**#Y2-065 – Valley – Raccoon 138kV**
**Generation Interconnection**

## General

The Interconnection Customer is proposing a 205MW (97MW Capacity) natural gas facility to be interconnected to the Duquesne transmission system and located in Beaver County, PA. The proposed in-service date for this project is June 1, 2017.

This Generation Interconnection Feasibility Study provides analysis results to aid the Interconnection Customer in assessing the practicality and cost of incorporating the facility into the PJM system.

# Facilities to Accommodate the Interconnection

## Scope of Direct Connection Work

The Y2-065 project will tap the Z-81 Valley - Raccoon 138kV line. To accommodate this interconnection, the project will be looped into the transmission line. The direct connects are estimated to cost approximately **$2,435,000**, with an extra **$1,007,000** tax gross-up if applicable, to interconnect and take **18 – 24 months** after the receipt of an executed Interconnection Service Agreement to complete this work. The cost estimate above does not include any of the upgrades listed in the Network Impacts section of the report. This estimate is a conservative high-level estimate for the lead-time of the proposed interconnection. If the Interconnection Customer elects to pursue the System Impact Study, a more comprehensive analysis will be performed. Delays could be based on weather, equipment lead-time, procurement of right of way, site preparation, and availability of outages to perform the work.

The following assumptions were made in preparation of this high-level cost estimate:

- It is assumed that the location for the proposed customer substation will be at the site of the existing St. Joseph Mineral 138kV substation.
- DLCO will construct two new poles along the existing 138kV transmission line to accommodate a new looped substation.
- The estimates provided do not include relocation of DLCO transmission facilities traversing the site of the proposed petrochemical facility or system reinforcements required to serve the petrochemical facility load.
- DLCO will be responsible for the engineering, purchase, and construction of the high voltage equipment from the 138kV line entrance to the metering point within the customer substation including the line disconnect switch, 138kV breakers, and metering.
- DLCO will be responsible for the engineering of the foundations, structural steel, UG conduit and grounding associated with the DLCO high voltage equipment.
- The customer will be responsible for the engineering, purchasing and construction of the customer substation.
- The customer will be responsible for the construction associated with the installation of the DLCO engineered and procured equipment located at the customer substation.
- The customer must meet all National, State, Local, and DLCO requirements and must share control of the customer-purchased circuit breaker.

- DLCO will install and maintain relay protection and communications equipment associated with line protection for the DLCO equipment at the customer substation.
- The line metering, protection, and supervisory control for the DLCO system will be located inside a customer provided secure and environmentally controlled structure within or adjacent to the customer substation.
- The customer is responsible for providing, installing, and maintaining the steel, foundations, conduit, grounding, fencing, and control house per DLCO specifications.
- The customer is responsible for providing station service for DLCO use per DLCO specifications. DLCO requests two independent sources of 200A, three-phase, four-wire 120/208 services.
- The customer is responsible for obtaining land for the interconnection substation per DLCO specification including but not limited to size, grading, and location.
- All customer substation equipment beyond the DLCO metering point must be coordinated and meet DLCO specification.

If any of the assumptions listed above are not true, the cost estimate may change.

The Interconnection Customer is responsible for constructing all of the Interconnection Customer-owned facilities on the Interconnection Customer's side of the Point of 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.

**Network Impacts**

The Y2-065 project was studied as a 205MW (97MW Capacity) injection into the Duquesne area as a tap of the 15STJOE 138kV substation. Project Y2-065 was evaluated for compliance with reliability criteria for summer peak conditions in 2016.

Potential network impacts were as follows:

**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, Line with Failed Breaker and Bus Fault contingencies for the full energy output)*

No problems identified.

**Short Circuit**
*(Summary of impacted circuit breakers)*

PJM has completed the short circuit analysis of the Y2-065 queue project **Valley-Raccoon 138kV**. One option was considered during this study: the option was a tap of the Valley – Raccoon 138kV line. PJM analysis found **2 new breakers** to be over-duty in the DUQUESNE transmission area. The new over-duty breakers are listed below:

| Bus_NO | BUS | BREAKER | Duty % with Y2-065_ATSI | Duty % without Y2-065_ATSI | Duty % Difference | Notes |
|---|---|---|---|---|---|---|
| 0 | BV Z2 138.kV | Z-37 RACOON | 100.60% | 99.90% | 0.07% | New Overduty |
| 0 | CRSCNTZ1 138.kV | Z-25 HOPEW | 100.40% | 99.90% | 0.80% | New Overduty |

The Beaver Valley Z-37 138kV line breaker will be replaced with a breaker with an interrupting capability of 63kA. The reclosing time of the Crescent Z-25 138kV breaker will be increased from 10 seconds to 15 seconds. The total cost of these upgrades is $**435,000** (with $**180,000** tax gross-up if applicable for a total cost of $**615,000)**.

**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)*

No violations were found.

**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.*

As a result of the aggregate energy resources in the area, no violations were identified.