Introduction

Southern California Edison provides electric service to over 4 million customers in a service territory encompassing over 50,000 square miles of Southern California. Part of operating this vast system includes inspecting and maintaining over 500,000 distribution transformers. Electric utility distribution transformers can experience a failure mode causing a low level of internal arcing in the dielectric oil that generates acetylene gas. Over time, this low-level arcing causes the acetylene gas to accumulate in the transformer and can reach explosive concentration levels. This internal arcing is very difficult to detect in field testing of the transformer.

Project Overview

Southern California Edison proposes this project with the goal to develop a method that can be used safely in the field to recognize the presence of acetylene gas in distribution transformers prior to energizing. This project will require gathering information on available gas sampling and analysis technologies. An analysis will look at how these technologies could be applied to field gas testing of distribution transformers. The method of detecting acetylene may be either electronic or chemical in nature. Quantitative as well as qualitative assessments shall be created to provide prototypes that demonstrate the concept. The prototype acetylene detection devices and documentation shall be provided to Edison at the conclusion of the project for further tests, verification, and development.