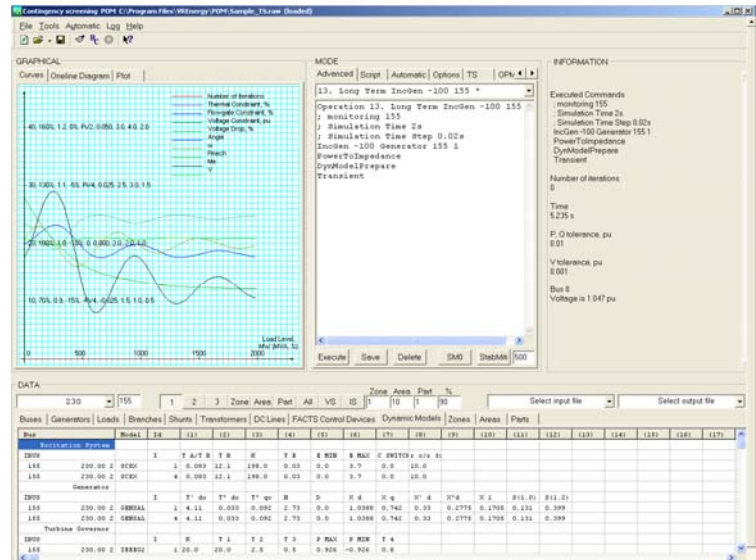


K035 : REACTIVE POWER FORECASTING TO ASSIST VAR PLANNING

PROJECT RATIONALE:

A byproduct of electric distribution systems using alternating current is reactive power. Reactive power (also referred to as “VAR”s) results when voltage and current are not in phase with each other. Reactive power is required to maintain voltage through transmission lines; motor loads require VARs to convert the flow of electrons into useful work.

In planning for growth on the transmission and distribution systems, it is necessary to estimate reactive power losses. The focus of reactive power planning is to find the most economical investment plan for new VAR sources at selected load buses, while maintaining proper voltages. In the past, VAR planning has been conducted with little consideration for the time-varying nature of reactive power. In practice, resource planners focus on future active power demand through a conventional load forecast using a typical power factor band for the reactive power flow at grid interface points.



Recent voltage stability problems, due to lack of reactive power resources or their inappropriate controls, indicate that certain utility practices and operating guidelines offer opportunities for improvement. System planners and operators need tools and methods to better foresee the dynamic changes of reactive power demands and resources. They need to better recognize significant changes of network reactive power demand and supply based on loading, voltage profile and topology changes due to maintenance, contingency and resulting mitigation measures.

The immediate value of this project will be a more accurate reactive power forecasting tool over a wide range of time-horizons. Accurate knowledge of reactive power demand and profile will allow system planners and operators to choose more resource and control options to guarantee reliable and economic grid planning and operations.

This project was authorized by Electric Operations on October 21, 2009. The contract was executed on December 11, 2009 and is in the process of submission to the NYS OSC/AG for approval.

RELATIONSHIP TO LIPA’S MISSION:

Strategic Objectives

- Promote a healthy environment through leadership in efficiency and renewables.
- Balance the objectives of the electric resource plan with the impact on customer bills
- Maintain high reliability of the bulk electric system
- ✓ Maintain high reliability of the distribution system
- Position LIPA to respond rapidly to change in order to manage risk

This program area is consistent with LIPA’s Energy Plan and is specifically aimed at minimizing the cost of energy to the customer by finding ways to use electricity more efficiently and providing greater customer satisfaction and control of energy costs..

EPRI was selected as the Sole Source vendor to take advantage of their pre-existing and continuing research in this area in collaboration with other utilities. Joining this project through EPRI provides a significant opportunity to leverage research funding.

SCHEDULE:

Project Duration:	13 months
Start Date:	12/15/2009
Planned Completion Date:	12/31/2010

SUMMARY OF COSTS:

	Budget
LIPA	\$40,000
Other Funding	
EPRI	\$40,000
Other Utilities	\$80,000
Cumulative	\$160,000
Leveraging	4:1

DELIVERABLES:

	<u>Planned Date</u>
• Project kick-off meeting	Dec 2009
▪ Reactive power forecasting models	Sep 2010
▪ Final report.	Dec 2010

TECHNOLOGY TRANSFER ACTIVITIES:

Planning engineers are intimately involved in the conduct of this project. They will integrate the reactive power forecasting tool into the existing peak load reactive load forecast. Results of the project will allow for integration of short-term reactive load forecast (24-48 hrs) into the planning process. In the long term, the results will be integrated with intelligent grid reactive resource optimization effort to reduce system losses and to improve voltage performance of LIPA’s T&D system.

O 073: Efficient Transmission & Distribution Systems for a Low-Carbon Future (EPRI Program 172)

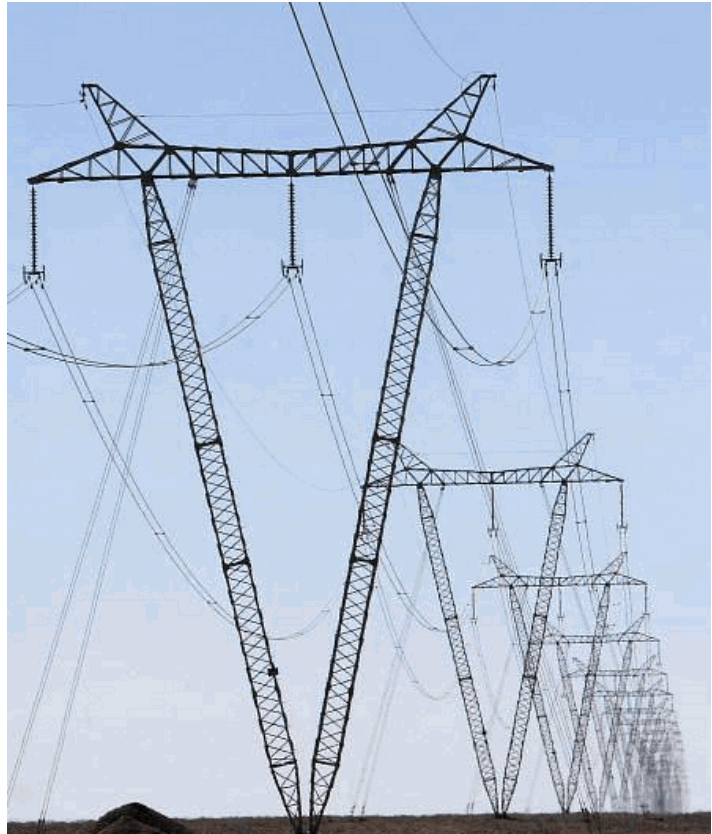
PROJECT RATIONALE:

As utilities seek to increase transmission and distribution system efficiency they are also focused on reducing their overall greenhouse gas footprint.

This program has been developed by EPRI to help utilities prepare for operating in a low-carbon business environment and to deal with the related impacts on transmission and distribution (T&D) system operation, maintenance, and planning. Key research and delivery (R&D) activities include three facets: integrating energy efficiency and demand response into a comprehensive planning process; assessing the costs, benefits, and performance of technologies capable of reducing T&D losses; and assessing the implications of climate change on future T&D systems to improve the risk management of assets and reliability modeling.

EPRI research in efficient T&D systems will yield a variety of data and knowledge that will be beneficial to program members. This information will come in a variety of forms and is expected to offer members short- and long-term value. A team of experts will gather data and information from a number of sources to develop strategic assessments and reports on a number of relevant subjects such as climate change impacts on T&D systems or ways to quantify temporal and spatial variation in losses across T&D systems. The team will also develop reports, case studies, and workshops to help capture and share this information with program participants.

This project was presented to the LIPA Board and approved as part of the 2010 R&D budget. Electric Operations authorized the project on January 19, 2010. The participation was pre-approved by the NYS OSC/AG on July 15, 2009 as part of a three year Master Agreement between LIPA and EPRI.



RELATIONSHIP TO LIPA'S MISSION:

Strategic Objectives

- √ Promote a healthy environment through leadership in efficiency and renewables.
 - √ Balance the objectives of the electric resource plan with the impact on customer bills
 - √ Maintain high reliability of the bulk electric system
 - √ Maintain high reliability of the distribution system
 - √ Position LIPA to respond rapidly to change in order to manage risk
-

The range of projects in this program area is consistent with LIPA’s Energy Plan and is specifically aimed at enhancing the reliability of the transmission and substation system while at the same time maximizing efficiency.

EPRI was selected as the sole source vendor in order to take advantage of their existing program in this area and gain the benefits of the collaborative research funding opportunity.

SCHEDULE:

Project Duration:	15 months
Start Date:	01/01/2010
Planned Completion Date:	03/31/2011

SUMMARY OF COSTS:

	Budget
LIPA	\$111,757
Other Funding	
EPRI	\$1,633,629
Cumulative	\$1,745,386
Leveraging	15 : 1

DELIVERABLES:

	<u>Planned Date</u>
• A Planning Guide of Methods and Protocols for Employing Energy Efficiency and Demand Response as Distribution System Resources	12/31/2010
• Distribution Efficiency Technology Assessment	12/31/2010
• Guidebook for Integrating Energy Efficiency and Demand Response into Transmission Planning	12/24/2010
• Impact of Climate Change on Distribution Systems	12/31/2010
• Impact of Climate Change on Transmission Systems	12/31/2010
• Strategic Intelligence and Technology Watch Newsletters	12/31/2010
• Technology Risk Management Strategies for Distribution Systems in a Carbon-Constrained World	12/31/2010

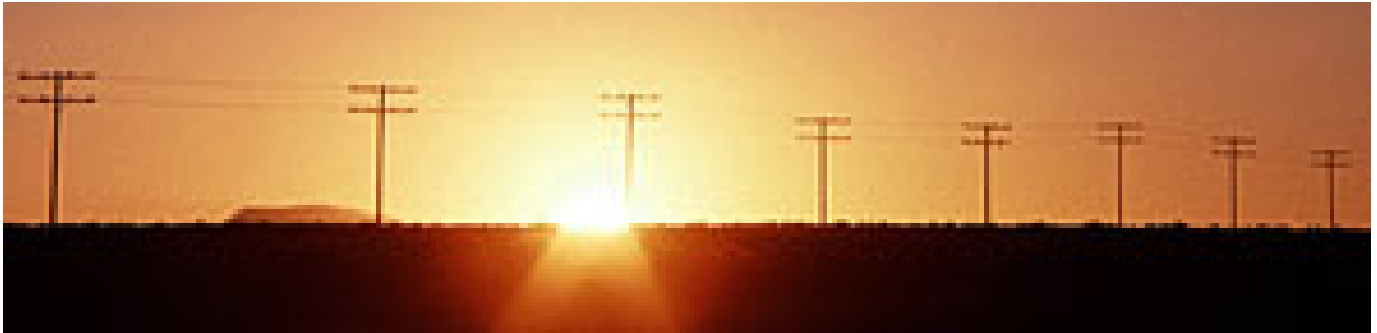
TECHNOLOGY TRANSFER ACTIVITIES:

Planning personnel are intimately involved with the day-to-day research in this program. In addition, results will be disseminated through reports and presentations developed during the research period.

PROJECT O119: UNDERGROUND DISTRIBUTION SYSTEMS, DISTRIBUTION SYSTEMS AND ADVANCED DISTRIBUTION SYSTEMS

(EPRI Programs 30, 124, 128)

PROJECT RATIONALE:



This distribution program is a combination of three distinct but related EPRI Program areas:

- Underground Distribution Systems
- Distribution Systems
- Advanced Distribution Automation

Research in the Underground Distribution Systems Program provides unbiased scientific analysis, products, technology, design alternatives, and construction methods that enable the electric distribution industry to improve financial performance, reliability, safety and health, customer satisfaction, as well as advance societal priorities and strategically transform the industry with technical advancements. In parallel, work has also begun to address the aging workforce and retain the level of expertise through the use of innovative training and knowledge transfer guides and tools developed by EPRI.

The Distribution Systems infrastructure in the United States is three times the size of the transmission system. While the networks are aging, demands for power are increasing and the drive for continuous improvements in reliability is relentless. This program focuses on improving reliability, reducing costs, and positioning distribution utilities as informed buyers and users of new technologies. As the industry debates the repair versus replacement decision for an aging infrastructure, the focus must shift to new technologies and the associated opportunities.

Participation in the Advanced Distribution Automation Program provides each participating member with the technology and tools needed to upgrade their systems and to keep pace with emerging trends and stakeholder demands relative to the Distribution System of the Future. Customers and regulators will demand more types of services, higher levels of service quality, higher system reliability, and increased system efficiency (lower electrical losses) as they become aware that the advances in technology make their higher levels achievable. This program assists members in addressing those anticipated demands by creating the technology basis for the Distribution System of the Future and investigating the most efficient methods of adding these advanced tools and equipment to the existing system.

This project was presented to the LIPA Board and approved as part of the 2010 R&D budget. Electric Operations authorized the project on January 19, 2010. The participation was pre-approved by the NYS OSC/AG on July 15, 2009 as part of a three year Master Agreement between LIPA and EPRI.

RELATIONSHIP TO LIPA’S MISSION:

Strategic Objectives

- Promote a healthy environment through leadership in efficiency and renewables.
- √ Balance the objectives of the electric resource plan with the impact on customer bills
- Maintain high reliability of the bulk electric system
- √ Maintain high reliability of the distribution system
- √ Position LIPA to respond rapidly to change in order to manage risk

The range of projects in this program area is specifically aimed at maintaining and enhancing the reliability of the distribution system and the development of new technologies and methods.

EPRI was selected as the sole source vendor in order to take advantage of their existing and continuing program in this area and gain the benefits of the collaborative research funding opportunity.

SCHEDULE:

Project Duration: 15 Months
 Start Date: 01/01/2009
 Planned Completion Date: 3/31/2010

SUMMARY OF COSTS:

	Budget
LIPA	\$179,343
Other Funding	
EPRI	\$4,395,828
Cumulative	\$4,575,170
Leveraging	25 : 1

DELIVERABLES:

	<u>Planned Date</u>
• Arc Flash Phase II Work Practices Survey Report	18-Dec-09
• Advanced Diagnostics for Underground Cable and Cable Systems	31-Dec-10
• Distribution Cable Fleet Management: Catalogue and Assessment of Industry Maintenance Practices	31-Dec-10
• Sensors for Distribution Systems	31-Dec-10
• Nano Dielectrics for distribution cables and cable systems	31-Dec-10
• Urban Network Systems Practices	31-Dec-10
• Urban Network Simulation Tools	31-Dec-10

TECHNOLOGY TRANSFER ACTIVITIES:

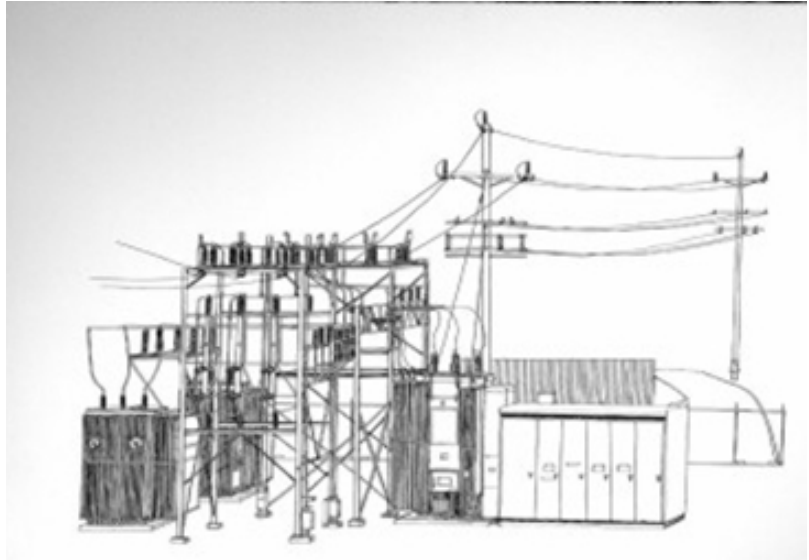
Planning personnel are intimately involved with the day-to-day research in this program. In addition, results will be disseminated through reports and presentations developed during the research period.

O120: TRANSMISSION AND SUBSTATIONS (EPRI Program 35, 36, 37)

PROJECT RATIONALE:

Transmission companies are faced with issues such as improving safety and reliability, as well as cutting operations and maintenance (O&M) costs. They are also seeking ways to increase transmission capacity without making large capital investments. Reducing capital expenditures for new/refurbished equipment is yet another priority.

This EPRI research program is designed to address the research needs of transmission asset owners. The program includes projects focused on specific components (e.g., insulators, compression connectors, and crossarms) as well as projects focused on specific issues (e.g., lightning and grounding, live working, and transmission capacity).



The program delivers a blend of short-term tools such as software and reference and field guides, together with longer-term research such as component aging testing and the development of sensors for monitoring line components and performance.

The substation program helps substation owners enhance safety, reliability, equipment life, and performance despite shrinking maintenance budgets. It offers a complete portfolio of tools and technologies such as transformer monitoring. The program also includes resources such as failure databases and aging models to improve transformer and circuit breaker life management. It may help operations and maintenance (O&M) engineers extend equipment life, optimize maintenance costs, and reduce outages.

This project was presented to the LIPA Board and approved as part of the 2010 R&D budget. Electric Operations authorized the project on January 19, 2010. The participation was pre-approved by the NYS OSC/AG on July 15, 2009 as part of a three year Master Agreement between LIPA and EPRI.

RELATIONSHIP TO LIPA’S MISSION:

Applicability of LIPA’s Objectives

- ✓ Promote a Healthy Environment through leadership in efficiency and renewables.
 - ✓ Balance the objectives of the electric resource plan with the impact on customer bills.
 - ✓ Maintain high reliability of the bulk electric system.
 - ✓ Maintain high reliability of the distribution system.
 - ✓ Position LIPA to respond rapidly to change in order to manage risk.
-

The range of projects in this program area is specifically aimed at enhancing the reliability of the transmission and substation system by enhancing the planning for system stability and grid reliability and maximizing asset usage and life.

EPRI was selected as the sole source vendor in order to take advantage of their on-going program in this area and gain the benefits of the collaborative research funding opportunity.

SCHEDULE:

Project Duration: 15 months
 Start Date: 1/1/2010
 Planned Completion Date: 3/31/2011

SUMMARY OF COSTS:

	Budget
LIPA	\$259,324
Other Funding	
EPRI	\$7,073,273
Cumulative	\$7,332,598
Leveraging	28 : 1

DELIVERABLES

	<u>Planned Date</u>
• Alternative Grounding Electrodes	12/31/2010
• Assessment of Shield Wire Inspection Technologies	12/31/2010
• Biannual Overhead Transmission Lines Conference	12/31/2010
• Compression Connector Population Management	12/31/2010
• DAP 2.0	12/31/2010
• DTCR 5.1	12/31/2010
• Effect of Seasonal Variations on Transmission Line Grounding	12/31/2010
• Evaluation of Remediation Techniques	12/31/2010
• Foundation Designs and Analysis for Towers	12/31/2010
• Future On-line E-Learning Modules, Workshop, and Webcasts	12/31/2010
• Increased Power Flow Conference	11/30/2010
• IPF Guidebook (Platinum Book), Third Edition	12/31/2010
• IPF Transmission Circuit Rating Wizard , 2.0	12/31/2010
• Life-Cycle Cost Analysis for Overhead Transmission Lines	12/31/2010
• Literature Survey of Crossarm Inspection Tools and Techniques	12/31/2010
• New Set of Pictorial Guides	12/31/2010
• New Version of Tflash	12/31/2010
• Overhead Shield Wires Management Guide - Final	12/31/2010
• Reference Guide	12/31/2010
• Report on Crossarm Degradation Modes	12/31/2010
• Test Setup for Evaluation of Crossarm Technologies	12/31/2010
• TLSA Testing	12/31/2010

- Transmission Line Workstation Master Program - Prototype 12/31/2010
- Workshop for Life-Cycle Cost Analysis for Overhead Transmission Lines 12/31/2010
- Advanced Sensors and Inspection Techniques for Extruded Dielectric Transmission Cable Systems 12/31/2010
- Condition Assessment Techniques for Laminar Dielectric Cable Systems 12/31/2010
- Corrosion of Steel Pipes used in Pipe-type Cable Systems 12/31/2010
- Experimental Protocol and Test Rigs for Study of TM performance of HPFF Cables 12/31/2010
- Experimental Verification of TM Models for Extruded Dielectric Cables in Ducts and Pipes 12/31/2010
- High Stress Cable and Accessories Using Nano-Composites 12/31/2010
- Leak Detection and Location in HPFF and SCFF Cables 12/31/2010
- Safety in underground transmission construction, installation, operation, and maintenance 12/31/2010
- Underground transmission cable system installation and construction practices manual 12/31/2010
- Update of EPRI Underground Transmission Systems Reference Book – 2006 Edition 12/31/2010
- UT Workstation: functional and technical enhancements 12/31/2010
- Novel Sensors for Transformer Diagnosis 12/31/2010
- Annual conference on switching safety and reliability 12/31/2010
- Balance of Substation – Equipment Specific Condition Assessment and Life Extension Techniques 12/31/2010
- Balance of Substation Equipment – Research Needs Assessment Roadmap 12/31/2010
- Catalogue and Assessment of Industry Maintenance Best Practices for Substation Equipment 12/31/2010
- Communication between field personnel and control center - Utility practices 12/31/2010
- Database of incidents and near-misses in switching 12/31/2010
- EPRI Copper Book Development (Power Transformer Guidebook) 12/31/2010
- Equipment Risk and Performance Assessment 12/31/2010
- Identifying error-likely situations in power switching 12/31/2010
- Maintenance Effectiveness Assessment 12/31/2010
- Recommendations for certification of switching personnel 12/31/2010
- Switching Fundamentals Guide and Training Manual 12/31/2010
- Tools to Convert Transformer Data into Action 12/31/2010

TECHNOLOGY TRANSFER ACTIVITIES:

Planning personnel are intimately involved with the day-to-day research in this program. In addition, results will be disseminated through reports and presentations developed during the research period.

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O122: GRID OPERATIONS AND PLANNING (EPRI Program 39, 40)

PROJECT SUMMARY AND RATIONALE:

Utilities, transmission companies, and ISOs/RTOs need to plan for future demand growth and provide transmission services for changing generation portfolios and balancing distribution resources as loads vary. The challenge of meeting reliability requirements with the addition of variable generation and allowing demand response as a capacity resource may necessitate transmission planning to reassess the planning objectives. Planning for peak load scenarios may not be sufficient. Evaluation of additional scenarios such as low load and shoulder load, as well as intermittent availability of variable resources may also be required. Variable resources have two other characteristics that need to be addressed in planning: uncertainty, and a regional nature beyond the traditional utility boundaries.



Strategic issues that grid planners need to resolve include:

- Increasing uncertainty of future generation and load
- Higher utilization of transmission assets and right-of-ways
- Higher reliability standards and greater regional planning.

An additional focus of this program is to identify and develop solutions and decision support tools for planners to deal with specific technology gaps to improve overall planning activities.

Participation in EPRI's Grid Planning program looks to produce:

- A framework of adjusted planning objectives to deal with supply and load uncertainties.
- Standard planning characteristics of non-traditional resources and resource capacities.
- Improved modeling and simulation capabilities of more complex operating conditions.
- Understanding of the impact of reliability standards.
- Robust transmission systems.

This project was presented to the LIPA Board and approved as part of the 2010 R&D budget. Electric Operations authorized the project on January 19, 2010. The participation was pre-approved by the NYS OSC/AG on July 15, 2009 as part of a three year Master Agreement between LIPA and EPRI.

RELATIONSHIP TO LIPA’S MISSION:

Applicability of LIPA’s Objectives

Promote a Healthy Environment through leadership in efficiency and renewables.
Balance the objectives of the electric resource plan with the impact on customer bills.

- √ Maintain high reliability of the bulk electric system.
- √ Maintain high reliability of the distribution system.
- √ Position LIPA to respond rapidly to change in order to manage risk.

This project is consistent with LIPA’s Energy Plan and is specifically aimed at enhancing the reliability of the bulk power and distribution system by enhancing the planning for system stability and grid reliability.

EPRI was selected as the sole source vendor in order to take advantage of their pre-existing and on-going program in this area and gain the benefits of the collaborative research funding opportunity.

SCHEDULE:

Project Duration: 1 year
Start Date: 01/01/2010
Planned Completion Date: 12/31/2011

SUMMARY OF COSTS:

	Budget
LIPA	\$145,776
Other Funding	
EPRI	\$2,734,899
Cumulative	\$2,880,675
Leveraging	18 : 1

DELIVERABLES:

	<u>Planned Date</u>
• A Decision Support Tool for Evaluating Restoration Strategy Options	12/31/2010
• Application Success Stories of Synchro-Phasors	12/31/2010
• Balancing Economics and Reliability to Evaluate Planning Options under Competitive Environment	12/31/2010
• Determination of Load Composition using Smart Meter Data	12/31/2010
• Development of Methods to Reduce Restoration Time and Determine the Preferred Level of Blackstart Capability	12/31/2010
• Economic Case Studies of Technology Options for Increased Transmission Capacity	12/31/2010
• Functional Requirements: Integration of Substation and Equipment Health Information to Improve Operation Awareness	12/31/2010

- Generic Modeling of Transmission and Synchronous Generation Technologies 12/31/2010
- Guidelines for Human-centered Situational Awareness 12/31/2010
- Indication of Potential Cascading Outages using Measurement Data 12/31/2010
- Methodologies for Economically Assessing Technology Options for Increased Transmission Capacity 12/31/2010
- Preventive and Emergency Control to Minimize the Impact of System Separation 12/31/2010
- Probabilistic Measure of Likelihood for Various Categories of Contingencies 12/31/2010
- Report on New Planning Framework 12/31/2010
- Transmission Portfolio Planning Under Uncertainty 12/31/2010
- Transmission System Model Management 12/31/2010
- Workshop on Methodology and Planning Framework 12/15/2010
- Workshop on Modeling Modern Static Var Systems 12/31/2010
- Workshop on situation awareness guidelines 12/31/2010

TECHNOLOGY TRANSFER ACTIVITIES:

Planning personnel are intimately involved with the day-to-day research in this program. In addition, results will be disseminated through reports and presentations developed during the research period.

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X107: EPRI PULSE CLOSER

PROJECT RATIONALE:

Pulse closing is a new technology for overhead distribution system protection. Pulse closing is an alternative to conventional reclosing. It uses a new method for verifying that the associated line has cleared a fault before initiating a closing operation. It is expected to significantly reduce stress on system components as well as improve power quality experienced by customers upstream of a fault.

This project will help LIPA identify possible applications and impacts of a new distribution protection technology and understand the technical and economic impacts of reclosing into existing faults on line and substation equipment life.



This project was authorized by Electric Operations on September 22, 2009. The contract was executed on December 16, 2009.

RELATIONSHIP TO LIPA'S MISSION:

Strategic Objectives

- Promote a healthy environment through leadership in efficiency and renewables.
 - Balance the objectives of the electric resource plan with the impact on customer bills
 - Maintain high reliability of the bulk electric system
 - √ Maintain high reliability of the distribution system
 - √ Position LIPA to respond rapidly to change in order to manage risk
-

This project is consistent with LIPA's Energy Plan and is specifically aimed at enhancing the reliability of the distribution system by extending component life and improving quality of power to the customer.

EPRI was selected as the sole source vendor in order to take advantage of their pre-existing and on-going program in this area and gain the benefits of the collaborative research funding opportunity.

SCHEDULE:

Project Duration: 12 Months
 Start Date: 01/01/2010
 Planned Completion Date: 12/31/2010

SUMMARY OF COSTS:

	Budget
LIPA	\$15,000
Other Funding	
EPRI TC	\$15,000
Cumulative	\$30,000
Leveraging	2 : 1

DELIVERABLES:

Planned Date
12/31/10

- Report on the assessment results, test procedures, modeling procedures, technical and economic assessment and application guidelines for pulse closing.

TECHNOLOGY TRANSFER ACTIVITIES:

Operations personnel are intimately involved with the day-to-day research in this program. In addition, results will be disseminated through reports and presentations developed during the research period.

Y011 : TAP CHANGER MONITORING

PROJECT RATIONALE:

Transformers in substations regulate voltage to follow load and keep the distribution system stable. In a substation transformer, the voltage regulation is performed within a transformer using a Load Tap Changer (LTC). Typically, one contact in the LTC is stationary and the other contact moves. The physical designs of LTC's differ from one to another based on the manufacturer of the transformer, but when a LTC contact has too much wear, there was a possibility for arcing or transformer failure.

Over the past 5 years, EPRI, in partnership with Nichols Applied Technology, has developed contacts for different manufacturer LTCs that contain embedded material. When the contact in a LTC wears with repeated use, the embedded material is released into the LTC oil compartment and can be detected through periodic analysis.



Detection of the embedded material in the oil has been the subject of research over the past two years. A monitor has been developed by EPRI and licensed to Nichols Applied Technology which can detect the embedded trace material. Initially, the new online monitor was designed to detect heating and coking. Acetylene and ethylene are the principal gasses generated during heating and coking, and algorithms have been developed that indicate elevated temperatures or that coking is occurring. The concept was to develop a low cost online monitor that would detect and analyze these gasses. The monitor was subsequently expanded to include an additional infrared channel for the detection of PFC, the basis of PFT (Perfluorocarbon Tracer Technology). PFC is generated during the decomposition of hexafluorobenzene, the trace chemical used in the contacts and not related to the combustible gasses otherwise generated.

Utilizing the contacts with the monitor would provide protection against LTC failures through early detection on contact wear, heating, and coking. The value would be the protection of a transformer which would be very costly to replace if failure were to occur.

This project is in the process of being authorized by LIPA.

RELATIONSHIP TO LIPA'S MISSION:

Applicability of LIPA's Objectives

Promote a healthy environment through leadership in efficiency and renewables
Balance the objectives of the electric resource plan with the impact on customer bills

- √ Maintain high reliability of the bulk electric system
 - √ Maintain high reliability of the distribution system
 - √ Position LIPA to respond rapidly to change in order to manage risk
-

This program area is specifically aimed at maintaining high reliability of the bulk electric and distribution system.

Nichols Applied Technology is the selected sole source vendor. Nichols Applied Technology has an exclusive license to commercialize the monitor.

SCHEDULE:

Project Duration:	15 months
Start Date:	04/01/2010
Planned Completion Date:	07/31/2011

SUMMARY OF COSTS:

	Budget
LIPA	\$40,000
Other Funding	
N/A	\$0
Cumulative	\$40,000
Leveraging	1:1

DELIVERABLES:

	Planned Date
• Movable contacts	05/30/10
▪ Gas Monitor	05/30/10
▪ Dissolved Gas Analysis and sampling syringes	05/30/10

TECHNOLOGY TRANSFER ACTIVITIES:

Operations will install the monitor and embedded contacts on a substation transformer and will perform periodic Dissolved Gas Analysis (DGA) to monitor the condition of the transformer LTC. Information from the monitor will be collected on a routine basis as part of routine maintenance. Results of the dissolved gas analysis will be compared to the monitored results.