

**PJM Generator Interconnection
Z1-036 Winfall-Chowan 230 kV
39 MW Capacity / 300.3 MW Energy
Feasibility Study Report**

*February 2014
DMS #782874v1*

Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, §36.2, as well as the Feasibility Study Agreement between Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Virginia Electric and Power Company.

Preface

The intent of this Feasibility Study is to determine a plan, with preliminary cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by IC. As a requirement for interconnection, IC may be responsible for the cost of constructing Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM and the underlying system. All facilities required for interconnection of a generation interconnection project must be designed to meet ITO technical specifications.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. IC is responsible for its right of way, real estate, and construction permit issues.

General

Queue project Z1-036 was studied as 300.3 MW energy with 39 MW as Capacity injection onto as a tap of the Winfall- Edenton 230 kV line in the ITO area. Project Z1-036 was evaluated for compliance with reliability criteria for summer peak conditions in 2017.

Costs

Attachment Facilities:	\$1.6 M
Direct Connection Network Upgrade:	\$6 M
Non-Direct Connection Network Upgrade:	None

Schedule

24-30 months

Network Impacts:

Impactful Contingencies

(The following contingencies resulted in overloads identified below)

None identified.

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None identified.

Multiple Facility Contingency

(Double Circuit Tower Line Contingencies only with full energy output. Stuck Breaker and Bus Fault contingencies will be applied during the Impact Study)

None identified.

Contribution to Previously Identified Overloads

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have % allocation of cost responsibility which will be calculated and reported for the Impact Study.)

None identified.

Short Circuit

(Report Overdutied breakers here)

There is no impact to breaker interrupting capabilities as a result of Z1-036.

Delivery of Energy Portion of Interconnection Request

(PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed, which will study all overload conditions associated with the overloaded element(s) identified.)

None identified.

Stability, Steady-State Voltage and Reactive Power Requirements

To be performed in subsequent study.

Light Load

To be performed in subsequent study.

ITO Analysis

ITO assessed the impact of the proposed queue project Z1-036 interconnection as 300.3 MW of energy (Capacity 39 MW) for compliance with reliability criteria on ITO transmission system. The system was assessed using the summer 2017 RTEP case provided to ITO by PJM. This analysis did include the impacts of the generation capability for all higher order queue generators within the ITO transmission system. When performing a generation analysis, ITO's main analysis is load flow study results under single contingency, both normal and stressed system conditions. The stressed system conditions and import/export analysis for Z1-036 will be performed during the System Impact Study. ITO criteria consider a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. A full listing of ITO's planning criteria and interconnection requirements can be found in the ITO's facility connection requirements which are publicly available at: <http://www.dom.com>.

Attachment Facilities:

Generation Substation: Install metering and associated Protection Equipment. Estimated Cost \$600,000.

Transmission Line: Construct approximately one span of 230 kV Attachment line between the generation substation and XXXX Switching Substation. The estimated cost for this work is \$1,000,000.

It is estimated to take 18-24 months to complete this work.

Direct Connection Network Upgrades:

Substation: Establish the new 230kV Switching Substation (interconnection substation). The arrangement in the substation will be as shown below on Dominion Attachment "A": One-Line Diagram. The estimated cost of this facility is \$6,000,000. It is estimated to take 24-36 months to complete this work.

Non-Direct Connection Network Upgrades:

None.

Appendix A: One-Line Diagram

