

DISCUSSION OF [REDACTED] (“Customer”) GENERATION
FEASIBILITY STUDY RESULTS FOR THE PROPOSED GENERATING FACILITY NEAR THE
CITY OF HIGH POINT. TOTAL SUMMER PEAK OUTPUT IS EXPECTED TO BE 244 MW

REPORT DATE: June 18, 2008

Following are the results of the Generation Feasibility Study for the installation of 244 MW of generating capacity in Guilford County, NC. The site is located near Jackson Lake Substation, the switching station for Duke’s High Point City delivery 3, in proximity to both the Archdale 100 kV and Randleman 100 kV lines (Linden Street to Pleasant Garden). The plant consists of four units of 61 MW each, with Commercial Operation dates of June 1, 2011, June 1, 2013, June 1, 2015 and June 1, 2017. The study evaluated Network Resource Interconnection Service (NRIS).

A. Study Assumptions and Methodology

The power flow cases used in the study were developed from the Duke internal year 2017 summer peak case. The results of Duke's annual screening were used as a baseline to identify the impact of the new generation. All cases were modified to include 244 MW of additional generation. The generation addition was evaluated interconnected to the Archdale 100 kV line and to the Randleman 100 kV line. To determine the thermal impact on Duke’s transmission system, the new generation was modeled with a single-circuit, direct connection to the 100 kV High Point City delivery 3 that is served from the Archdale 100 kV lines. In studying the alternate connection, the new generation was modeled with a single circuit, direct connection to a new 100 kV bus and the Randleman 100 kV double circuit line was folded into the new bus approximately 3.75 miles from Linden Street Station. The economic generation dispatch was also changed by adding the new generation and forcing it on prior to the dispatch of the remaining Duke Balancing Authority Area units. The study cases were re-dispatched, solved and saved for use.

The NRIS thermal study uses the results of Duke Power Delivery's annual internal screening as a baseline to determine the impact of the new generation. The annual internal screening identifies violations of the Duke Power Transmission System Planning Guidelines and this information is used to develop the transmission asset expansion plan. The annual screening provides branch loading for postulated transmission line or transformer contingencies under various generation dispatches. The thermal study results following the inclusion of the new generation were obtained by the same methods, and are therefore comparable to the annual screening. The results are compared to identify significant impacts to the Duke transmission system.

Fault studies are performed by modeling the new generator and previously queued generation ahead of the new generator in the interconnection queue. Any significant changes in fault duty resulting from the new generator’s installation are identified. Various faults are placed on the system and their impact versus equipment rating is evaluated.

Reactive Capability is evaluated by modeling a facility’s generators and step-up transformers (GSUs) at various taps and system voltage conditions. The reactive capability of the facility can be affected by many factors including generator capability limits, excitation limits, and bus voltage limits. The evaluation determines whether sufficient reactive support will be available at the Connection Point.

B. Thermal Study Results

Archdale 100 kV Connection

No network upgrades were identified as being attributable to the studied generating facility.

Facility Name/Upgrade	Mileage	Estimated Cost	Lead Time (months)
Interconnection cost (new substation, assuming customer provides graded level pad)	n/a	\$3.0M	12
Interconnection cost (fold-in of Archdale lines to new substation)	0.5	\$1.1M	24
CUSTOMER TOTAL COST ESTIMATE		\$4.1M	

Randleman 100 kV Connection

The following network upgrades were identified as being attributable to the studied generating facility:

Facility Name/Upgrade	Existing Size/Type	Proposed Size/Type	Mileage	Estimated Cost	Lead Time (months)
1. Randleman kV (Linden Street Station to interconnection) upgrade (needed by 2017, prior to Commercial Operation of 4 th unit)	477 ACSR	B477 ACSR	3.76	\$3.5M	24
Interconnection cost (new substation, assuming customer provides graded level pad)			n/a	\$3.0M	12
Interconnection cost (fold-in of Randleman lines to new substation)			0.6	\$1.53M	24
CUSTOMER TOTAL COST ESTIMATE				\$8.03M	

C. Fault Duty Study Results

Archdale 100 kV Connection

The following breakers will need to be replaced:

1. At Pleasant Garden, PCB 26 (230 kV), the breaker connecting the Pleasant Garden White line to the red bus.

Total estimated cost for breaker replacements: \$250,000

Randleman 100 kV Connection

The following breakers will need to be replaced:

1. At Pleasant Garden, PCB 26 (230 kV), the breaker connecting the Pleasant Garden White line to the red bus.
2. At Greensboro Main, Capacitor Bank 2 Breaker (100 kV)

Total estimated cost for breaker replacements: \$450,000

D. Reactive Capability Study Results

With the proposed High Point 244 MW facility, the level of reactive support supplied by the units has been determined to be acceptable at this time. Evaluation of MVAR flow and voltages in the vicinity of both interconnection points indicates adequate reactive support exists in the region. Should future studies show the need for additional support, Duke Power integrated resource planning will evaluate solutions and make appropriate changes to the system.

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