Gritmon, Marcie M.

From: Berner, Aaron
Sent: Friday, January 30, 2009 3:49 PM
To: Charles Vogel
Cc: Mittan, Jeannette; Gritmon, Marcie M.; kwesber@firstenergycorp.com
Subject: Queue Position #U3-013 Generation Interconnection Feasibility Study
Attachments: PJMDOCS-#523655-v1-U3-013_SISA.pdf; PJMDOCS-#522668-v2-U3-013 _Feasibility_Study.pdf

Chuck,

Attached is a report documenting the results of the U3-013 Generation Interconnection Feasibility Study. The results of these studies are predicated on a year 2012 transmission system, based on PJM's best assumptions at the present time for load growth and for connection of proposed new generation additions.

Please respond acknowledging receipt of this email with attachments.

Generation Interconnection Feasibility Studies are performed to determine the facilities required for interconnection and to define the cost and timing for construction of direct connection facilities and transmission network upgrades required for the reliable interconnection of a generation project to the transmission system. The direct connection facilities and network upgrade costs and associated timing described in the enclosed report are based upon estimates given to PJM by FirstEnergy. The costs are your responsibility as the Interconnection Customer. The project was evaluated for system normal conditions and single contingency outage conditions. In addition, tower line outages, which are anticipated to have a significant cost or timing impact on the interconnection of the projects, were assessed.

Pursuant to Section 204.3 of the PJM Tariff, attached is a System Impact Study Agreement for your consideration. The Agreement must be executed within thirty days (by close of business on **March 4, 2009**) to maintain the project's position in the queue. Please note that a refundable deposit of **$50,000** is required to accompany the signed Agreement. Two copies, with original signature on each, of the executed System Impact Study Agreement should be returned with the required study deposit to:

Jeannette Mittan
PJM Interconnection, L.L.C.
955 Jefferson Avenue, Business Center
Valley Forge Corporate Center
Norristown, PA 19403-2497
Phone: (610) 666-3158
FAX: (610) 666-4779

The following information is provided for wire transfers: Bank: PNC Bank, NA, New Jersey; ABA Number: 031-207-607; Account Number: 8013589826. Please e-mail Jeannette Mittan at mittaj@pjm.com with the project name, queue number, date and amount of wire.

In order to properly model this Interconnection Request, please provide the information requested on this link, http://www.pjm.com/planning/rtep-development/expansion-plan-process/form-impact-study-data.aspx, and submit it electronically.

Additionally, please ensure all requirements of Section 204.3 of the PJM Tariff are met. PJM shall require the all information by be supplied by **March 4, 2009.**

Please note that failure to return the executed System Impact Study Agreement, supply data as required by Section 204.3 of the PJM Tariff, and posting the study deposit as required per Section 204.3 of the PJM Tariff by the dates contained in this email, will result in this Interconnection Request being terminated and withdrawn.

Costs for the Generation Interconnection Feasibility Study are being tabulated and you will receive an invoice for any amount owed to PJM for the analysis.

If you desire to discuss the Generation Interconnection Feasibility Study Report or the System Impact Study Agreement in more detail, please call me at (610) 666-8951 or email me at bernea@pjm.com. A meeting or teleconference can be arranged for your convenience.

Aaron Berner
PJM Interconnection
955 Jefferson Drive
Norristown, PA 19403
Office 610-666-8951
Cell 610-945-6313
Fax 610-666-4779
bernea@pjm.com

Generation Interconnection Feasibility Study Report

PJM Generation Interconnection Request Queue Position #U3-013 Clermont 115kV

125 MW

(16.3 MW capacity)

January 2009

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/design-engineering/to-tech-standards.aspx

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 Interconnection Customer 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 Interconnection Customer 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 U3-013 project was studied as a 125MW and 16.3 MWC (capacity) injection into the PENELEC system at the Farmers Valley – Ridgeway 115 KV line. U3-013 was evaluated for compliance with reliability criteria for summer peak conditions in 2012.

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.

PENELEC Revenue Metering Requirements for Generation Interconnection Customer

Interconnection Customer shall install, own, operate, test and maintain the necessary revenue quality Metering Equipment. This includes current transformers, voltage transformers, mounting structures, wiring, meters, communication circuits, and associated devices. The Metering Equipment must meet the specifications listed in the FirstEnergy connection documents. The FirstEnergy "Requirements for Transmission Connected Facilities" can be retrieved from:

http://www.pjm.com/planning/design-engineering/to-tech-standards.aspx

The Metering Equipment shall be located at the generation facility on the high voltage side of the generator step-up transformers or facility main step-up transformer and/or station service power transformers. Power flows to and from the facility shall be compensated to the Point of Interconnection.

Penelec will provide revenue quality Metering Equipment for a station service power supply at a generation facility if the supply is from the local Penelec distribution system.

The revenue quality Metering Equipment shall be capable of collecting and storing bidirectional billing data. The billing data shall be stored in intervals specified by Penelec, typically fifteen minutes or thirty minutes. The Interconnection Customer must provide Penelec with remote access to the billing data in the Metering Equipment via a dedicated voice-grade analog telephone circuit. The Interconnection Customer shall provide Penelec with contact information for the person or persons responsible for meter programming and Metering Equipment maintenance.

The Interconnection Customer shall consult with Penelec regarding the revenue quality metering system design and provide the following information:

- Facility one line and revenue metering installation drawings (schematics, wiring diagrams, etc.)
- Estimated power flows to and from the facility at all revenue metering points
- Current transformer and voltage transformer specifications, including manufacturer, type, nameplate drawings, and certified accuracy test reports
- Revenue meter specifications including manufacturer, type, model number, and accuracy

- Revenue meter program information including but not limited to billing data recorder channel assignments, recorder pulse weights (Ke), and read-only password for access to interval data by the FirstEnergy billing data collection system (MV-90)
- Revenue meter telephone number
- Revenue meter loss compensation data (if applicable)

The Interconnection Customer shall provide Penelec with prior notification of any modifications at the facility that will affect the revenue meter measurements, including substation reconfigurations and meter program changes.

The revenue metering system at each location shall be tested for accuracy by the Interconnection Customer once every two years. The Interconnection Customer shall give reasonable notice to Penelec of the time when the testing is scheduled so that Penelec may have representatives present. Penelec shall have the right to audit the revenue Metering Equipment and/or related documents. The Interconnection Customer shall be given a reasonable period of time to comply with any requests associated with an audit.

Design Requirements

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

Penelec will complete detailed relay coordination studies to identify off-site relay setting changes required due to this generation interconnection during the Facilities Study on construction 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 Interconnection Customer.

Reactive Power

Requirements to be provided during the System Impact Study or Facilities Study phase of the project studies.

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.

Cost Estimates provided in this report were derived from estimates received in association with other similar projects.

Direct Connection Facilities

The Interconnection Customer is responsible for constructing all of the facilities on its side of the Point of Interconnection.

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/design-engineering/to-tech-standards.aspx

Below are conceptual estimates for the engineering/construction associated with direct connection requirements based upon similar projects that have been designed and/or constructed. The cost below is based on U3-013 being the only project to connect at this substation.

Item	Description	Conceptual Cost Estimate
1	New 115 kV 3-breaker ring bus termination point at a new interconnection substation.	$3,263,000
2	New 115 kV loop into interconnection substation.	$250,000
3	115 kV transmission line extending from the new interconnection substation structure to the generation plant substation.	N/A Interconnection Customer cost. Line built, owned and maintained by the Interconnection Customer.
4	Relay and control work at the Ridgeway 115kV substation	$250,000
5	Relay and control work at the Farmers Valley 115kV substation	$250,000
	Additional communications and control evaluations to occur during the System Impact Study may require the installation of fiber optic cable	

Conceptual Estimate: $4,013,000
Estimated Lead Time: 2.0 years from signed CSA

Notes:
Detailed Engineering & Construction Estimates to be determined during subsequent phase(s) of this projects development.
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 Interconnection Customer, 3) interconnection metering

and generation SCADA to be provided by the Interconnection Customer, 4) engineering and field activities for design review and commissioning of the Interconnection Customer's facilities, and 5) Real estate costs that may be required for right-of-way easements to extend the 115 kV line.

Potential network impacts were as follows:

Network Impacts
Potential network impacts were as follows:

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

1. The U3-013 – Farmers Valley 115 kV line loads from 98% to 100% of its emergency rating (146 MVA) for the single contingency outage of the Lewis Run 115/34.5 kV #1 transformer. This project contributes 3 MW to cause the overload. To mitigate this overload would require the reconductoring of what is assumed to be approximately 14 miles of 115kV conductor, also requiring terminal equipment replacement. The total estimated cost is $8,000,000.

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)

No problems were identified

Short Circuit

PJM studied the 230kV and above voltage systems and found no new breakers to be overdutied, and no addition to the fault current associated with any previously identified overdutied breakers. Additional short circuit study will be conducted during the System Impact Study phase of this project.

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 or Facilities 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 Interconnection Customer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overloaded conditions associated with the overloaded element(s) identified.

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

1. The Q72_TAP-South TR 115 kV line loads (bus# 95660- 380) from 345.69% to 359.94% (DC power flow) of its emergency rating (119 MVA) for the single line contingency outage (PN28). This project contributes approximately 16.96 MW to the thermal congestion.

2. The Mansfield-Q72_Tap 115 kV line loads (bus# 379- 95660) from 214.01% to 228.26% (DC power flow) of its emergency rating (119 MVA) for the single line contingency outage (PN28). This project contributes approximately 16.96 MW to the thermal congestion.

3. The Niles VA-Mansfield 115 kV line loads (bus# 378- 379) from 198.32% to 212.84% (DC power flow) of its emergency rating (119 MVA) for the single line contingency outage (PN28). This project contributes approximately 17.28 MW to the thermal congestion.

4. The N036C-Sabinsville 115 kV line loads (bus# 377- 378) from 197.7% to 208.71% (DC power flow) of its normal rating (130 MVA) for non-contingency condition. This project contributes approximately 14.32 MW to the thermal congestion.

5. The Sabinsville-Niles VA 115 kV line loads (bus# 422- 423) from 188.27% to 199.28% (DC power flow) of its normal rating (130 MVA) for non-contingency condition. This project contributes approximately 14.32 MW to the thermal congestion.

6. The Rockton-SHAWVL1 115 kV line loads (bus# 412- 290) from 141.6% to 166.81% (DC power flow) of its emergency rating (146 MVA) for the single line contingency outage (PN9). This project contributes approximately 36.81 MW to the thermal congestion.

7. The Lewis RN-Glade TP 230 kV line loads (bus# 374- 412) from 138.29% to 159.19% (DC power flow) of its emergency rating (213 MVA) for the single line contingency outage (SouthTR_Q27). This project contributes approximately 44.51 MW to the thermal congestion.

8. The Lewis RN 115-230 kV transformer loads (bus# 374-412) from 135.6% to 155.39% (DC power flow) of its emergency rating (225 MVA) for the single line contingency outage (SouthTR_Q27). This project contributes approximately 44.51 MW to the thermal congestion.

9. The Forest 115-230 kV transformer loads (bus# 354-283) from 103.75% to 140.59% (DC power flow) of its emergency rating (192 MVA) for the single line contingency outage (PN40). This project contributes approximately 70.72 MW to the thermal congestion.

10. The Forest-01Elko 230 kV line loads (bus# 283-20175) from 121.02% to 137.31% (DC power flow) of its emergency rating (505 MVA) for the single line contingency outage (PN28). This project contributes approximately 82.25 MW to the thermal congestion.

11. The R-092C-Rockton 115 kV line loads (bus# 96914-422) from 112.55% to 132.55% (DC power flow) of its emergency rating (184 MVA) for the single line contingency outage (PN9). This project contributes approximately 36.81 MW to the thermal congestion.

12. The Ridgeway-Forest 115 kV line loads (bus# 284-354) from 94.87% to 128.55% (DC power flow) of its emergency rating (210 MVA) for the single line contingency outage (PN40). This project contributes approximately 70.72 MW to the thermal congestion.

13. The Ridgeway-Whestson 115 kV line loads (bus# 284-420) from 98.97% to 122.12% (DC power flow) of its emergency rating (159 MVA) for the single line contingency outage (PN9). This project contributes approximately 36.81 MW to the thermal congestion.

14. The Glade-Warren 230 kV line loads (bus# 296-522) from 108.75% to 121.46% (DC power flow) of its emergency rating (540 MVA) for the single line contingency outage (PN9). This project contributes approximately 68.62 MW to the thermal congestion.

15. The Gold-N036C 115 kV line loads (bus# 376-93270) from 108.98% to 120.0% (DC power flow) of its normal rating (130 MVA) for non-contingency condition. This project contributes approximately 14.32 MW to the thermal congestion.

16. The 01Shingl-Lewistwn 230 kV line loads (bus# 20248-214) from 107.86% to 115.59% (DC power flow) of its emergency rating (505 MVA) for the single line contingency outage (PN28). This project contributes approximately 39.07 MW to the thermal congestion.

17. The Whetston-Harvey Run 115 kV line loads (bus# 420- 429) from 88.78% to 111.64% (DC power flow) of its emergency rating (159 MVA) for the single line contingency outage (PN9). This project contributes approximately 36.35 MW to the thermal congestion.

18. The Glade TP-Forest 230 kV line loads (bus# 290- 283) from 97.86% to 103.92% (DC power flow) of its emergency rating (512 MVA) for the single line contingency outage (PN28). This project contributes approximately 31.00 MW to the thermal congestion.

19. The Farm VLY-Twomile 115 kV line loads (bus# 375- 370) from 90.12% to 100.19% (DC power flow) of its emergency rating (179 MVA) for the single line contingency outage (PN28). This project contributes approximately 18.03 MW to the thermal congestion.

20. The U3-012 – Lewis Run 115 kV line loads from 182% to 214% (DC power flow) of its emergency rating (146 MVA) for the single line contingency outage (N36 – Sabinsville – Niles Valley). This project contributes approximately 46 MW to the thermal congestion.

21. The U3-013 – Ridgeway 115 kV line loads from 128% to 182% (DC power flow) of its emergency rating (146 MVA) for the single line contingency (N36 – Sabinsville – Niles Valley). This project contributes approximately 79 MW to the thermal congestion.

22. The U3-012 – Lewis Run 115 kV line loads from 133% to 166% (DC power flow) of its normal rating (115 MVA) for non-contingency conditions. This project contributes approximately 38 MW to the thermal congestion.

23. The Farmers Valley – U3-012 115 kV line loads from 192% to 223% (DC power flow) of its emergency rating (146 MVA) for the single line contingency outage (SOUTHTR_Q72). This project contributes approximately 45 MW to the thermal congestion.

24. The U3-013 – Farmers Valley 115 kV line loads from 92% to 110% (DC power flow) of its normal rating (146 MVA) for the single line outage (PN40). This project contributes approximately 26 MW to the thermal congestion.

25. The Keystone 500/230 kV transformer #4 loads from 105% to 108% (DC power flow) of its emergency rating (530 MVA) for the single contingency outage (PJM 30). This project contributes approximately 14 MW to the thermal congestion.

26. The Keystone 500/230 kV transformer #3 loads from 105% to 108% (DC power flow) of its emergency rating (534 MVA) for the single contingency outage (PJM 31). This project contributes approximately 14 MW to the thermal congestion.

27. The Homer CT-Shelocta 230 kV line loads from 142% to 144% (DC power flow) of its emergency rating (854 MVA) for the single line contingency outage (PN48A). This project contributes approximately 13 MW to the thermal congestion.

28. The Shelocta - Keystone 230 kV line loads from 130% to 132% (DC power flow) of its emergency rating (854 MVA) for the single line contingency outage (PN33A). This project contributes approximately 16 MW to the thermal congestion.

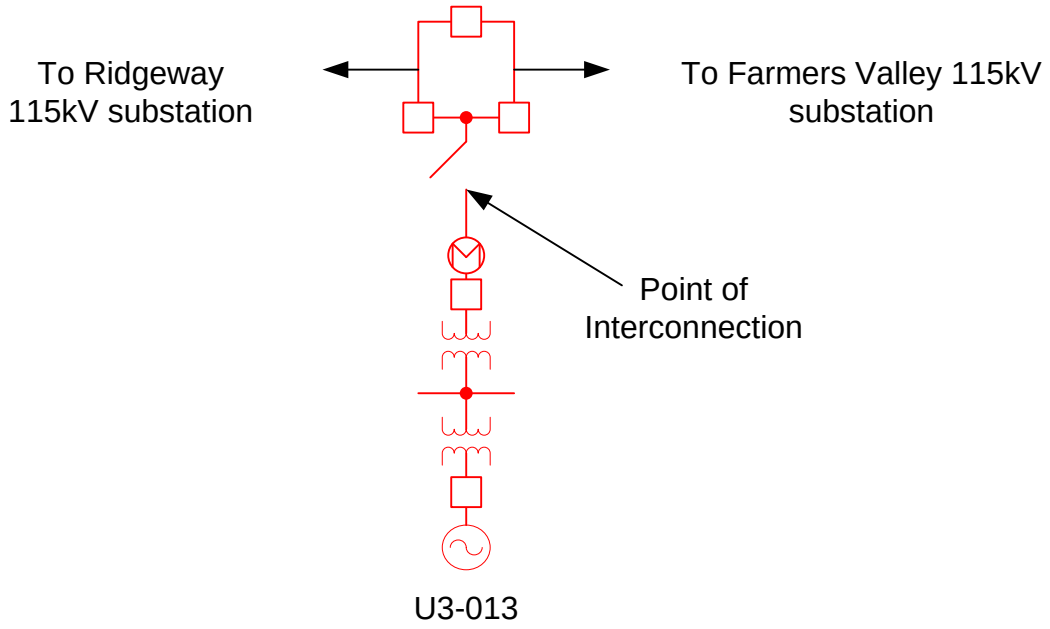
29. The Lewistown – Juniata 230 kV circuit loads from 99% to 103% (DC power flow) of its normal rating (499 MVA) for non-contingency conditions. This project contributes approximately 21 MW to the thermal congestion.

30. The Blairsville 138/115 kV transformer loads from 271% to 275% (DC power flow) of its emergency rating (140 MVA) for the single contingency (PN41). This project contributes approximately 6 MW to the thermal congestion.

31. The Blairsville – Social Hall 138 kV circuit loads from 218% to 221% (DC power flow) of its emergency rating (174 MVA) for the single contingency (PN41). This project contributes approximately 6 MW to the thermal congestion.

32. The U2-016 – East Towanda 230 kV line loads from 108% to 111% (DC power flow) of its emergency rating (554 MVA) for the single contingency outage (Towanda – U3-010 115 kV). This project contributes approximately 18 MW to the thermal congestion.

Figure 1



Legend

Generator

Breaker

Transformer

Disconnect Switch

Revenue Meter

All facilities depicted in black are existing facilities. All facilities depicted in red are facilities to be added as a result of this Interconnection Request.