#X3-053 –Homer – Seville 69kV
Generation Interconnection

General

The Interconnection Customer (IC) is proposing a 17.68MW (6.72MW Capacity) solar generation project to be interconnected to the ATSI transmission system in Lodi, OH. The proposed in-service date for this project is July 1, 2013.

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. This study was limited to load flow analyses of probable contingencies. Preliminary estimates of the scope, cost, and lead time for construction of facilities are provided below. If the interconnection customer elects to pursue a System Impact Study, a more comprehensive analysis will be performed.

Direct Connection Cost Estimate

The total preliminary estimate for Direct Connection work performed by ATSI is given in the following table:

Description	Total Cost
Install new 69kV three-breaker ring bus to accommodate project X3-053	$3,786,600
Loop/tie-in project X3-053 into the Homer – Seville 69kV transmission line	$102,100
Update line name references on nameplates and drawings at Homer substation associated with new X3-053 Interconnection substation.	$28,300
Update line name references on nameplates and drawings at Seville substation associated with new X3-053 Interconnection substation.	$28,300
Engineering Oversight and Commissioning	$126,300
Total	**$4,071,600**

Table 1. Direct Connection Cost Estimate

Notes:

- *Tax gross-ups are not included in upgrade costs. However, if applicable, apply the 19.34% tax gross-up.*
- *No FE-provided fiber required.*
- *The Interconnection Customer will be responsible for providing two fiber optic pairs for protection from X3-053 collector substation to new Interconnection three-breaker ring bus.*

Revenue Metering and SCADA Requirements

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

For ATSI: 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 Queue Project X3-053 was studied as a 17.68MW (6.72 MW Capacity) injection into the 02BRKSIDE 69.0kV line in the ATSI area. Project X3-053 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)

Not required.

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 identified.

New System Reinforcements
(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially cause 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.)

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 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, the following violations were identified:

Item 2a. (FE) The Brookside-POLK 69 kV line (from bus 238587 to bus 240502 ckt 1) loads from 86.88% to 90.78% (DC power flow) of its emergency rating (56 MVA) for the operational contingency 'B_TRAN1_CR_020'. This project contributes approximately 2.18 MW to the thermal violation.

```
CONTINGENCY 'B_TRAN1_CR_020'    /* TRAN 02WELLNG TO 02WELNGT 138-69 CK 3
DISCONNECT BRANCH FROM BUS 239167 TO BUS 239168 CKT 3    /* 02WELLNG 69.00
02WELNGT 138.00
END
```