Generation Interconnection Feasibility Study Report

For

PJM Generation Interconnection Request Queue Position AB1-157

George Washington 138 kV

February 2016

Preface

The intent of the Feasibility Study is to determine a plan, with high level estimated cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer (IC). The IC may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the IC may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, 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 Impact Study is performed.

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. The IC is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by ITO, the costs may be included in the study.

General

The Interconnection Customer (IC) proposes to increase the generation of its generator by 10 MW. The following table lists attributes and status for the various queue positions associated with the project.

Project AB1-157 is evaluated as an injection of 10 MW (10 MW Capacity) at George Washington 138 kV substation.

The in-service date requested for this project is June 1, 2018.

The AB1 request will be studied on a 2019 base case year, which will provide rights based on this year. Interim deliverability studies will be needed to determine whether the increased plant capacity can be placed in service coincident with the previous queue requests.

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

No additional attachment facilities are required to accommodate the additional output associated with the AB1-157 request.

Local and Network Impacts

The Feasibility impact of the proposed 10 MW increase associated with AB1-157 queue 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 criteria were used to assess the impact of the proposed 10 MW increase on the AEP System. The IC's project AB1-157 was studied as an injection of 10 MW (10 MW Capacity) at George Washington 138 kV substation consistent with the interconnection application. Project #AB1-157 was evaluated for compliance with reliability criteria for summer peak conditions in 2019.

Potential network impacts were as follows:

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1 https://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/GuideLines/2015_AEP_PJM_FERC_715_Final_Part_4.pdf

2 http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/Requirements/AEP_Interconnection_Requirements_Rev1.pdf

Normal System (2019 Summer Conditions Capacity Output)

- No problems identified

Single Contingency (2019 Summer Conditions Capacity Output)

- No problems identified

Multiple Contingency (2019 Summer Conditions Capacity Output)

- No problems identified

Contribution to Previously Identified Overloads (2019 Summer Conditions Capacity Output)

- No problems identified

Normal System (2019 Summer Conditions Full Output)

- No problems identified

Single Contingency (2019 Summer Conditions Full Output)

- No problems identified

Multiple Contingency (2019 Summer Conditions Full Output)

- No problems identified

Contribution to Previously Identified Overloads (2019 Summer Conditions Energy Output)

#	Contingency Name	Contingency Description	Overload Facility Description	Limiting Element	Mitigation
1	'7642_C2_05KAMMR1 138-T'	CONTINGENCY '7642_C2_05KAMMR1 138-T' OPEN BRANCH FROM BUS 242937 TO BUS 243026 CKT 2 / 242937 05KAMMER 345 243026 05KAMMR1 138 2 OPEN BRANCH FROM BUS 243012 TO BUS 243026 CKT 1 / 243012 05G WASH 138 243026 05KAMMR1 138 1	The George Washington 138/69 kV transformer (from bus 243012 to bus 245935 ckt 2) loads from 100.59% to 101.89% (DC power flow) of its emergency rating (127 MVA) for the line fault with failed breaker contingency outage of '7642_C2_05KAMMR1 138-T'. This project contributes approximately 1.64 MW to the thermal violation.	Sub Cond 795 AAC 37 Str 69 kV Bus/Riser to CB/SW	
2	'5213_B2_TOR773'	CONTINGENCY '5213_B2_TOR773' OPEN BRANCH FROM BUS 243012 TO BUS 243026 CKT 1 / 243012 05G WASH 138 243026 05KAMMR1 138 1 END	The George Washington 138/69 kV transformer (from bus 243012 to bus 245935 ckt 2) loads from 100.58% to 101.88% (DC power flow) of its emergency rating (127 MVA) for the single line contingency outage of '5213_B2_TOR773'. This project contributes approximately 1.64 MW to the thermal violation.	Sub Cond 795 AAC 37 Str 69 kV Bus/Riser to CB/SW	
3	'5213_B2_TOR773'	CONTINGENCY '5213_B2_TOR773' OPEN BRANCH FROM BUS 243012 TO BUS 243026 CKT 1 / 243012 05G WASH 138 243026 05KAMMR1 138 1 END	BRUES (245920) 69.0 TO GLENDALE (245937) 69.0 loads from 101.47% to 103.37% (**DC power flow**) of its emergency rating (48 MVA) for the single line contingency outage of '5213_B2_TOR773'. This project contributes approximately 0.91 MW to the thermal violation.	COPPER ~ 3/0 ~ 7 ~ Conductor Section 1	
4	'5213_B2_TOR773'	CONTINGENCY '5213_B2_TOR773' OPEN BRANCH FROM BUS 243012 TO BUS 243026 CKT 1 / 243012 05G WASH 138 243026 05KAMMR1 138 1 END	The DILLES-SHADYSID 69 kV line (from bus 245086 to bus 245098 ckt 1) loads from 107.65% to 109.25% (**DC power flow**) of its emergency rating (46 MVA) for the single line contingency outage of '5213_B2_TOR773'.	COPPER ~ 3/0 ~ 7 ~ Conductor Section 1	

Short Circuit Analysis

- No problems identified

Stability Analysis

- To be determined during System Impact Study.

Voltage Variations

- No problems identified

Additional Limitations of Concern

- None

Local/Network Upgrades

- None
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Conclusion

Based upon the results of this Feasibility Study, the increase of 10 MW by PJM Project #AB1-157 will not trigger a need for additional network upgrades. PJM will determine in the System Impact Study the AB1-157 queue position share of any allocated network upgrade costs.