



## RELIABILITY EVALUATION FOR THE POTENTIAL RETIREMENT OF BENNING GENERATION

### Background

At the request of the DC Commission, PJM studied the potential retirement of the total generation of 550 MW at Benning. The purpose of this system reliability evaluation is to identify any potential transmission system limitations in the area surrounding Benning that would violate PJM Reliability Planning Criteria.

### Applicable Reliability Principles and Standards

Under the PJM Operating Agreement, the Transmission Owners Agreement and the PJM Open Access Tariff, PJM is responsible for the reliability of the transmission system. The PJM Operating Agreement, Schedule 6, specifies that the regional transmission system shall conform to the applicable reliability principles, guides and standards of NERC and the applicable regional reliability council (MAAC, ECAR, MAIN or SERC).

Among the applicable reliability criteria that PJM applied in completing the reliability analysis for the Benning area are:

1. PJM Reliability Planning Criteria - Attachment G to PJM Manual 14B "Generation and Transmission Interconnection Planning".  
[www.pjm.com/contributions/pjm-manuals/pdf/m14bv04.pdf](http://www.pjm.com/contributions/pjm-manuals/pdf/m14bv04.pdf)
2. MAAC Reliability Principles and Standards  
[www.maac-rc.org/reference/princstandards.html](http://www.maac-rc.org/reference/princstandards.html)

### Results of the Reliability Evaluation for the Potential Retirement of Benning Generation

The PJM analysis for the potential retirement of the Benning generators is limited to identifying any potentially overloaded bulk power transmission lines (voltage levels of 230 kV and 500 kV). Lower voltage transmission impacts (voltage levels below 230 kV) were outside the scope of the current study.

The study revealed the following transmission system problems.

1. The Oak Grove – Ritchie – Benning 230 kV circuits were overloaded.
2. Numerous voltage criteria violations were identified on the PEPCO system that would require the installation of reactive compensation. These violations can likely be remedied through substation upgrades that would not have a long lead time for installation. Specific static and/or dynamic reactive compensation solutions were not identified for the current study.

The information provided herein was requested by the DC Commission to assist in completing a due diligence review for a potential retirement of the Benning generation. Analysis was performed by PJM as a result of that request, and is intended to be used solely for that purpose. This analysis does not represent any knowledge of or a determination by PJM with respect to the future status of the Benning generation.



3. A number of potential overloads due to line fault with stuck breaker contingencies were identified. These overloads can likely be remedied through various substation upgrades that would not have a long lead time for installation. Specific upgrades to mitigate these overloads were not identified for the current study.
4. Loading concerns due to increases of 3% and 5% were identified on five high voltage circuits and two 500/230 kV transformer facilities. These facilities serve an import function into the combined BG&E and PEPCO service territories and were heavily loaded prior to studying the potential retirement of the Benning generators. Resolving these concerns will need to be evaluated as part of a more comprehensive study for the Benning and surrounding areas. Specific network upgrades to resolve the loading concerns were not identified for the current study.

The affected facilities are:

- Doubs-Mt. Storm 500 kV Line
- Bedington-Black Oak 500 kV Line
- Conastone-Peach Bottom 500 kV Line
- Gracetown-Raphael 230 kV Line
- Conastone-Northwest 230 kV Line
- Three Mile Island (TMI) 500/230 kV transformer
- Doubs 500/230 kV transformer

One of the reliability tests performed by PJM is the load deliverability study which determines the adequacy of the transmission system to import power into defined regions of the PJM system. One of these regions is the combination of the Baltimore Gas & Electric (BG&E) and Potomac Electric Power Company (PEPCO) zones. In 2008, the available transmission margin is about 200 MWs more than the required import capability. The retirement of the Benning Road generation would result in insufficient import capability and several of the affected facilities listed above would be overloaded.