

**#069 – Beaver Creek-Hazard
Generation Interconnection**

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

AEP System Local Upgrades:

Station Work

New Bulan 138 kV Station: (Figures 3 and 8)

Construct a new 138/ 69kV station located at a site provided by EnviroPower. The new station will connect to the EnviroPower-Hazard 138 kV Line. Install a 138/69/12kV, autotransformer, 138kV, 2000A line and 1200A transformer motorized air break switches, 138 & 69kV bus work, three (3) 69kV, 2000A circuit breakers and associated line and bus disconnect switches, relaying and associated control cable, 138 & 69kV structural steel, foundation, grounding, site preparation, control building and associated equipment. Connect the Bonnyman and Hazard 69kV lines to the new 69 kV bus. The purchase of additional land will be necessary at this location.

Estimated Cost ¹ \$ 2,891,000

Line Work

New Bulan Station 69 kV Line Exits: (Figure 3)

On a new right-of-way (provided by EnviroPower), construct a single circuit wood H-Frame 69 kV line loop using 795 (45/7) kCM ACSR for phase conductor and 7#10 Alumoweld for ground wire – a distance of about 0.1 mile.

Estimated Cost ¹ \$ 1,898,000

Total Estimated System Upgrade Cost ¹ \$ 4,789,000

Total Estimated Project Cost ¹ \$51,036,000

¹ The estimates are preliminary in nature, as they were determined without detailed engineering and design studies. Estimated costs are based on 2003 service date.

Note: The Beaver Creek-Hazard Area Transmission System is planned for single contingency reliability. The Plant out let is also designed to withstand single contingency outages. Immediately subsequent to a single-contingency outage, the plant output would need to be curtailed to prepare for the next contingency. The curtailment would be required to mitigate both thermal and stability concerns. Actual level of curtailment would depend on final impedance values of the system and the generating unit and step-up transformer test data. If the developer proceeds with the project, AEP would conduct an operational study at cost to the developer to determine the curtailment amounts and specific conditions for which they would be required.

Network Impacts

The #O69 project was studied as a capacity injection of 535 MW into a tap of a new Beaver Creek to Hazard 138 kV circuit. Project #O69 was evaluated for compliance with reliability criteria for summer peak conditions in 2009. Potential network impacts were as follows:

Generator Deliverability

The Harrison-Pruntytown 500 kV line loads to 101% of its emergency rating (3502 MVA) for outage of the Ft. Martin-G30_W51 500 kV line. The #O69 project contributes approximately 49 MW to cause this condition.

Multiple Facility Contingency

No problems were identified

Short Circuit

No problems were identified

Contribution to Previously Identified Overloads

None

New System Reinforcements

The Harrison-Pruntytown 500kV line overload can be alleviated by construction of a second 500kV line between Fort Martin SS and the proposed North Longview SS and additions at Fort Martin and North Longview Switching Stations. See Figure #9

Second Fort Martin - North Longview 500kV line. Install a 1.5 mile 500kV line consisting of 8 structures between Fort Martin and North Longview. Assume R/W acquisition will be required. (This cost can be highly variable).

Estimated cost Line	\$2,150,000
Estimated cost R/W	\$ 500,000

Fort Martin Switching Station Extend the 2 main 500kV buses and install a new 500kV cross bus with 2 500kV breakers, 4 switches, 3 CVTs, 3 line arresters and a 500kV deadend structure.

Estimated cost	\$4,150,000
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North Longview Switching Station Install 3 500kV breakers, 6 switches, 2 bus CVTs, 500kV deadend structure, 3 line arresters and 3 line CVTs

Estimated cost	\$3,200,000
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Estimated costs are in 2009 dollars.

Contribution to Previously Identified System Reinforcements

None