PJM Generator Interconnection
Z1-072 Crescent Ridge
Feasibility/System Impact Study

March 2014

DMS # 783781v1

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.

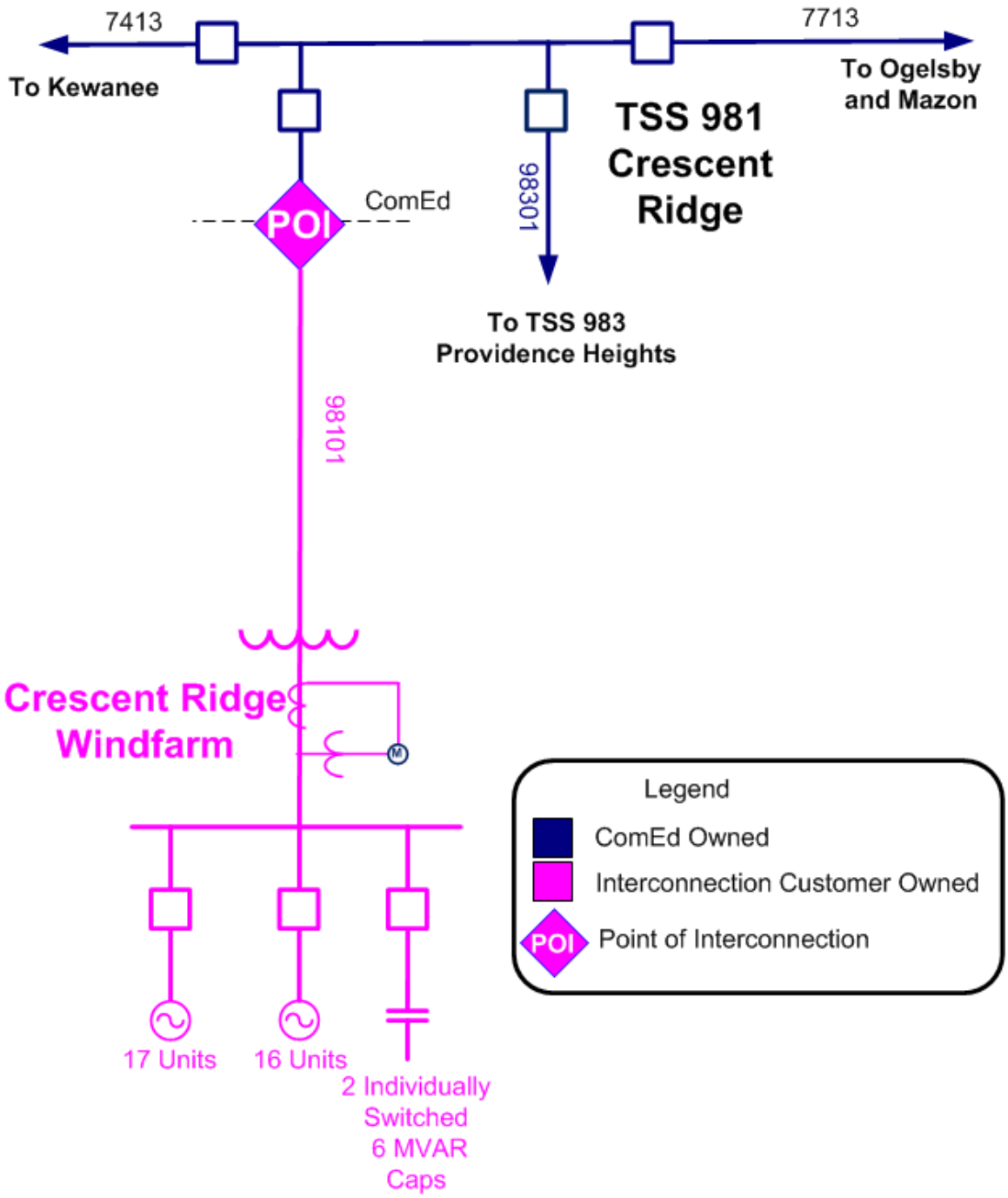
The System Impact Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently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

General

Queue Z1-072 Crescent Ridge is a Crescent Ridge LLC ("Interconnection Customer") request to receive 10MW of Capacity Interconnection Rights ("CIRs") for their existing energy only windfarm. The Customer Facility is located in Tiskilwas, IL.

Direct Connection Requirements

Queue Z1-072 is connected to Commonwealth Edison's TSS 981 Crescent Ridge Substation as shown on the single line diagram below.



Interconnection Customer Scope of Direct Connection Work

None.

Transmission Owner (Com Ed) Scope of Direct Connection Work

None.

Network Impacts

The queue Z1-072 project was studied as a 10.0MW capacity injection into ComEd's system at the TSS 981 Crescent Ridge 138kV substation. Project Z1-072 was evaluated for compliance with reliability criteria for summer peak conditions in 2017. Potential network impacts were as follows:

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

No issues identified.

Light Load Analysis

Not required for this existing facility.

Multiple Facility Contingency
(Double Circuit Tower Line, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

Not required for this existing facility.

Steady-State Voltage Requirements

Not required for this existing facility.

Stability and Reactive Power Requirement

Not required for this existing facility.

Short Circuit

Not required for this existing facility.

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)

1. (CE - MISO AMIL) The Hennepin Tap-Hennepin Sub 138 kV line (from bus 271655 to bus 348918 ckt 1) loads from 154.79% to 156.57% (AC power flow) of its emergency

rating (160 MVA) for the single line contingency outage of '138-L7713A_R-S'. This project contributes approximately 3.09 MW to the thermal violation.

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CONTINGENCY '138-L7713A_R-S'                    /MODIFIED BY S. THIEL 11/21/13
 TRIP BRANCH FROM BUS 271655 TO BUS 272189 CKT 1        / HENNE; T 138 OGLES; T 138
 TRIP BRANCH FROM BUS 272189 TO BUS 271987 CKT 1        / OGLES; T 138 MAZON; R 138
 TRIP BRANCH FROM BUS 272189 TO BUS 348935 CKT 1        / OGLES; T 138 4OGLESBY MN 138
 END
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Please refer to Appendix 1 for a table containing the generators having contribution to this flowgate.

Contribution to Previously Identified System Reinforcements

1. (CE - MISO AMIL) The Hennepin Tap-Hennepin Sub 138 kV line:
The limiting element on this line is owned by Ameren Illinois; this violation will be further evaluated in the Facilities Study phase.

Delivery of Energy Portion of Interconnection Request

Not Applicable

Appendices

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.

It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

Appendix 1

(CE - MISO AMIL) The HENNE; T-4HENNEPIN S 138 kV line (from bus 271655 to bus 348918 ckt 1) loads from 154.79% to 156.57% (AC power flow) of its emergency rating (160 MVA) for the single line contingency outage of '138-L7713A_R-S'. This project contributes approximately 3.09 MW to the thermal violation.

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 END
```

Bus Number	Bus Name	Full Contribution
274877	BSHIL; 1U	0.08
274878	BSHIL; 2U	0.08
274848	CAMPG;RU	0.1
274851	PROVI;RU	0.17
290089	Q-039 C	3.04
886211	T-143 C1	13.21
886221	T-143 C2	13.21
891131	U4-027	8.13
916271	Z1-072	3.09