#X2-031– Krayn 115kV
Generation Interconnection

Revenue Metering and SCADA Requirements

For PJM: The Interconnection Customer will install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for Interconnection Customer's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Section 24.1 to 24.2.

For Penelec: The Interconnection Customer will be required to comply with all FE Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "FirstEnergy Requirements for Transmission Connected Facilities" document located at the following links:
www.firstenergycorp.com/feconnect
www.pjm.com/planning/design-engineering/to-tech-standards.aspx

Network Impacts

The X2-031 project was studied as a 50MW (6.5MW Capacity) injection into the Penelec area at the O18 115kV substation. Project X2-031 was evaluated for compliance with reliability criteria for summer peak conditions in 2015.

Potential network impacts were as follows:

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

No violations were identified.

Multiple Facility Contingency
(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the Impact Study.)

No violations were identified.

Short Circuit
(Summary of impacted circuit breakers)

PJM has completed the short circuit analysis of the X2-031 queue project Krayn 115 kV. One option was considered during this study: the option was a direct connection to Krayn 115 kV Substation. No new breakers were found to be over-duty in the PENNELEC's transmission area.

Contribution to Previously Identified Overloads
(X2-031 contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

No violations were identified.

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

Not required.

Contribution to Previously Identified System Reinforcements
(Overloads initially caused by prior Queue positions with additional contributions to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study.)

Not required.

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.

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 overload conditions associated with the overloaded element(s) identified.

1. (AEP) The V1-010 TAP-Chatfield 138 kV line (from bus 892010 to bus 242984 ckt 1) loads from 268.67% to 269.17% (DC power flow) of its emergency rating (167 MVA) for the operational contingency '5147_B2_TOR707_V1-010A'. This project contributes approximately 5.14 MW to the thermal violation.

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CONTINGENCY '5147_B2_TOR707_V1-010A'
 OPEN BRANCH FROM BUS 243006 TO BUS 243039 CKT 1          / 243006 05FOSTOR 138 243039
05MELMOR 138 1
 OPEN BRANCH FROM BUS 243015 TO BUS 243039 CKT 1          / 243015 05GREENL 138 243039
05MELMOR 138 1
 OPEN BRANCH FROM BUS 243024 TO BUS 892000 CKT 1          / 243024 05HOWARD 138 243039
05MELMOR 138 1
END
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2. (AEP) The Chatfield-South Tiffin 138 kV line (from bus 242984 to bus 243110 ckt 1) loads from 186.25% to 186.78% (DC power flow) of its emergency rating (167 MVA) for the operational contingency '5147_B2_TOR707_V1-010B'. This project contributes approximately 5.55 MW to the thermal violation.

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CONTINGENCY '5147_B2_TOR707_V1-010B'
 OPEN BRANCH FROM BUS 243006 TO BUS 243039 CKT 1          / 243006 05FOSTOR 138 243039
05MELMOR 138 1
 OPEN BRANCH FROM BUS 243015 TO BUS 243039 CKT 1          / 243015 05GREENL 138 243039
05MELMOR 138 1
 OPEN BRANCH FROM BUS 892000 TO BUS 243039 CKT 1          / 243024 05HOWARD 138 243039
05MELMOR 138 1
END
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3. (AEP) The V1-010 TAP-Melmore 138 kV line (from bus 892000 to bus 243039 ckt 1) loads from 194.46% to 195.01% (DC power flow) of its emergency rating (167 MVA) for the operational contingency '5240_B2_TOR4783_WOMOAB_V1-010B'. This project contributes approximately 5.69 MW to the thermal violation.

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CONTINGENCY '5240_B2_TOR4783_WOMOAB_V1-010B'
 OPEN BRANCH FROM BUS 242953 TO BUS 243110 CKT 1          / 242953 05AIRCO8 138 243110
05STIFFI 138 1
 OPEN BRANCH FROM BUS 242953 TO BUS 243137 CKT 1          / 242953 05AIRCO8 138 243137
05W.END 138 1
 OPEN BRANCH FROM BUS 892010 TO BUS 243024 CKT 1          / 242984 05CHATFL 138 243024
05HOWARD 138 1
 OPEN BRANCH FROM BUS 242984 TO BUS 243110 CKT 1          / 242984 05CHATFL 138 243110
05STIFFI 138 1
 OPEN BRANCH FROM BUS 242984 TO BUS 245656 CKT 1          / 242984 05CHATFL 138 245656
CHATFIEL 69.0 1
 OPEN BRANCH FROM BUS 243110 TO BUS 245630 CKT 1          / 243110 05STIFFI 138 245630 S
TIFFIN 69.0 1
 OPEN BRANCH FROM BUS 242953 TO BUS 245602 CKT 1          / 242953 05AIRCO8 138 245602
AIRCO L8 12.0 1
 OPEN BRANCH FROM BUS 245655 TO BUS 245656 CKT 1          / 245655 CARROTHR 69.0 245656
CHATFIEL 69.0 1
 OPEN BRANCH FROM BUS 245656 TO BUS 245670 CKT 1          / 245656 CHATFIEL 69.0 245670
NEWWASH8 69.0 1
END
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