

***PJM Generator Interconnection Request  
Queue #W1-056  
Ada-Dunkirk 69kV  
Feasibility Study Report***

**July 2010  
#604779**

## **Preface**

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, 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 feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners,

# **W1-056 Ada-Dunkirk 69kV Feasibility Study**

## **General**

The Interconnection Customer (IC) proposes to install PJM Project #W1-056, an 18.4 MW generating facility comprised of 8 Siemens 2.3 MW wind turbine generators. This project is an increase to the 50MW U1-059 interconnection request. This generation and U1-059 will connect to a new 3-breaker ring bus station that will be built for connection into the Ada-Dunkirk 69kV line approximately 4.3 miles from Dunkirk station. The proposed generating facilities are located in Hardin County, Ohio between the cities of Ada and Dunkirk, Ohio (See Exhibit 1). The projected in-service date is scheduled for April 2011.

## **Direct Connection**

There is no direct connection work required for the addition of the W1-056 project, since it will connect to the same facilities as the U1-059 project proposed by the IC. See exhibit #2.

## **Network Impacts**

Queue project W1-056 was studied as a(n) 18.4MW ( 2.4MW of which was Capacity) injection into AEP's system at the South Kenton 138kV substation. Project W1-056 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. 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 form of Cost allocation for breakers will be inserted here if any)*

No problems identified

## **System Reinforcements**

None.

## **Potential Congestion due to Local Energy Deliverability**

*(PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection Request. Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full deliverability for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the identified overloaded element(s). As a result of the aggregate energy resources in the area, the following violations were identified:*

***The congestion listed below was based upon U1-060 being at 200 MW and U2-042 being in service at 201 MW. U1-060 subsequently reduced its project to 151.8 MW and U2-042 has been withdrawn.***

1. The 05WINDFL-Fulton 138 kV line (from bus 243148 to bus 243011 ckt 1) loads from 148.66% to 155.69% (DC power flow) of its emergency rating (262 MVA) for the single line contingency ('5138\_B2\_TOR700\_U1-60A'). This project contributes approximately 18.4 MW to cause the thermal violation.
2. The 05N WALD-05WINDFL 138 kV line (from bus 243048 to bus 243148 ckt 1) loads from 204.32% to 213.91% (DC power flow) of its emergency rating (192 MVA) for the single line contingency ('5138\_B2\_TOR700\_U1-60A'). This project contributes approximately 18.4 MW to cause the thermal violation.
3. The West Newton-East Lima 138 kV line (from bus 243155 to bus 242989 ckt 1) loads from 208.74% to 216.93% (DC power flow) of its normal rating (156 MVA) for non-contingency condition. This project contributes approximately 12.77 MW to cause the thermal violation.
4. The 05BLMF Z-05WMTVER 138 kV line (from bus 242963 to bus 243153 ckt 1) loads from 207.93% to 217.93% (DC power flow) of its emergency rating (184 MVA) for the single line contingency ('5138\_B2\_TOR700\_U1-60A'). This project contributes approximately 18.4 MW to cause the thermal violation.
5. The U1-60 TAP-West Newton 138 kV line (from bus 292823 to bus 243155 ckt 1) loads from 211.3% to 219.48% (DC power flow) of its normal rating (156 MVA) for non-contingency condition. This project contributes approximately 12.77 MW to cause the thermal violation.
6. The Fulton-05BLMF Z 138 kV line (from bus 243011 to bus 242963 ckt 1) loads from 209.78% to 219.78% (DC power flow) of its emergency rating (184 MVA) for the single line contingency ('5138\_B2\_TOR700\_U1-60A'). This project contributes approximately 18.4 MW to cause the thermal violation.

7. The West NEewton-East Lima 138 kV line (from bus 243155 to bus 242989 ckt 1) loads from 214.5% to 224.08% (DC power flow) of its emergency rating (192 MVA) for the single line contingency ('5182\_B2\_TOR748A\_MOAB'). This project contributes approximately 18.4 MW to cause the thermal violation.

8. The 05WILDC8-05N WALD 138 kV line (from bus 243147 to bus 243048 ckt 1) loads from 215.31% to 224.89% (DC power flow) of its emergency rating (192 MVA) for the single line contingency ('5138\_B2\_TOR700\_U1-60A'). This project contributes approximately 18.4 MW to cause the thermal violation.

9. The U1-60 TAP-West Newton 138 kV line (from bus 292823 to bus 243155 ckt 1) loads from 216.57% to 226.15% (DC power flow) of its emergency rating (192 MVA) for the single line contingency ('5182\_B2\_TOR748A\_MOAB'). This project contributes approximately 18.4 MW to cause the thermal violation.

10. The South Kenton-05WILDC8 138 kV line (from bus 243103 to bus 243147 ckt 1) loads from 216.57% to 226.15% (DC power flow) of its emergency rating (192 MVA) for the single line contingency ('5138\_B2\_TOR700\_U1-60A'). This project contributes approximately 18.4 MW to cause the thermal violation.