Francisco J. Verdeja Pérez

Faculty Mentor: Dr. Karen L. Butler-Purry
Co-Mentor: Suchismita S. Duttagupta

Department of Electrical Engineering
Texas A&M University

ABSTRACT

Load Flow Modeling and Analysis: IEEE 34 Node Distribution Feeders with and without Distributed Generation Resources (DG).

Understand the basic Power Distribution Systems and Load Flow techniques are essential for the interpretation of the IEEE 34 Node Test Feeder and its components. Modeling the different components of a Distribution Feeder on PSS/ADEPT Software will led us analyze changes in Load Flow that may occur on addition of DG at different locations. The line/cable segments, conductor spacing and shunt capacitors are complex components on the Feeder that depend of many specifications to be modeled correctly. The line/cable segments were divided on five different line configurations each one with its own length, phase, impedance and acceptance. The Line Calculator method on PSS/ADEPT and the MATLAB software were used to calculate the Positive, Negative and Zero Sequence Impedance and the Positive, Negative and Zero Admittance of the line/cable. It is important to notice on the Impedance results, the real value is resistance and the imaginary value is reactance, and on the Admittance results, the real value is conductance and the imaginary value is susceptance. The data given on the IEEE 34 Node Test Feeder sheet of Impedances was on phase impedance values, and need to be changed to sequence impedance values when using the MATLAB software, by using the Transformation Matrix and get results. This Distribution Feeder is constructed with two different conductors spacing, the ID-500 composed of three phases and the ID-510 of

single phase, and each line/cable configurations contains a different conductor spacing. In the model are two shunt capacitors that both are actually balanced on the three phases but each containing different power. After modeling certain components on the Feeder, start with the debug of the Load Flow on PSS/ADEPT Software and the study of the results. Run more Load Flow studies with Distributed Generation added to the Feeder and observe the changes by comparing the results obtained before.