

# **Engineering Studies for Interconnection Process**

## **(< 100 kV)**

### **Southern Illinois Power Cooperative**

The process for evaluating new generation interconnections to the SIPC distribution (< 15 kV) system or the SIPC transmission (34.5 kV or 69 kV) system begins with the completion of an interconnection application. The process shall then consist of performing the following studies: Feasibility Study, Impact Study, and an optional Facility Study.

The Feasibility Study is a screening process that shall be completed to determine the impact of the new generation. Depending on the size and type of generation, interconnection voltage level, load of the distribution and transmission system, and location of the interconnection, a determination will be made of which engineering studies will be required for the Impact Study. The engineering studies shall include, but are not limited to, the following:

- Power Flow – Determine if the SIPC system will experience voltage or line loading issues under normal and contingency conditions. This will include a review for reverse power flow impacts of the proposed generation.
- Short Circuit Analysis – The SIPC system will be studied to determine that the proposed generation will not cause overstressing of any equipment and system faults will be properly cleared.
- Stability Analysis – The SIPC system will be studied to determine that the proposed generation will not cause system instability issues.
- Voltage Flicker Analysis – Determine if the proposed generator will cause unacceptable voltage swings. Review the impacts of capacitor and voltage regulation device switching.
- Protection Coordination – Review impact of coordination between the proposed generation and the existing system. Evaluate fault clearing times and determine if existing protection settings will need to be modified.
- Risk of Islanding – Determine if the proposed generation could function as an unintentional island.

The cost of preparing the Feasibility Study and the Impact Study could range from \$2k to \$30k for distribution system studies and upwards of \$50k for transmission system studies. These costs are determined on an individual basis, and are based on generator size and type, interconnection voltage level, location, and defined scope of work and schedule. An Impact Study scope of work and cost estimate will be provided to the applicant, and payment will be required prior to the initiation of further engineering studies. The application fee will be applied towards these studies and interconnection equipment. If actual costs are less than estimated, then the customer will receive a refund for the difference. Additionally, if actual costs are greater than estimated, the interconnection customer will be required to make an additional payment to cover the total costs.

If requested by the applicant, the preparation of a detailed Facility Study will determine a more accurate cost estimate for the required improvements. While the Impact Study identifies system impacts and planning level interconnection costs, the Facility Study will determine the equipment specifications and the detailed cost associated with installing the required equipment. A minimum fee of \$10k will be required by the applicant to initiate the detailed Facility Study, which will include SIPC and consultant efforts. As explained above, the applicant will be responsible for actual study costs.

The cost estimates referenced above include the cost of work performed by the SIPC planning staff and any other participants, including consultants and distribution system staff, involved in the coordinated study efforts.