Generation Interconnection

Queue Project AE1-017

PEAK CREEK-DRAPER 34.5KV

Feasibility/System Impact Study Report

Capacity: 11 MW / Energy: 20 MW

June 2020

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer 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. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. 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 Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.An Interconnection Customer with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

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 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

The Interconnection Customer (IC), has proposed a Solar generating facility located in Pulaski, Virginia. The installed facilities will have a total capability of 20 MW with 11 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 1, 2020. This study does not imply a TO commitment to this in-service date.

Queue Number	AE1-017
Project Name	PEAK CREEK-DRAPER 34.5KV
State	Virginia
County	Pulaski
Transmission Owner	AEP
MFO	20
MWE	20
MWC	11
Fuel	Solar
Basecase Study Year	2022

Attachment facilities and local upgrades (if required) along with terms and conditions to interconnect AE1-017 will be specified in a separate two party Interconnection Agreement (IA) between AEP and the Interconnection Customer as this project is considered FERC non-jurisdictional per the PJM Open Access Transmission Tariff (OATT). From the transmission system perspective, no network impacts were identified in the Feasibility/Impact Study

Project Description

The Queue Project AE1-017 was evaluated as a 20 MW (Capacity 11 MW) injection at the Peak Creek 138 kV substation in the AEP area. Project AE1-017 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-017 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Load Flow

Generation 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

Potential Congestion due to Local Energy Deliverability

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.

Note: Only the most severely overloaded conditions are listed below. 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 shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
32223	934750	AD1-102 TAP	AEP	242609	05CLYTR2	AEP	1	AEP_P1-2_#311	operation	243.0	125.06	130.56	DC	13.36
32224	934750	AD1-102 TAP	AEP	242609	05CLYTR2	AEP	1	Base Case	operation	219.0	121.86	125.93	DC	8.91

Short Circuit

The following Breakers are overduty

None

Additional Interconnection Customer Responsibilities

The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.

Affected Systems

LG&E

None

MISO

None

TVA

None

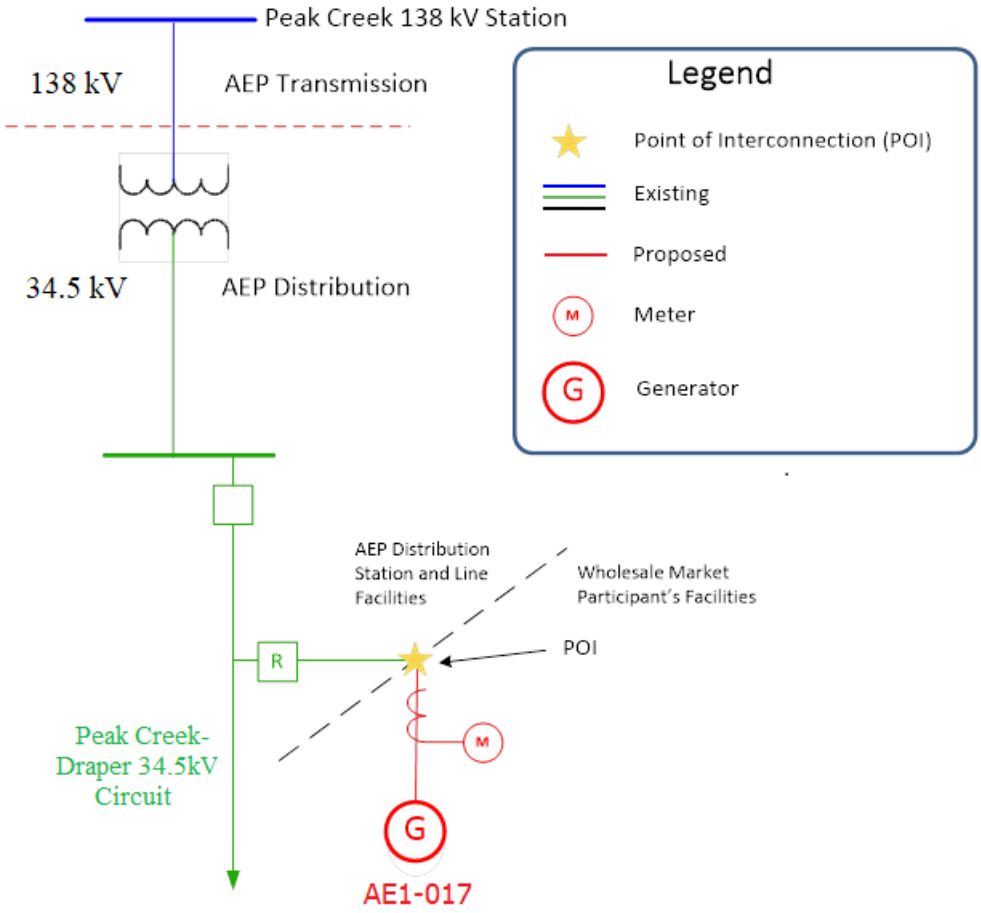
Duke Energy Progress

None

Contingency Descriptions

Contingency Name	Contingency Definition
Base Case	
AEP_P1-2_#311	CONTINGENCY 'AEP_P1-2_#311' OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 OPEN BRANCH FROM BUS 242684 TO BUS 242685 CKT ZB / 242684 05J.FERR 138 242685 05J.FERX 138 ZB END
AEP_P7-1_#10877	CONTINGENCY 'AEP_P7-1_#10877' OPEN BRANCH FROM BUS 242608 TO BUS 242791 CKT 1 / 242608 05CLYTR1 138 242791 05SCHRIS 138 1 OPEN BRANCH FROM BUS 242609 TO BUS 242634 CKT 1 / 242609 05CLYTR2 138 242634 05EDGEMO 138 1 OPEN BRANCH FROM BUS 242708 TO BUS 243874 CKT 1 / 242708 05M FUNK 138 243874 05TECHDR 138 1 OPEN BRANCH FROM BUS 242791 TO BUS 243874 CKT 1 / 242791 05SCHRIS 138 243874 05TECHDR 138 1 OPEN BRANCH FROM BUS 242791 TO BUS 244118 CKT 1 / 242791 05SCHRIS 138 244118 05SCHRISTB 69.0 1 OPEN BRANCH FROM BUS 244107 TO BUS 244118 CKT 1 / 244107 05CAMBRIA 69.0 244118 05SCHRISTB 69.0 1 END

Contingency Name	Contingency Definition
AEP_P4_#10191_05CLYTR3 138_C	CONTINGENCY 'AEP_P4_#10191_05CLYTR3 138_C' OPEN BRANCH FROM BUS 243969 TO BUS 242640 CKT 1 / 243969 05FLOYD EQ 999 242640 05FLOYD 138 1 OPEN BRANCH FROM BUS 243969 TO BUS 243967 CKT 1 / 243969 05FLOYD EQ 999 243967 05FLOYD 69.0 1 OPEN BRANCH FROM BUS 243969 TO BUS 243966 CKT 1 / 243969 05FLOYD EQ 999 243966 05FLOYD 34.5 1 OPEN BRANCH FROM BUS 242535 TO BUS 242610 CKT 1 / 242535 05ALUMRG 138 242610 05CLYTR3 138 1 OPEN BRANCH FROM BUS 242535 TO BUS 242640 CKT 1 / 242535 05ALUMRG 138 242640 05FLOYD 138 1 OPEN BRANCH FROM BUS 247869 TO BUS 242608 CKT 1 / 247869 05CLAYTR HY1 138 242608 05CLYTR1 138 1 OPEN BRANCH FROM BUS 242608 TO BUS 242610 CKT Z1 / 242608 05CLYTR1 138 242610 05CLYTR3 138 Z1 OPEN BRANCH FROM BUS 242608 TO BUS 242666 CKT 1 / 242608 05CLYTR1 138 242666 05HAZELH 138 1 OPEN BRANCH FROM BUS 242608 TO BUS 242791 CKT 1 / 242608 05CLYTR1 138 242791 05SCHRIS 138 1 OPEN BRANCH FROM BUS 242609 TO BUS 242610 CKT Z1 / 242609 05CLYTR2 138 242610 05CLYTR3 138 Z1 OPEN BRANCH FROM BUS 242640 TO BUS 242750 CKT 1 / 242640 05FLOYD 138 242750 05PHILPOTT Z 138 1 OPEN BRANCH FROM BUS 247723 TO BUS 242750 CKT 1 / 247723 05PHILPOTT 138 242750 05PHILPOTT Z 138 1 OPEN BRANCH FROM BUS 242750 TO BUS 242844 CKT 1 / 242750 05PHILPOTT Z 138 242844 05W.BASS 138 1 OPEN BRANCH FROM BUS 247869 TO BUS 242906 CKT 1 / 247869 05CLAYTR HY1 138 242906 05CLAY-1 11.0 1 REMOVE UNIT 1 FROM BUS 242906 / 242906 05CLAY-1 11.0 REMOVE UNIT 2 FROM BUS 242906 / 242906 05CLAY-1 11.0 END
AEP_P1-2_#10190	CONTINGENCY 'AEP_P1-2_#10190' OPEN BRANCH FROM BUS 243969 TO BUS 242640 CKT 1 / 243969 05FLOYD EQ 999 242640 05FLOYD 138 1 OPEN BRANCH FROM BUS 243969 TO BUS 243967 CKT 1 / 243969 05FLOYD EQ 999 243967 05FLOYD 69.0 1 OPEN BRANCH FROM BUS 243969 TO BUS 243966 CKT 1 / 243969 05FLOYD EQ 999 243966 05FLOYD 34.5 1 OPEN BRANCH FROM BUS 242535 TO BUS 242610 CKT 1 / 242535 05ALUMRG 138 242610 05CLYTR3 138 1 OPEN BRANCH FROM BUS 242535 TO BUS 242640 CKT 1 / 242535 05ALUMRG 138 242640 05FLOYD 138 1 OPEN BRANCH FROM BUS 242608 TO BUS 242610 CKT Z1 / 242608 05CLYTR1 138 242610 05CLYTR3 138 Z1 OPEN BRANCH FROM BUS 242609 TO BUS 242610 CKT Z1 / 242609 05CLYTR2 138 242610 05CLYTR3 138 Z1 OPEN BRANCH FROM BUS 242640 TO BUS 242750 CKT 1 / 242640 05FLOYD 138 242750 05PHILPOTT Z 138 1 OPEN BRANCH FROM BUS 247723 TO BUS 242750 CKT 1 / 247723 05PHILPOTT 138 242750 05PHILPOTT Z 138 1 OPEN BRANCH FROM BUS 242750 TO BUS 242844 CKT 1 / 242750 05PHILPOTT Z 138 242844 05W.BASS 138 1 END



The Point of Interconnection is at AEP's distribution primary meter facility on the Wholesale Market Participant's premise.

Figure 1 – Single Line Diagram