

## **#S71 – Bluff Point 138kV** **Generation Interconnection**

**This analysis was completed to assess the reliability impact for a new wind generator interconnecting to the PJM system as a capacity resource.**

### **Local Impacts**

The impact of the proposed generating facility on the AEP System was assessed for adherence with applicable reliability criteria. AEP planning criteria require that the transmission system meet single contingency performance criteria in accordance with the AEP FERC Form 715. Therefore, this criterion was used to assess the impact of the proposed facility on the AEP System. The AEPSC project was studied as a 120 MW net capacity consistent with the interconnection application. In addition, 75 MW of additional generation from #S26 was also modeled in the study both at Bluff Point Station and at an intermediate switching station between Bluff Point and Jay. The results are summarized below.

### **Normal System (2009 Summer Conditions)**

- No problems identified.

### **Single Contingency (2009 Summer Conditions)**

- Outage of the Bluff Point - Jay 138 kV circuit (or S26 - Jay 138 kV circuit) overloads the Bluff Point 138/69 kV transformer to 145% of its emergency rating (73 MVA) and the Bluff Point - Portland 69 kV line to 103% of its conductor rating (100 MVA).

### **Short Circuit Analysis**

- No problems identified.

### **Stability Analysis**

- Stability studies were not performed as part of this Feasibility Study and are not normally performed as part of a Facility Study effort. The stability assessments are part of the System Impact Study. Based upon the results of this future System Impact Study, the extent of system upgrades could change and the associated costs could be significantly different.

### **Local Upgrades**

To facilitate the #S71 generation, upgrades are required to the Bluff Point 138/69 kV transformer and the Bluff Point - Portland 69 kV line. The existing 138/69 kV 60 MVA transformer will need to be replaced with a 115 MVA unit. To mitigate the line overload, a 10% series reactor

and bypass circuit breaker can be installed on the 69 kV side of the transformer. The series reactor installation will still require replacement of the transformer, but will impede the contingency power flow sufficiently to alleviate the line overload. The need for these upgrades may change depending upon the status of #S26.

The AEP construction scope system upgrades:

- Replace the Bluff Point 138/69 kV transformer with a 115 MVA unit.

Estimated Cost (2007 Dollars)\*: **\$1,700,000**

- Install a 69 kV 10% series reactor and 69 kV bypass circuit breaker at Bluff Point Station.

Estimated Cost (2007 Dollars)\*: **\$700,000**

Total Estimated Local Upgrade Cost: **\$2,400,000**

\*The estimates are preliminary in nature, as they were determined without the benefit of detailed engineering studies. Final estimates will require an on-site review and coordination to determine final construction requirements. It will take approximately one year after obtaining the authorization to construct the facilities as outlined above.

### **Reactive Requirements**

PJM requires a power factor correction to 95% lead/lag at the point of interconnection for wind generating facilities. It is expected that AEPSC will adhere to this standard.

### **Network Impacts**

The Queue S71 project was studied as a 120 MW (24 MW of capacity) injection into the Bluff Point 138 kV substation in the AEP territory. Project S71 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

### **Generator Deliverability**

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

No Problems were identified.

### **Multiple Facility Contingency**

*(Double Circuit Tower Line contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)*

No Problems were identified

### **Short Circuit**

No problems identified on the transmission system.

### **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)**

None identified

### **New System Reinforcements**

*(Upgrades required to mitigate reliability criteria violations, i.e. “Network Impacts”, initially caused 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. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)*

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.

No problems were identified.