

**Feasibility Study Report
PID-273
19.9 MW
Oak Grove-Galion 115kV Tap
Transmission Interconnection**

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DISCLAIMER

This study has been prepared without the benefit of detailed engineering or study data. The solution set reflects the current understanding of the proposed project. **This study is intended to be used as a screening tool by the Customer.** There are many variables which are unknown at this time. These variables could significantly change the scope of work and estimated cost. In order to proceed with the project, a System Impact Study and Facility Study will need to be developed.

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I. Introduction

The following Feasibility Study is based on the request for interconnection of Entergy's transmission system between Oak Grove and Galion substations by PID-273. The objective of this study is to assess the impact of the new facility on the Entergy transmission system by identifying:

- Any system protection equipment short circuit capacity limits exceeded
- Thermal overload, frequency, or voltage limitations

The study is intended to determine whether the transmission system Planning Criteria is met when the facility is connected to Entergy's system. If not, appropriate system improvements will be identified.

The Feasibility Study process required a load flow analysis to determine if the existing transmission lines are adequate to handle the full output from the proposed generation facility. A short circuit analysis is performed to determine if the generation would cause the available fault current to exceed the fault duty of existing equipment within the Entergy transmission system.

This study was based on information provided by PID-273 and assumptions made by Entergy's Transmission Planning group. If the actual equipment installed is different from the supplied information or the assumptions made, the results outlined in this report are subject to change.

III. Transmission System Analysis

1. SHORT CIRCUIT ANALYSIS/BREAKER RATING ANALYSIS

A. MODEL INFORMATION

The short circuit analysis was performed on the Entergy system using ASPEN software. This model includes all generators interconnected to the Entergy system or interconnected to an adjacent system and having an impact on this interconnection request, IPP's with signed IOAs, and approved future transmission projects on the Entergy transmission system. Proposed generators were, conservatively, modeled at a new 115kV bus 3.5 miles from Oak Grove 115kV substation.

B. ANALYSIS RESULTS

The evaluation projected an increase of less than 125 Amps at the PID-273 115kV bus. The present interrupting duty of the breaker installed at Oak Grove 115kV has adequate margin to accommodate the projected increase in short circuit current.

C. PROBLEM RESOLUTION

There were no problems identified for this part of the study that were a result of the additional PID-273 generation.

2. LOAD FLOW ANALYSIS

A. MODEL INFORMATION

The load flow analysis was performed based on the projected 2013 summer peak load flow model using PSSTME 30.3 and PSSTMMUST 9.0. The loads were scaled based on the forecasted loads for the year. All firm power transactions between Entergy and its neighboring control areas were modeled for the year 2013 excluding short-term transactions on the same transmission interface. An economic dispatch was carried out on Entergy generating units after the scaling of load and modeling of transactions. The proposed 19.9MW PID-273 generation was then modeled in the case to build a revised case for the load flow analysis

B. LOAD FLOW ANALYSIS

Single contingency analyses on Entergy's transmission facilities (including tie lines) 100kV and above were considered. All transmission facilities on the Entergy transmission system above 100kV were monitored.

C. PROBLEM RESOLUTION

There were no problems identified for this part of the study that were the result of PID-273 generators.

The load flow results are for information only. This interconnection does not in and of itself convey any transmission service.

3. Facilities at Point of Interconnection

The Interconnection Customer's designated Point of Interconnection (POI) is a new 115 kV substation that will be constructed and cut-in on Entergy's Galion-to-Oak Grove 115 kV transmission line. The interconnection customer is responsible for constructing all facilities needed to deliver generation to the POI.

The estimated cost for a 115 kV, 3 element ring bus configuration substation is \$6.7 Million. This cost is based on parametric estimating techniques for a "typical" site. Cost may significantly change based on specific project parameters that are not known at this time. Costs specific to this interconnection will be developed during the Facility Study.

Cost for the 115 kV transmission line connecting the generator to the new substation are not included in the substation estimate. The interconnection customer is responsible for constructing all facilities needed to deliver generation to the POI. The interconnection customer is responsible for identifying these costs.