breakers at the Alburtis 500kV substation are overdutied due to the addition of this project. Cost estimates for the replacement of these breakers will be provided at the System Impact Study phase.

Steady-State Voltage Requirements
(Results of the steady-state voltage studies should be inserted here)

To be determined during the System Impact Study phase of the study of this project.

Stability and Reactive Power Requirement
(Results of the dynamic studies should be inserted here)

To be determined during the System Impact Study phase of the study of this project.

Delivery of Energy Portion of Interconnection Request
PJM 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 Laurel Lake-Goudy 115kV line loads from 180.8% to 185.8% (DC power flow) of its emergency rating (129MVA) for the single line contingency outage (PN20). This project contributes approximately 6.4MW to the thermal congestion.

2. The Tiffany-Laurel Lake 115kV line loads from 149.3% to 153.6% (DC power flow) of its emergency rating (151MVA) for the single line contingency outage, loss of the East Towanda-Hillside 230kV (PN20). This project contributes approximately 6.4MW to the thermal congestion.

3. The North Meshoppen-Meshoppen Reactor 230/115kV transformer loads from 231.3% to 238.3% (DC power flow) of its emergency rating (157MVA) for the single line contingency

outage (PN47B). This project contributes approximately 10.9MW to the thermal congestion.

Figure #1

(Option #1)

Figure #2

(Option 2)