Electric Distribution R&D Peer Review 2006
Project Summary

YOUR ORGANIZATION:	**Southern California Edison Company**
PROJECT TITLE:	**Advanced Protection Methods on SCE's Distribution Circuit of the Future**
PRESENTERS:	George D. Rodriguez
FY 2005 FUNDING:	$ 0
FY 2006 FUNDING:	~ $ 500k
START/COMPLETION DATES:	6/01/2006 -12/31/2008

Overall Project Purpose and Objectives: The objective of this project is to better detect and isolate faults on the distribution system so that customer interruptions will be minimized in both frequency and duration. The project has three tasks: testing new protection methods on SCE's Distribution Circuit of the Future (CoF) with networked fault interrupters; design and testing of protection methods with a fault current limiter installed at the circuit head; and investigation/ design/ testing of various fault prediction methods. All testing will be done on the SCE Circuit of the Future which is located near San Bernardino, CA and is scheduled to go into operation by June 2006. Fault current limiter installation is scheduled for late 2006. Fault prediction sensors will be installed when they become available. When a fault occurs on a distribution circuit today, the substation circuit breaker opens and all customers on the circuit lose power. Having a method to reduce interruptions to customers will save them money and annoyance.
Benefits include:

- Provide customers with better service
- Improve operation efficiencies and safety
- Reduce Operation/Maintenance costs

Milestone	Description	Planned Completion	Status
Task1 – Complete tests of protection on the Circuit of the Future	Design review and performance tests of protection on Circuit of the Future	12/2006	Not started
Task 2 – Complete tests of protection on CoF with a Fault Current Limiter	Design, install and test protection with fault current limiter	6/2007	Not started
Task 3 – Report in advanced fault sensing and prediction	Design, install and test fault prediction system	12/2008	Not started

Project Funding ($MM)

Source	Total Award	Current Year (FY05)	Total Remaining
DOE	$982k	$0	$982k
Non-DOE	$630k	$0	$630k

FY 2005 and FY 2006 Results and Accomplishments: Project kick-off meeting held with KEMA and Virginia Tech principals in Dec 2005. Contract not officially approved to date.

FY 2007 Plans and Expectations: The project will design and test new protection methods with and without a fault current limiter. In addition, new fault sensing and prediction techniques will be studied and tested on the SCE Distribution Circuit of the Future.

Most distribution circuits do not have devices installed to allow interruption to portions of a circuit (fault interrupters) or sensors to quickly detect problems. Sufficient communications (speed and quantity) are also not present to take advantage of new sensors and fault interrupters. As new distribution circuits are

built for new load or older circuits refurbished, additional sensors, fault interrupters, and communications can be added with minimal increase in costs.

The project may have difficulties in getting sensors that can be easily installed on distribution lines and producing dependable signatures that show equipment that is about to fail and cause a fault.
The biggest risk is that the equipment and methods developed as part of this project will be too expensive or difficult to install that they will not be widely used in the electric utility industry.

Public/Private Partnerships: Project partners include Virginia Tech (research work on fault prediction), KEMA (experienced utility consulting company). We have also worked with the California Energy Commission, national labs and several equipment vendors in the development of the Distribution Circuit of the Future.

Partners

	Utilities	States	Fed Gov't	Equip Suppliers	ISO/RTO	Universities	National Labs	Other
Partners	So Cal Edison					Virginia Tech		KEMA
Cost Share	$530k					$55k		$45k