#Q08 – Red Oak 230kV 50 MW - Revised
Generation Interconnection

This analysis was completed to assess the reliability impact for a new generator interconnecting to the PJM system as a capacity resource.

Network Impacts

The #Q08 project was studied as 2 options. Option 1 considers the injection of 50 MW into Red Oak 230 kV substation. The two existing Red Oak 230 kV buses were combined into a single, five-breaker ring bus. Option 2 considers the injection of 43 MW into a tap of the Red Oak-Raritan River T1034 230 kV circuit. Project #Q08 was evaluated for compliance with reliability criteria for summer peak conditions in 2011. Potential network impacts were as follows:

The analysis included representation of the Parlin generating facility, as required by Tariff, for those generating facilities that have been retired.

Generator Deliverability

Option A:

1. The Raritan River-Red Oak (Q08-Option 2 T1034) 230 kV line is overloaded at 103% of its emergency rating (739 MVA) for the outage of the Raritan River-Red Oak (G1047) 230 kV line. The Q08 project contributes 30 MW to the contingency facility loading.

Option B:

No problem identified.

Multiple Facility Contingency

No problem identified.

Short Circuit

Option A

Since the generator parameters did not change, there is no need for an evaluation and, therefore, there are no breakers overdutied.

Option B

No problems were identified.

Local Network Concerns

Option A &B

There is the potential for 34.5 kV constraints near Werner that may be attributable to the Q08 project. These occur due to the stronger Red Oak generation source that circulates flow down the Werner 115/34.5 kV transformers from the north versus flowing from the Atlantic/Red Bank area in the south as today. However, there are reliability improvements being considered at and near Werner that, if implemented, are expected to resolve the constraints that have been identified. While such plans are not firm, an assumption of the Feasibility Study performed is

that these improvements will be implemented. As a disclaimer, FirstEnergy reserves the right to revisit the need for 34.5 kV network upgrades as a part of the Impact Study.

Contribution to Previously Identified Overloads

None

New System Reinforcements

Reconductor the Raritan River - Red Oak Q08opt2 (T1034 - 2.6 mile) 230 kV line with 1590 ACSS conductor for 200 degrees centigrade operation. The upgraded normal/4-hour rating is expected to be 946/1093 MVA. The estimated cost of this upgrade is **$2,000,000**.

Contribution to Previously Identified System Reinforcements

None