Generation Interconnection
Feasibility/System Impact Study Report

For

PJM Generation Interconnection Request Queue
Position AA1-013

Hanging Rock (Cornu) 765 kV

August 2015

Preface

The intent of the System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer 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 system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation will be deferred until the System Impact Study is performed.

The System Impact Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

General

Dynegy Marketing and Trade, LLC (Dynegy) proposes to increase the generation of its combined cycle plant at Hanging Rock 765 kV by 10 MWC (see Figure 1). Each combined cycle power block is currently assigned CIRs of 620 MWs, and thus, the two power blocks are assigned a total of 1240 MWs. Duke Energy described that the increases are the result of summer capacity testing of the existing GE Combined cycle power blocks, not due to any equipment changes. The summer capacity test result showed that each power block is capable of generating 625 MWs. Therefore the increase by 10 MWC will bring the total MFO of the two power blocks of the combined cycle plant to 1250 MW. The location of the generating facility of PJM Project AA1-013 is Ironton, OH (see Figure 2).

The requested in service date is June 1, 2015.

The objective of this Feasibility study is to determine budgetary cost estimates and approximate construction timelines for identified transmission facilities required to connect the proposed generating facilities to the AEP transmission system. These reinforcements include the Attachment Facilities, Local Upgrades, and Network Upgrades required to maintain the reliability of the AEP transmission system. Stability analysis is not included as part of this study.

Attachment Facilities

Station Cost:

- No work is required.

Protection and Relaying Cost:

- No work is required.

Local and Network Impacts

The impact of the proposed generating facility on the AEP Transmission System was assessed for adherence with applicable reliability criteria. AEP planning criteria require that the transmission system meet performance parameters prescribed in the AEP FERC Form 715[1] and Connection Requirements for AEP Transmission System[2]. Therefore, these criterion were used to assess the impact of the proposed facility on the AEP System. PJM project # AA1-013 was studied as a 10 MW increase at Hanging Rock 765 kV Substation consistent with the interconnection application. PJM Queue #AA1-013 project was evaluated for compliance with reliability criteria for summer peak conditions in 2018.

1 https://www.aep.com/about/codeofconduct/oasis/transmissionstudies/GuideLines/2014%20AEP%20PJM%20FERC%20715_Final_Part%204.pdf

2 https://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/Requirements/AEP_Interconnection_Requirements_rev1.pdf

Network Impacts

The Queue Project AA1-013 was studied as a 10.0 MW (Capacity 10.0 MW) injection at the Cornu 765 kV substation in the AEP area. Project AA1-013 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AA1-013 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Analysis - 2018

Generator Deliverability

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

None

Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

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)

None

Steady-State Voltage Requirements

(Results of the steady-state voltage studies should be inserted here)

None

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.

Not Applicable

Light Load Analysis - 2018

Not required

System Reinforcements

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)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

Short Circuit
(Summary form of Cost allocation for breakers will be inserted here if any)

None

Stability and Reactive Power Requirement
(Results of the dynamic studies should be inserted here)

Not required

Conclusion

Based upon the results of this Feasibility Study, the increase of 10 MW of generation at Hanging Rock 765 kV Substation (PJM Project #AA1-013) will not require additional Network upgrades.

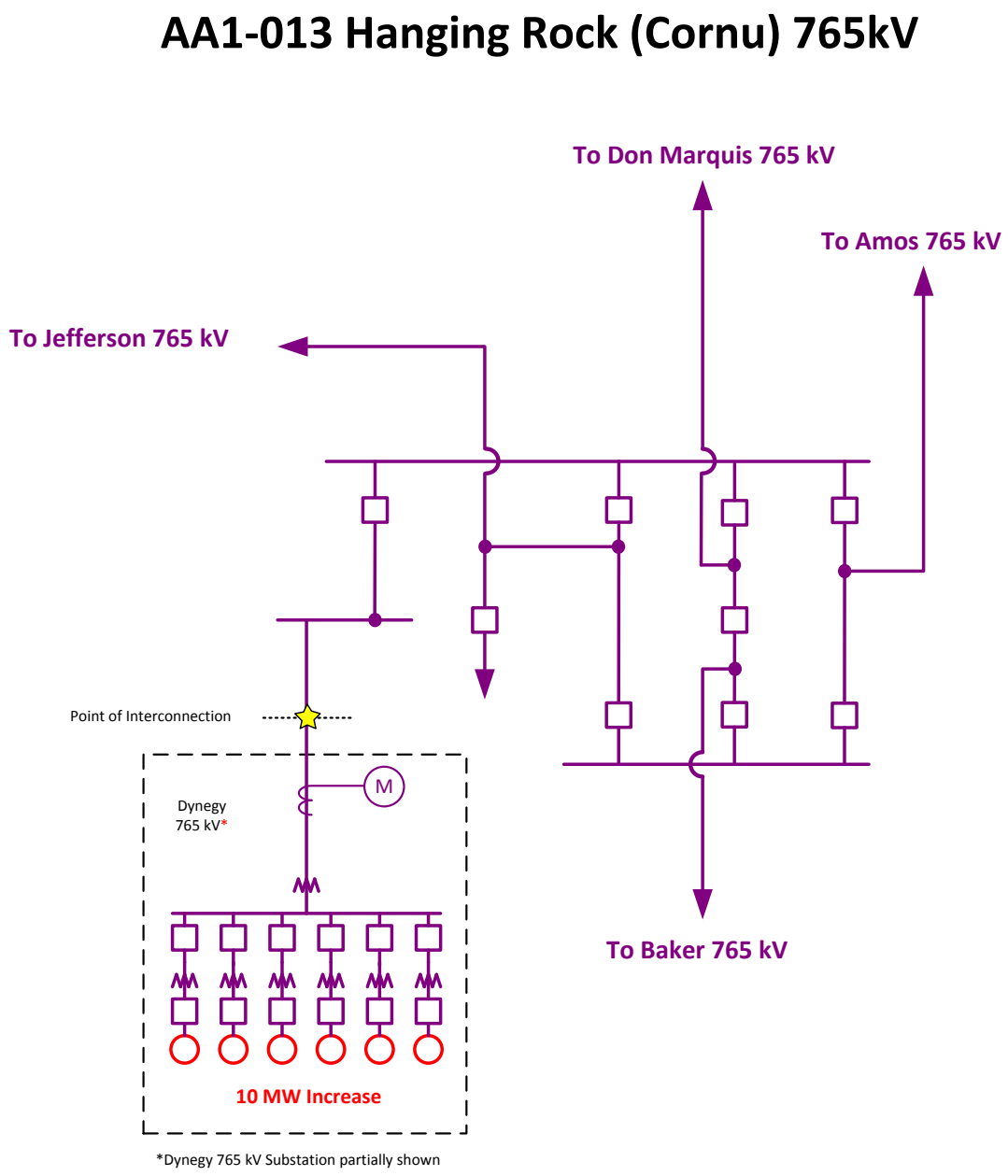

Figure 1 – Single Line Diagram

Figure 2: PJM Queue #AA1-013 Project Site

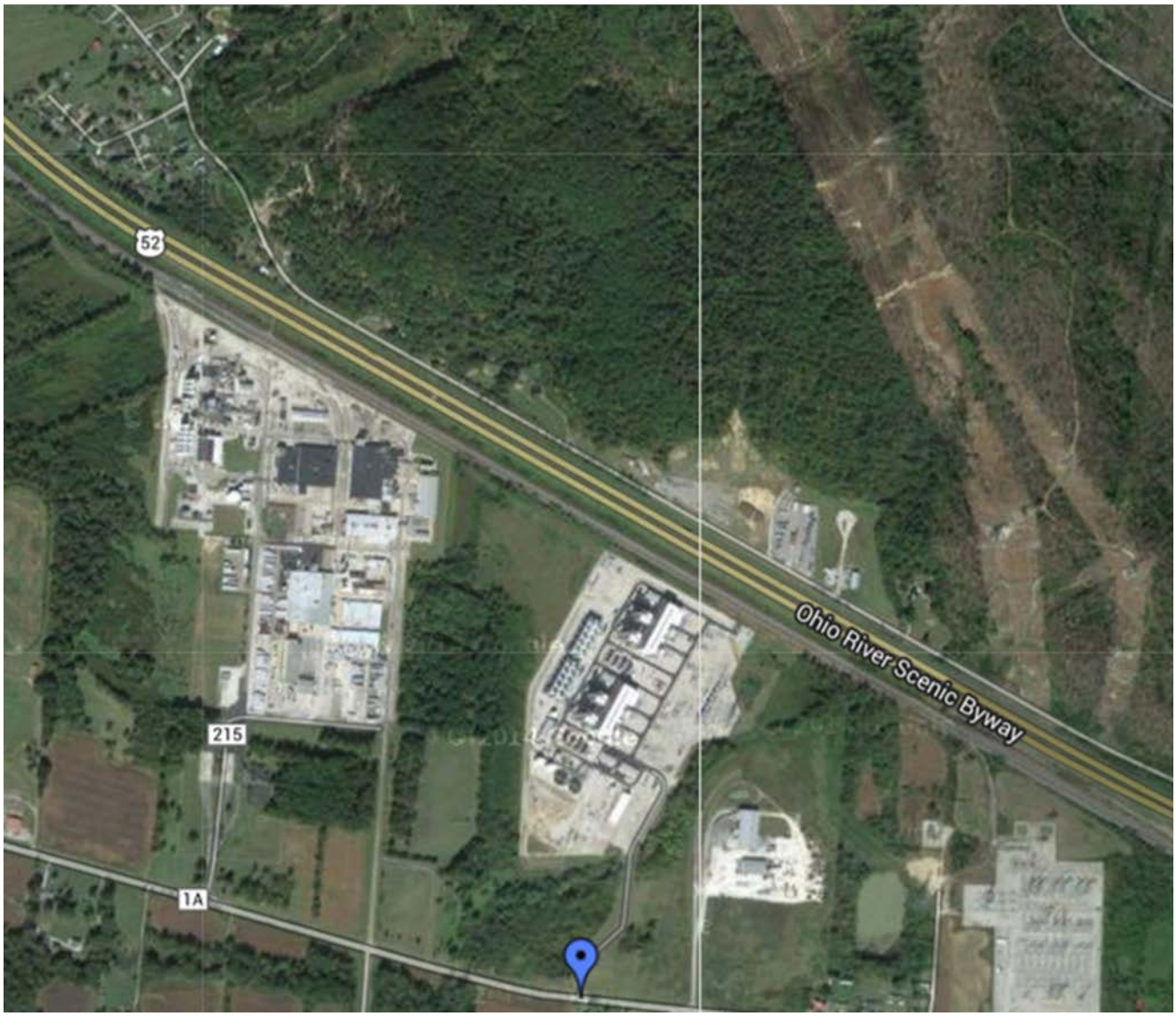

Figure 2: AA1-014 Point of Interconnection

Generation Interconnection
Feasibility/System Impact Study Report

For

PJM Generation Interconnection Request Queue
Position AA1-013

Hanging Rock (Cornu) 765 kV

February 2015

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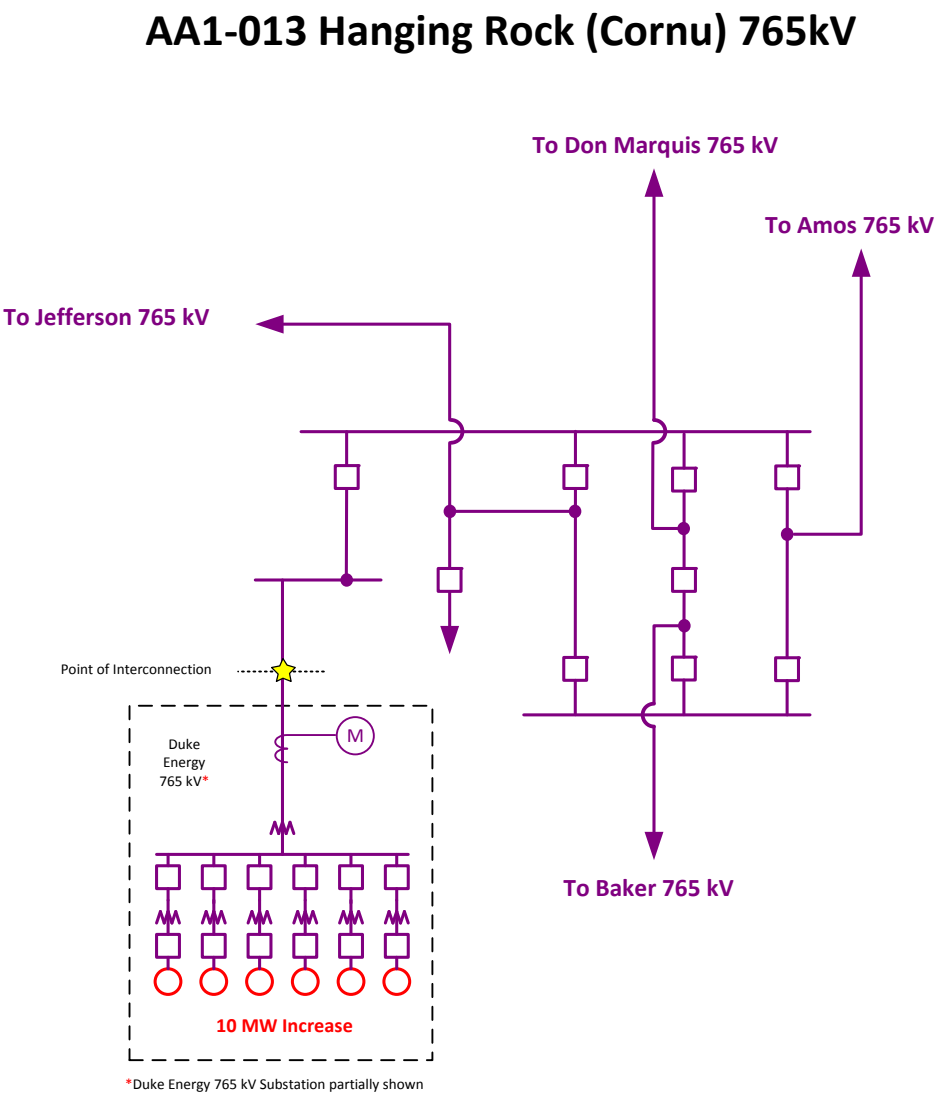

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Figure 2: AA1-014 Point of Interconnection