

# **Engineering Studies for Distribution System Interconnection Process**

## **Southern Illinois Power Cooperative**

The process for evaluating new generation interconnection to the SIPC distribution system shall consist of a two-step process. The interconnection applicant shall first request a feasibility study to determine the magnitude of problems that may occur due to the new generation being added to the distribution system. The second phase of the interconnection process shall include the preparation of a facility study, which will determine the mitigation required to interconnect the new generation system as well as a cost estimate of facility that require upgrading.

For this initial phase for the Feasibility Study, a screening process shall be utilized to determine the types of engineering studies that shall be completed to determine the impact of the new generation. Depending on the size of the generation, load of the distribution system, and location of the interconnection, a determination will be made of which engineering studies will be required for the Feasibility Study. Phase 1 studies shall include the following:

- 1.) Power Flow and Voltage Drop – Determine if the SIPC distribution system will be overloaded under normal and contingency conditions. Review potential islanding of the proposed generation.
- 2.) 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.
- 3.) Flicker Analysis – Determine if generator load conditions will cause voltage swings when adding and reducing load. Evaluate the impact of the proposed generator to the existing generator regulation controls. Review impact of capacitor switching impact on the proposed generator.
- 4.) Protection Coordination – Review impact of coordination between proposed generation and the existing distribution system. Evaluate re-closing issues to ensure that the fault will clear prior to re-energizing the feeder circuit. Furthermore, determine if existing settings will need to be modified and review any protection issues caused by the step-up transformer.

For generators below 250 kW, we would expect that many of these studies would not be required and that the cost of preparing a Feasibility Study would be approximately \$8,000. For studies greater than 250 kW, the estimated cost for the Feasibility Study is \$15,000. In both cases, if the actual cost of the study is less than estimated, then the customer will receive a refund for the difference. Additionally, if the cost of the study is greater than estimated, the interconnection customer will be required to make an additional payment to cover the total cost of the study.

The Facility Study shall be completed if the interconnection customer decides to continue the interconnection process. This phase of the study shall determine the cost of providing new facilities and/or upgrading existing facility to mitigate overstressed system components as determined from the Feasibility Study. While the Feasibility Study identifies system impacts, the Facility Study will determine the optimal solution for mitigating overstressed distribution system facilities. The estimated cost to perform the Facility Study is \$10,000. As explained above, the interconnection customer shall pay for the actual cost of the study.

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.