

#S67 Gould Street 110 MW  
**Generator Interconnection**

**This analysis was completed to assess the reliability impact for a new generator interconnecting to the PJM System as a Capacity Resource.**

### ***Network Impacts***

The Queue S67 project was studied as a 110 MW injection into the Gould Street 34.5 kV bus. The project was evaluated for compliance with transmission system reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

#### **Local Transmission System Impacts (Normal system conditions with all facilities in service)**

See Direct Connection requirements.

#### **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.

#### **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)*

1. Contribution of 5 MW further overloads the Conastone – Ottercreek 230 kV line from 115% to 116% of its emergency rating (632 MVA) for the **tower** outage of Conastone – Peachbottom 500 kV line ckt#1 and ckt#2.
2. Contribution of 8 MW further overloads the Graceton – Manor 230 kV line from 135% to 137% of its emergency rating (530.9 MVA) for the **tower** outage of Conastone – Peachbottom 500 kV line ckt#1 and ckt#2.

## **Short Circuit Analysis**

See Direct Connection requirements for BG&E underlying system (34.5 kV) impacts. There were no problems identified at 230 kV and above.

## **Stability Analysis**

Will be performed for the Impact Study.

## **New System Reinforcements**

*(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts", initially caused by the addition of this project generation)*

None required.

## **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)*

### **1. Conastone to Ottercreek 230 kV line overloaded – requires 730 MVA Circuit 2302**

#### **BGE Upgrade**

Reconductor from Gorsuch Mills to PA line - **\$750,000 ~ 3 yrs.**

#### **Existing:**

- Circuit 2302 is 1,590 kcm 45/7 ACSR from Conastone to Gorsuch Mills and 795 kcm 30/19 ACSR from Gorsuch Mills to the PA line.

#### **Assumptions:**

- Reconductor with 1,590 kcm ACSR from Gorsuch Mills to PA line to match capability of remainder of line.
- Length of this line section is 1.7 miles.
- Towers can be reinforced instead of replaced.
- Based on previous estimate by R.W.M. for PJM (B48) study on circuit 22008

**PPL upgrade** - The proposed upgrade will consist of reconductoring approximately 17.2 miles of 795 kcmil 30/19 ACSR, (current ratings 425/531 MVA Summer Normal/Emergency based on conductor temp @125 Deg C ) with new 795 kcmil 30/19 ACSS (new ratings 516/632 MVA Summer Normal/Emergency, conductor operating temperature of 160 deg C)

The cost does not include upgrade of any substation terminal equipment at Conastone 230kV Substation; BG&E must provide that. No terminal equipment upgrade is required at Otter Creek; it is built with 2000 amp rating. **The magnitude cost estimate to uprate is \$8.5 million.**

This upgrade will result in minimal change to the impedance of the line.

Existing  $Z = 0.0042 + j 0.0266$  pu

New  $Z = 0.0048 + j 0.02676$  pu

2. **Graceton to Manor 230 kV line overloaded 130% of ER 531MVA – requires 691 MVA Circuit 2303**

BGE Upgrade

Reconductor from Graceton to PA line - **\$700,000 ~ 3 yrs.**

Existing:

- Circuit 2303 is 795 kcm 30/19 ACSR @ 125 C.

Assumptions:

- Reconductor with 1,590 kcm ACSR from Graceton to PA line.
- Length of this line section is 1.4 miles.
- Towers can be reinforced instead of replaced.
- Based on previous estimate by R.W.M. for PJM (B48) study on circuit 22008, and Conastone to Ottercreek 2302 estimate (above)

PPL Upgrade

The estimated magnitude cost for this upgrade including substation terminal equipment **cost is \$31,000,000.**

Description of Work:

In order to provide additional capacity on the Graceton – Manor 230kV line, PPL EU is proposing to rebuild the existing single circuit 230kV line composing of 795 ACSR. This rebuild will require new custom embedded steel poles to accommodate the larger conductor size of the new conductor. The new line will be 1590 Kcmil ACSR conductors (1 per phase) designed and operated at 230 kV. The 230 kV lines will be rated for summer normal/emergency of 653/793 MVA respectively. These ratings are based on the conductor ratings and may be lower when the line is actually built. The rebuild will be 14.4 miles long and will travel the existing right of way.