Merchant Transmission Project
Feasibility Study Report

For

PJM Generation Interconnection Request
Queue Position W1-078

Sammis-Wylie Ridge 345kV Line Project

PJM DOCS No. 618781v1
May, 2011

General:

The purpose of the feasibility study is to determine magnitude cost and the construction time estimates to connect the project at a location specified by the Interconnection Customer. As a requirement for interconnection, the project developer will be responsible for all direct connection as well as any network upgrade costs required for the connection of this project to maintain the reliability of the PJM system. All facilities installed by the project developer must be designed to meet the Allegheny Power technical specifications. Please note that Allegheny Power Systems had not become a part of FirstEnergy at the time this project entered the queue and various parts of this report were prepared. Therefore this report will make reference to "Allegheny Power Systems" and "APS" at various points. If this project proceeds to the next stages in the interconnection process, future reports and agreements will refer to this entity as Monongahela Power Company.

Project and Report Overview

The Interconnection Customer (IC), has proposed to upgrade the 345kV conductor between the Sammis substation in the FirstEnergy territory of MISO and the Wylie Ridge substation located in Allegheny Power System in PJM. Paralleling this division of facilities, this report is structured in a similar manner. The PJM Interconnection Planning Department performed an analysis to determine the impacts of this proposed upgrade on the PJM transmission system. Those results are presented first, followed then by the costs and schedules of the reinforcements required by Allegheny Power, then those of FirstEnergy in MISO.

PJM Transmission Analysis

Network Impacts

The queue W1-078 merchant transmission project was modeled as a new 345kV transmission line with termination points at the Sammis and Wylie Ridge substations. In order to see the effects of the project, a thermal analysis was performed with the project modeled, and again without the project modeled. The results were compared to see any potential impacts to the transmission system. Project W1-078 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. Potential network impacts were as follows:

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

No problems identified.

Multiple Facility Contingency
(Double Circuit Tower Line contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)

No problems identified.

Contribution to Previously Identified Overloads
(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

No problems identified.

New System Reinforcements
(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts", initially caused by the addition of this project generation)

None.

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

None.

Short Circuit

No short circuit impacts.

Allegheny Power System Reinforcements

A Feasibility Study has been prepared for PJM queue project W1-078 to upgrade the rating of the Sammis – Wylie Ridge 345kV line. The IC proposed operating the line in a six-wire configuration, utilizing the empty side of the existing double circuit structures. Final recommendation on the exact conductor recommendation and configuration will be defined at the Impact Study stage. The requested In-service date is June 2011.

The estimated costs associated with this work are as follows:

· Install approximately 3 miles (the AP line portion) of conductor on the empty side of the Sammis – Wylie Ridge 345kV line structures. Assume minor tower steel reinforcement is required.

Estimated Cost: $2,031,501 in 2011 dollars

· At Wylie Ridge SS, replace the Sammis 345kV line terminal trap with a 4000A trap, replace line risers, and upgrade the RTU MW. Replace the WK2 and WK3 345kV

breakers with 4000A units. Replace breaker foundations and control cables. Replace control panels as required.

Estimated Cost: $1,615,698 in 2011 dollars

The normal project duration for this work is 18 months, following the receipt of fully executed agreements. Therefore, the requested in-service date of June 2011 probably cannot be met due to equipment lead times and construction schedule constraints.

Note: The above scope and costs are limited to work on AP's facilities. Additional work must be performed by FirstEnergy on its facilities.

FirstEnergy Reinforcements

FirstEnergy has proposed the following for their potion of the line and associated facilities:

FE's suggested reinforcement estimated herein is based upon upgrading this line by adding new conductor(s) to open tower arms. FE will also need to reconductor the last 2 spans into Sammis appropriate conductor. Final determination of the exact conductor and configuration will be determined at the Impact Study stage.

The estimated costs associated with this work are as follows:

Estimated Cost: $2,010,500 in 2011 dollars

At Sammis Substation, replace the Sammis 345kV line terminal trap with a 4000A trap, replace line risers, and Replace the B295 and B298 345kV breakers with 4000A units. Replace disconnect switches D294, D296, D297, D299 with 4,000 A units. Estimate assumes new 345kV breakers will be dead tank, that existing 345kV structures and foundations are adequate, existing tuning unit and carrier relaying will be reused, new relays will be installed in existing panels, does not include any transmission line relocation work, cables for CT circuits will be replaced and control and power cables to the breakers will be reused.

Estimated Cost: $2,302,000 in 2011 dollars

The normal project duration for this work is 13 months, following the receipt of fully executed agreements. Therefore, the requested in-service date of June 2011 probably cannot be met due to equipment lead times and construction schedule constraints.

Summary

Based on a compilation of the above, the total cost for this project is $7,959,699 and the overall duration for construction is 18 months from execution of all agreements. The original Commercial Operation Date of June 2011 is not feasible so if the project goes forward, consideration of the time for the balance of the interconnection process and the construction schedules is essential.

SINGLE LINE DIAGRAM

