#T54 Cumberland 9.4 MW

# Generator 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*

Queue T54 was studied as a 9.4 MW Capacity injection at Cumberland. Project T54 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Network impacts were as follows:

Generator Deliverability

1. The #2 Sherman 138/69 kV transformer will be loaded to 100.2% of emergency rating (89 MVA) for the outage of the #1 Sherman 138/69 kV transformer. The T54 project contributes 1.1 MW to cause the thermal violation.

**Multiple Facility Contingency**

No problems were identified

**Short Circuit**

Not applicable, there is no change to generator and transformer impedance.

**Stability Analysis**

Not required, there are no changes to generator characteristics

**Power Factor Analysis**

**Preliminary results indicate that T54 can meet the PJM Tariff 0.90 lag power (at the generator terminals) factor requirement based on manufacturer's design data.**

Queue T54 generator interconnection design must be capable of either;

- A power factor of 0.95 lead to 0.90 lag (at the generator terminals) at the new MW value, or
- A MVAR capability equal to the original MVAR capability (grandfathered lead and lag MVAR capability before the MW increase, or 0.95 lead to 0.90 lag for the original MWs whichever is less) plus a power factor of 1.0 to 0.90 lag for T54 MW increase, all measured at the generator terminals.

T54 design capability ("D" curves or other documentation) information was not provided by the Interconnection Customer in sufficient time to include a Power Factor analysis in this Feasibility Study. **Power Factor requirements will be further evaluated for the Impact Study.**

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**Contribution to Previously Identified Overloads**
No problems were identified

**New System Reinforcements**

1. The 0.2% contingency overload of Sherman 138/69 kV transformer #2 may possibly be mitigated by the installation of additional transformer cooling (fans and pumps). If this is not possible, it may be required to replace the #2 Sherman 138/69 kV transformer with a 100 MVA unit. The cost of the upgrade is **minimal if additional cooling is a viable solution, otherwise it may be $3,800,00 for a transformer replacement** which will take **36 months** to complete.

**Contribution to Previously Identified System Reinforcements**
None identified.

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