#Q03 – Olive-Dequine 345kV 250 MW

Generation Interconnection

This analysis was completed to assess the reliability impact for a new generator interconnecting to the PJM system as a 250 MW energy resource and a 50MW capacity resource.

Network Impacts

The #Q03 project was studied as a 250 MW (50 MW of Capacity) injection at two distinct points of the AEP system. Option #1 studies the interconnection request at a tap of the Olive-Duquine 345 kV line, while option #2 considers the injection into the Duquine 345 kV substation. Project #Q03 was evaluated for compliance with reliability criteria for summer peak conditions in 2011. Potential network impacts were as follows:

1. Option #1: Tapping into the Olive-Duquine 345 kV circuit:

Generator Deliverability (This evaluation is done at the Capacity value)
No problems were identified

Multiple Facility Contingency (This evaluation is done at the Full plant output)
No problems were identified

Short Circuit
No problems identified.

Contribution to Previously Identified Overloads

A contribution of 25 Mw further overloads the 765/500 kV Kammer transformer increasing the loading from 102% to 103% of its emergency rating (2094 MVA) for the Beverly-Tidd and Kammer-W. Bellair-Tidd 345 kV tower line outage.

New System Reinforcements
None

Contribution to Previously Identified System Reinforcements

None

System Upgrades

The overload of the Kammer transformer can be alleviated by replacing the existing 1500 MVA transformer with three single phase units rated at 600 MVA each and a 600 MVA spare and replacing other substation equipment as required. (Upgrade # n0480) The estimated cost for the replacement is **$ 18,000,000.** The estimated lead time for replacement is 24 months. The Q03 project will be allocated costs for this upgrade initially caused by the Q01 project.

Potential Issues

Impacts on the MISO member transmission systems are not included in this feasibility analysis, but they will be included in the Impact Study, and may reveal upgrades are required in the MISO system.

Delivery of Energy Portion of interconnection Request

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, but are not reliability criteria violations. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

As a result of the aggregate energy resources in the area, the following violations were identified:

1. The Olive-Q01 345 kV line loads from 87% to 102% of its emergency rating (971 MVA) for the outage of the Olive-Reynolds-Dequine 345 kV circuit. The Q03 project contributes 148 MW to cause this overload.

Evaluation by AEP indicates overloads on the Q01-Olive circuit due to other contingency conditions. Those are listed below

Limit	Rating (MVA) N=Normal E=Emergency	Loading (%)	Contingency
Q01 - Olive 345 kV	971N	101	Dequine- Reynolds- Olive 345 kV
	971E*	104	Dequine- Reynolds- Olive 345 kV & Dequine-Westwood 345 kV #1 or #2
		101	Rockport-Jefferson 765 kV & Jefferson-Greentown 765 kV
		100	Rockport-Jefferson 765 kV & Jefferson-Clifty 765/345 kV

*Line emergency rating limited to conductor normal rating. A clearance study is required to determine if operation at higher conductor temperatures can be accommodated. This study would be performed as part of a Facility Study. The clearance study portion of the Facility Study cost is estimated to be **$350,000** and would require approximately 20 weeks from initiation.

2. Option #2: Into the Duquine 345 kV substation:

Generator Deliverability (This evaluation is done at the Capacity value)

No problems were identified

Multiple Facility Contingency (This evaluation is done at the Full plant output)
No problems were identified

Short Circuit
No problems identified

Contribution to Previously Identified Overloads

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New System Reinforcements

None

Contribution to Previously Identified System Reinforcements

None

System Upgrades

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Potential Issues

Impacts on the MISO member transmission systems are not included in this feasibility analysis, but they will be included in the Impact Study, and may reveal upgrades are required in the MISO system.

Delivery of Energy Portion of interconnection Request

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As a result of the aggregate energy resources in the area, the following violations were identified:

No problems were identified