



Undergraduate Researcher: Katrina Mansfield
Advisor: Dr. Karen Butler-Purry
Mentor: Matthew Marotti

Power Systems Automation Lab
Electrical Engineering Department
Texas A&M University

Title: The Effects of Generators on Short Circuit Conditions on a Power Distribution System

Abstract

OVERVIEW: Electricity is a necessity for residential, commercial, and industrial customers, and utility companies are constantly searching for more efficient ways to distribute electricity at a reasonable cost. Customers and utility companies have started to place distributed generators along the power system to supply the large amounts of power needed to serve the growing power demand. As a result utility companies have had to study and determine the effects of the distributed generators placed along the feeder to ensure efficiency and safety.

STUDENT PROJECT: To ensure the safety of their customers, a fault detection system, consisting of circuit breakers and fuses, is placed strategically throughout the distribution system. Radial feeders are typically used in distribution systems. Therefore, over-current protection schemes are used, and the settings for the protection devices are determined assuming a unidirectional flow, from the source to the load. The distributed generators placed along the feeder may cause current to have a bi-directional flow. As a result the utility companies must modify the protection system, which is the focus of our research. The overall objective is to create a fault detection system that will be effective in fault and normal conditions. One of the first steps and the objective for this summer was to determine the actual effects of the distributed generators placed along the distribution system using PSS/Adept software.