**Generation 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 - 1000 MW Injection**

Network impacts for the injection of 1000 MW into the Cromby 230kV Substation or the Limerick 500kV Substation (Project #B25) were evaluated for 2004 summer peak conditions.

Injection of 1000 MW into the Cromby 230kV Substation or the Limerick 500kV Substation was evaluated for system normal conditions, single contingency outage conditions, and some multiple contingencies. **The analyses assumes that earlier projects, in the PJM Generator Interconnection queues, are already connected**. In addition, a limited breaker short circuit duty screening was also performed. Generator deliverability analysis, stability analysis, and the determination of cost allocation for network upgrade requirements are not performed within the scope of the feasibility study.

Based on the power flow analysis performed the following network impacts were identified:

## *Limerick 500 kV Option:*

Normal System

- Normal overload on the Conastone – Peach Bottom 500 kV circuit. The circuit is also overloaded for various single contingencies. This violation requires an upgrade of the Conastone – Peach Bottom 500 kV circuit (approx. 16.5 mi.) at an estimated cost of **$28,000,000**. This estimate is base on the cost to add a second 500 kV circuit and is dependent on the ability to obtain the necessary right-of-way. If it is determined that this circuit must be upgraded in the impact study, other alternatives will be investigated.

Single Contingency (MAAC Criteria IIA)

- Contingency overload on the TMI 500/230 kV transformer due to the outage of the Conastone – Peach Bottom 500 kV circuit. This violation requires the addition of a second TMI 500/230 kV transformer at an estimated cost of **$6,400,000**.

- Contingency overload on the Conastone 500/230 kV transformer due to the outage of the Conastone – Brighton 500 kV circuit. This violation requires the addition of a third Conastone 500/230 kV transformer at an estimated cost of **$20,000,000**.

- Contingency overload on the Nottingham – Graceton 230 kV circuit due to the outage of the Conastone – Peach Bottom 500 kV circuit. This violation requires rebuilding the Nottingham – Graceton 230 kV circuit at an estimated cost of **$30,000,000**.

- Contingency overload on the Buxmont – Whitpain 230 kV circuit due to the outage of the Conastone – Peach Bottom 500 kV circuit. This violation requires the reconductoring the Buxmont – Whitpain 230 kV circuit at an estimated cost of **$3,000,000**.

- Contingency overload on the Buckingham – Pleasant Valley 230 kV circuit due to the outage involving the Elroy – Whitpain 500 kV circuit. This problem requires re-building the Buckingham - Pleasant Valley 230 kV line at an estimated cost of **$14,500,000**.

## *Cromby 230 kV Option:*

**In addition** to the above overloads identified for the *Limerick 500 kV option*, the following violations occur when the project is connected at the Cromby 230 kV substation

- Contingency overload on the Limerick 500/230 kV transformers due to the outage of the Cromby - Barbadoes 230 kV circuit and contingency overload on the Cromby – Plymouth Meeting 230 kV circuit for the loss of the Limerick 500/230 kV transformers. These violations require the addition of two additional Limerick 500/230 kV transformers at an estimated cost of **$15,700,000**.

- Contingency overload on the Perkiomen – North Wales 230 kV circuit due to the outage involving the Jarrett – Whitpain 230 kV. This problem requires rebuilding the North Wales - Warrington 230 kV line and installing new conductor, at a cost estimate of **$12,000,000**.

- Contingency overload on the Barbadoes - Plymouth Meeting 230 kV circuit due to the outage involving the Cromby – Perkiomen 230 kV circuit. This problem may require replacing some of the terminal equipment of the Barbadoes – Plymouth Meeting 230 kV circuit at a cost estimate of **$1,000,000**.

Double Circuit Tower Circuit Outages (MAAC Criteria IIC)

- No identified problems

## Short Circuit Analysis

- At this point, no breakers appear to be directly attributable to the project if it connects to the 500 kV; seven circuit breakers at the Limerick 230 kV substation and five circuit breakers at the Plymouth Meeting 230 kV substation may have to be replaced at an estimated cost of **$5,000,000** if the project connects to the 230 kV.