



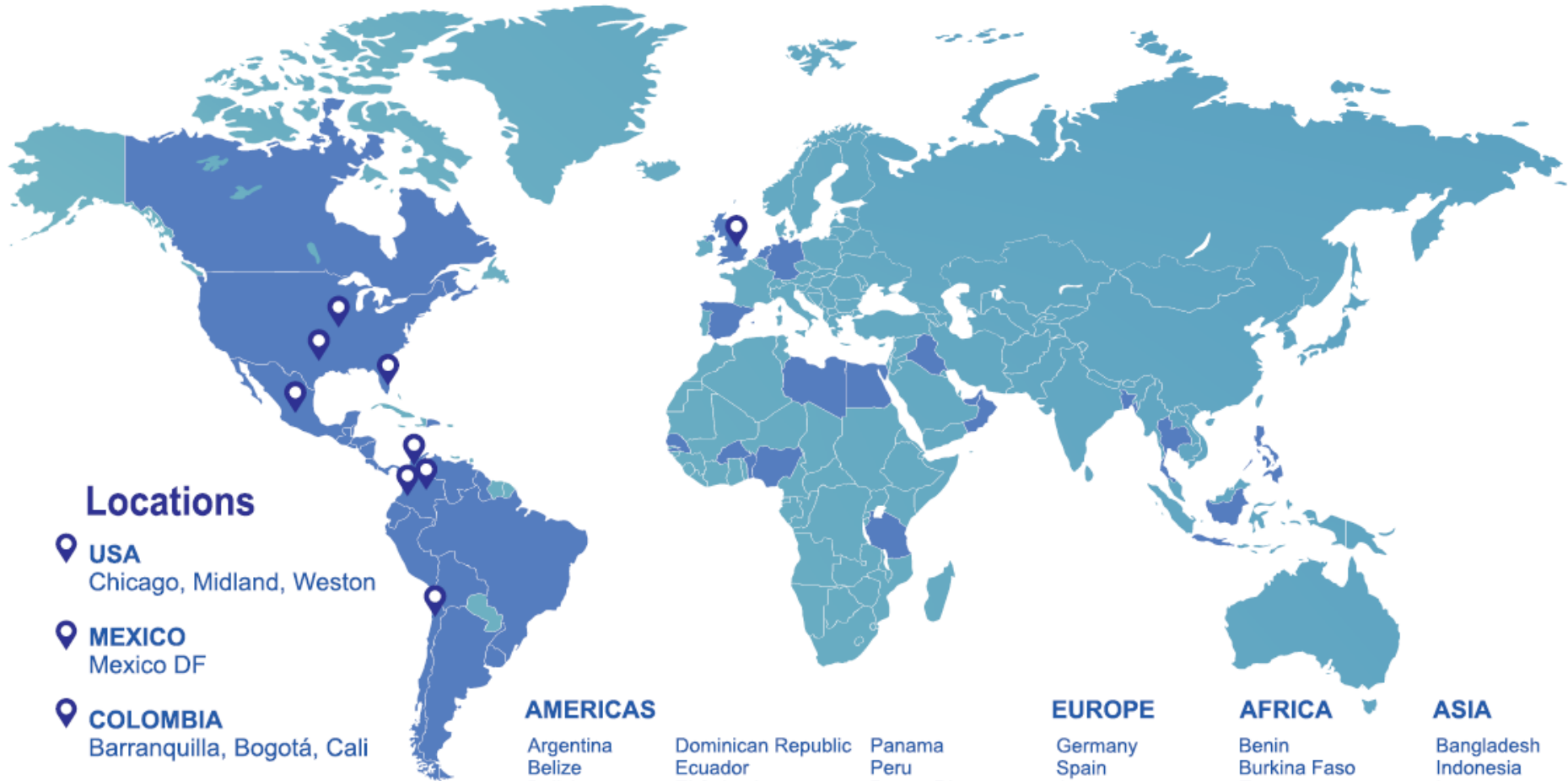
# GERS

## PORTFOLIO OF SERVICES AND CAPABILITIES






**GERS** is a group with more than 42 years of experience that provides Consulting Services in Electrical Engineering and associated areas. The group has incorporated companies in USA, Mexico, Colombia, Chile and UK.



**GERS** has been involved in the completion of projects of important sizes and complexity for utilities, oil and gas facilities, industrial and commercial organizations of more than 45 countries around the world over the past four decades.



## Locations

-  **USA**  
Chicago, Midland, Weston
-  **MEXICO**  
Mexico DF
-  **COLOMBIA**  
Barranquilla, Bogotá, Cali
-  **CHILE**  
Santiago de Chile
-  **UK**  
Sheffield

## AMERICAS

- |            |                    |                   |
|------------|--------------------|-------------------|
| Argentina  | Dominican Republic | Panama            |
| Belize     | Ecuador            | Peru              |
| Bolivia    | El Salvador        | Puerto Rico       |
| Brazil     | Guatemala          | The Bahamas       |
| Canada     | Guyana             | Trinidad & Tobago |
| Chile      | Haiti              | United States     |
| Colombia   | Honduras           | Uruguay           |
| Costa Rica | Mexico             | Venezuela         |
| Curacao    | Nicaragua          |                   |

## EUROPE

- Germany
- Spain
- Switzerland
- United Kingdom

## AFRICA

- Benin
- Burkina Faso
- Egypt
- Libya
- Nigeria
- Senegal
- Tanzania

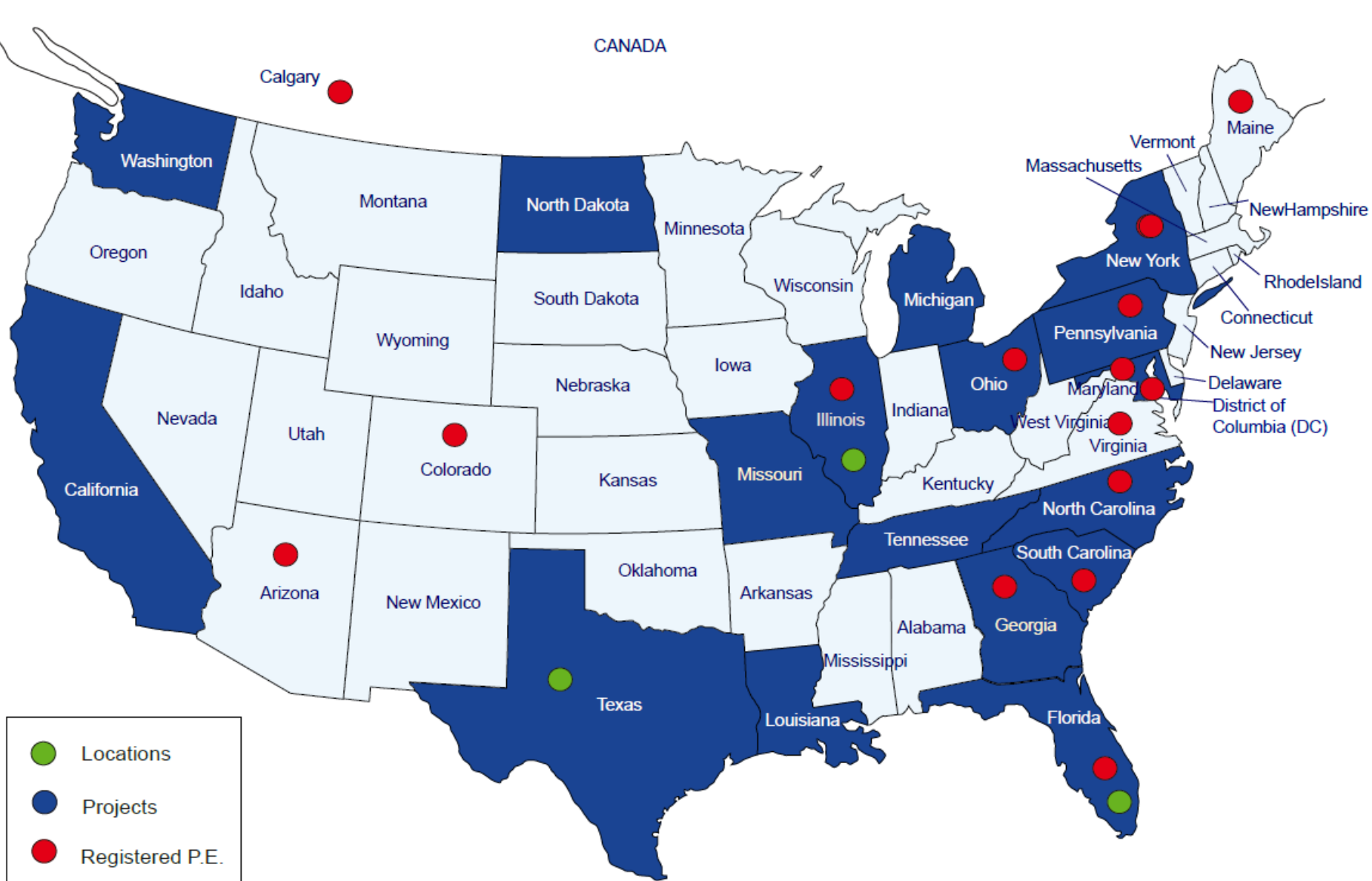
## ASIA

- Bangladesh
- Indonesia
- Iraq
- Kuwait
- Myanmar
- Oman
- Philippines
- Thailand
- United Arab Emirates



# LOCATIONS, PROJECTS, REGISTERED P.E.

# GERS

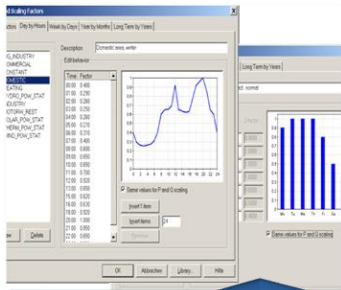






# PORTFOLIO OF SERVICES

# GERs



**POWER SYSTEMS STUDIES**



**INDUSTRIAL / OIL & GAS**



**DESIGN & ENGINEERING**



**FIELD SERVICES**



**SMART GRIDS**



**PSAT SUPPORT**



**TRAININGS**





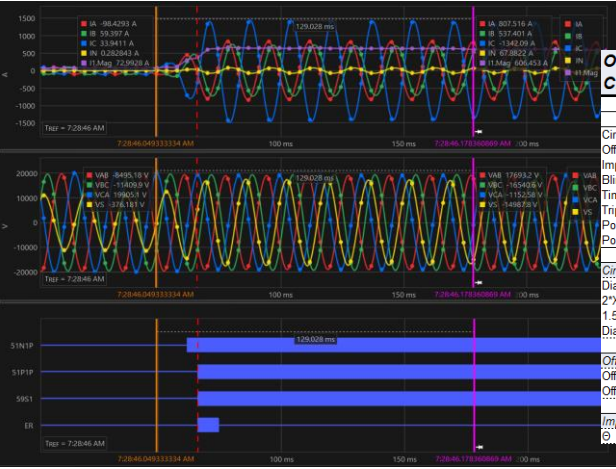
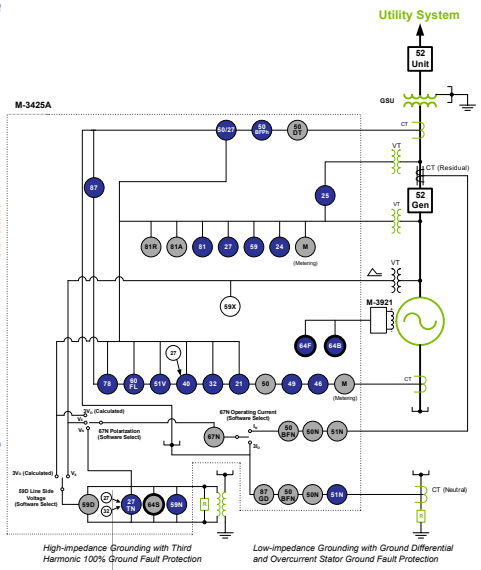
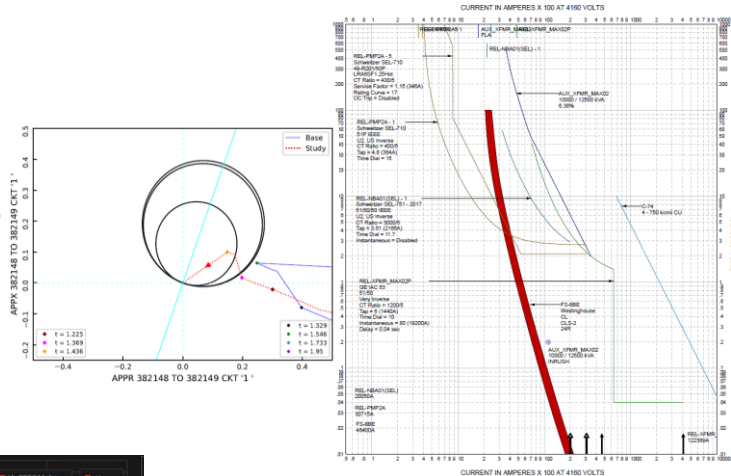
# POWER SYSTEMS STUDIES

## Protection Settings Calculation

# GERS

### System Protection and Relaying

- Setting Calculations and adjustment
- SPS Calculations
- NERC Compliance
- Generate relay files for protection testing, including operational logics
- Analysis of relay events



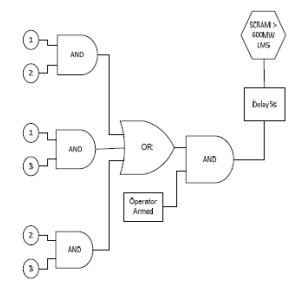
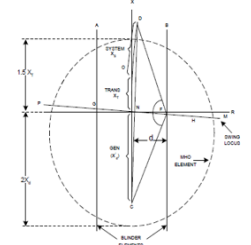
### OUT OF STEP (MHO CHARACTERISTIC) (78)

Function	Setting Name	Value
Circle Diameter	78 DIAMETER	16.3
Offset	78 OFFSET	-9.5
Impedance Angle	78 IMPEDANCE ANGLE	90
Blinder	78 BLINDER IMPEDANCE	90.00
Time Delay	78 DELAY	5
Trip on mho Exit	78 TRIP ON MHO EXIT	ENABLE
Pole Slip Counter	78 POLE SLIP COUNT	1
Pole Slip Reset	78 POLE SLIP RESET 1	120

Circle Diameter:  
 Diameter is set at  $(2 \times Xd + 1.5 \times XT)$  C37.102-2006, Sec. A 2.2  
 $2 \times Xd$ : 9.54562  $\Omega$   
 $1.5 \times XT$ : 6.77332  $\Omega$   
 Diameter Setting: 16.3  $\Omega$

Offset:  
 Offset is set to  $-2 \times Xd$ : C37.102-2006, Sec. A 2.2  
 Offset Setting: -9.5  $\Omega$

Impedance Angle:  
 90  $^\circ$





### Transmission Planning

- Subsynchronous resonance
- Voltage Control
- Voltage Balance
- Protection Response Evaluation
- Insulation Coordination
- Post-mortem analysis

### Control Tuning

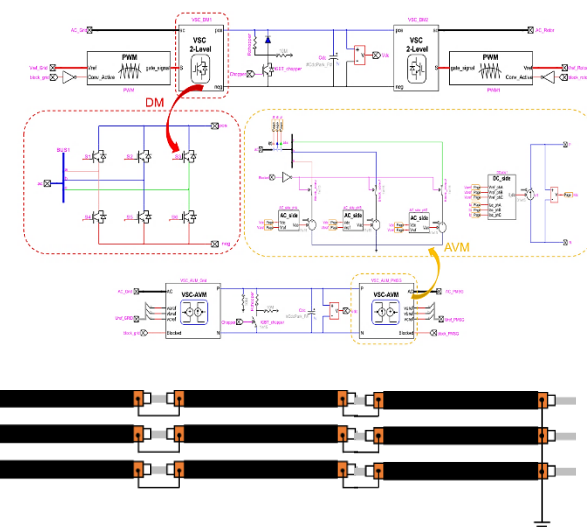
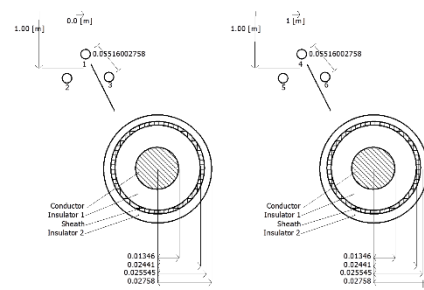
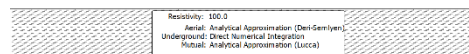
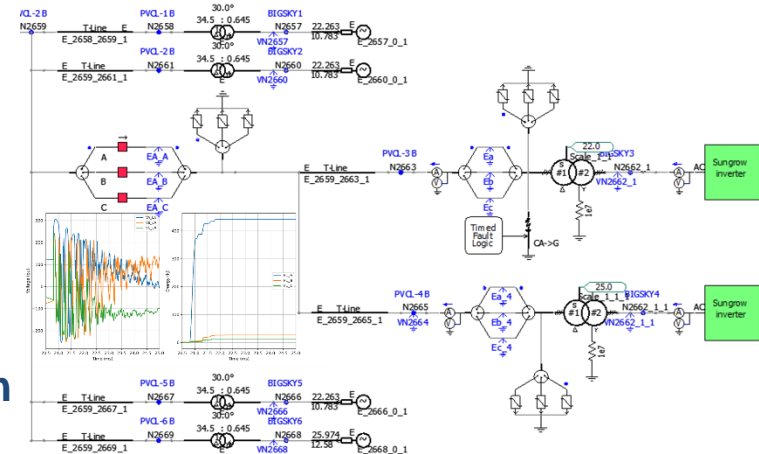
- IBRs
  - Wind
  - Solar
  - BESS
- SVC
- STATCOM
- FACTS
- HVDC

### MV/LV Application

- Ferroresonance
- TOV
- Fault Induced Voltages
- Insulation Coordination
- TRV (Breakers)
- Harmonics
- Reactor Sizing (Lines-Capacitor)
- Post-mortem analysis
- Inrush and POW

### Real Time Simulation

- P&C response





## Industrial and Commercial

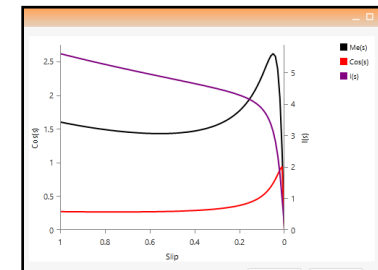
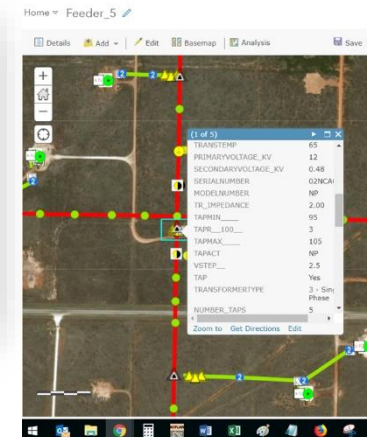
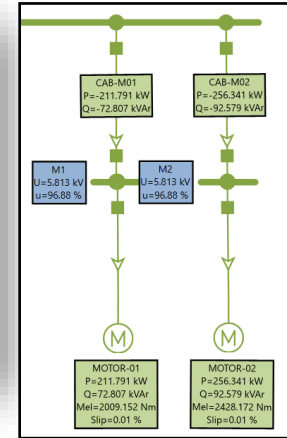
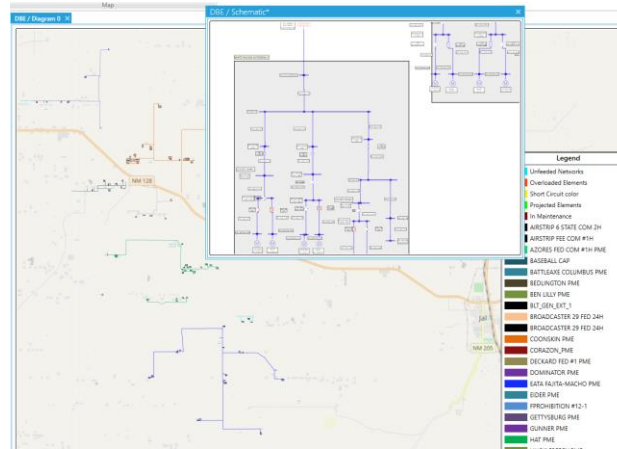
- Power Flow
- Fault Analysis
- Protection Coordination Studies
- Arc Flash Analysis
- Power Factor Correction
- Motor starting
- Preventive Maintenance

## Power Quality

- PQ measurement analysis
- Harmonic analysis
- Filter design
- Grounding systems verification and design

## Oil & Gas

- Information gathering
- GIS & Assets DB
- NFPA compliance



# SUBSTATION & HV/MV LINE DESIGN PROTECTION AND CONTROL DESIGN

# GERS

## Substation Design (Up to 500 kV)

- Physical Layout of Site
- Site Plans
- Structural Design
- Ducts and Trenches
- Grounding Mat
- Civil Foundations
- Shielding
- AC & DC Auxiliary Services
- Schematic Diagrams
- Wiring Diagrams
- Outdoor and Indoor Lighting

## HV/MV Overhead Line Designs

- Conductor Selection
- Line Route Survey
- Tower Spotting
- Overhead Line Lightning Shielding
- Civil Foundations
- Mechanical Stress
- Power Poles
- Right Of Way Compliance

## Device and Equipment Specifications

- Protective devices
- Remote Terminal Units (RTUs)
- Relay and Substation Networks
- Metering Systems
- Transformer, circuit breakers and lines/feeders monitoring

## Protection and Relaying Design

- One-line diagrams
- Three-line diagrams
- DC Schematics
- Control logic
- I/O mapping
- Point to point wiring schedules
- Control panel layout for protective devices

## Substation Automation Design

- Substation communications for remote operation and control
- Telemetry
- IED network
- Smart meters
- Local and remote monitoring



### Power Transformers

- DC insulation
- AC insulation (power factor or high potential)
- Windings resistance
- Turns Ratio Test (TTR)
- Commissioning of tap changer controllers
- Testing and commissioning of Voltage Regulators
- Functional Testing
- Partial Discharge Testing

### Generation, Industrial and Commercial Facilities

- Generators and Motors Testing
- Power Factor
- Exciters, Power System Stabilizers (PSS) and AVR's
- Motor control systems
- Adjustable-speed drive systems
- Winding resistance Insulation
- Partial Discharge

### Power Quality

- Testing of metering devices
- Revenue meters testing
- Audit of energy meters
- Harmonic metering and analysis

### Substation and Switchgear Equipment (High, Medium and Low Voltage)

- High and medium voltage circuit breakers static and dynamic testing
- Cables testing
- Disconnecting switches
- Current transformers
- Potential transformers
- Low voltage circuit breakers testing
- Surge arresters
- Capacitors and reactors
- Frequency response analysis FRA
- DC systems including batteries, chargers and UPS.
- Busbars
- Automatic circuit reclosers and line sectionalizers
- Substation Automation (IEC 61850)
- Communication protocols (Modbus, DNP)
- Measurement of grounding mats including step and touch voltage





# FIELD SERVICES

## Automation & Control

# GERS

### Control Automation of Industrial and Electrical Systems

- Engineering and design
- SCADA
- RTU configurations
- Communication protocols
  - DNP3
  - IEC61850
- Gateway & Switches configurations
- CID testing



### Protection & Control

- Protective devices set-up including operational logic
- Testing and calibration of protective devices
- Logic testing
- SCADA control circuit test, including communication checks
- Functional tests and support for startup
- Testing of transmission, distribution and generation protection schemes
- As-built documentation
- On-site training





- Inspection and testing of medium voltage feeder cables.
- Cleaning, Testing and Inspection of Power Transformers
- Inspection and insulation resistance on low voltage feeder cables.
- Cleaning, service and testing on medium and low voltage circuit breakers.
- Cleaning, service and testing on fused disconnect switches.
- Inspection and testing of medium and low voltage Switchgears and MCCs.
- Relays and meters testing







# FIELD SERVICES

## MODEL VALIDATION OF GENERATION PLANTS

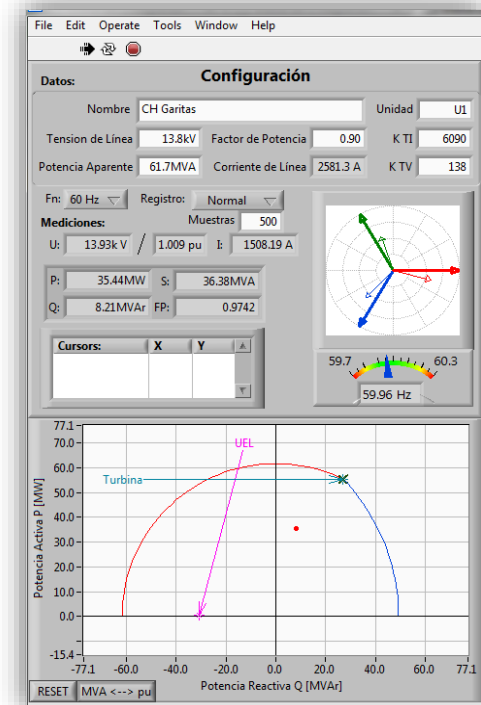
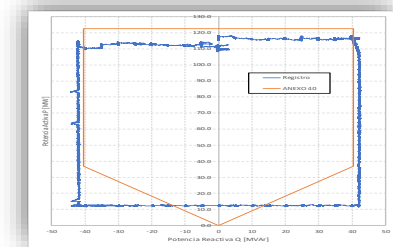
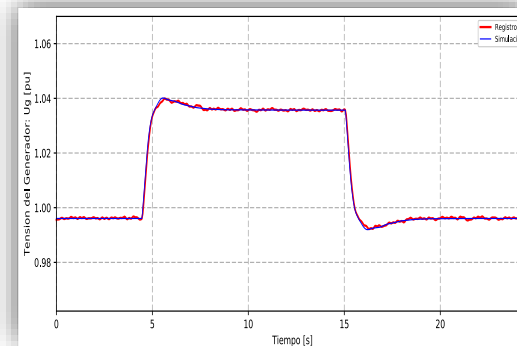
# GERS

### Staged Testing

- Capability curve verification (MOD-025)
- Ramp limit calculation
- Staged test on generation units or on the whole plant
- Adjust protection system settings
- Staged test and validation of overexcitation and under excitation limits, V/Hz and power system stabilizer (PSS)
- Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions through staged tests (MOD-026)
- Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions through staged tests (MOD-027)
- Real time monitoring of relevant variables through specialized hardware and software
- Tests are coordinated with the transmission operator in order to minimize the impact on the network
- Energy quality measurements (flicker, harmonics) and computation of quality indices.
- Elaboration of preliminary and final report

### Dynamic Model Validation

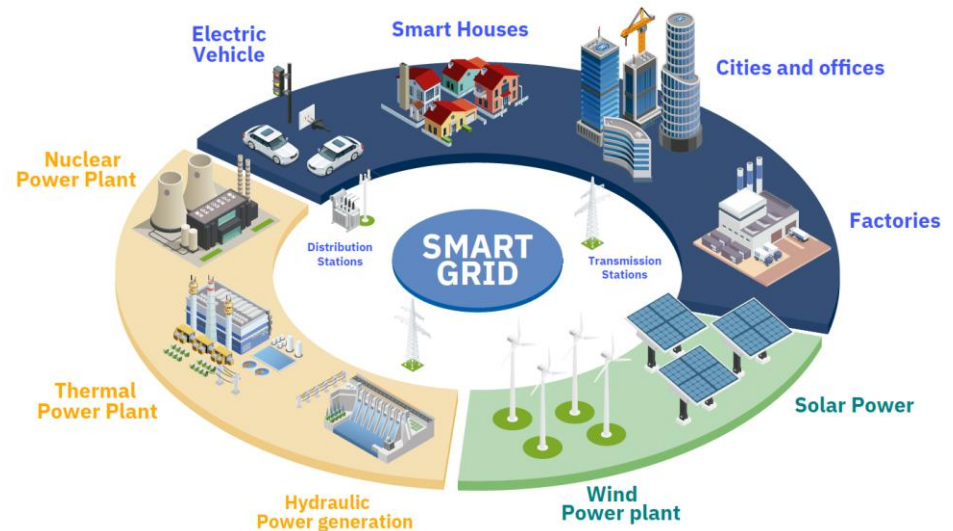
- Development of PSS/E, DigSilent, Power Factory, DSA Tools and MATLAB models.
- Playback simulation of the staged test
- Modeling of special components (shared pipelines, recovery boilers)
- Complete model documentation in block diagrams
- Development of flexible and robust models in order to facilitate future adaptations
- Model adaptation to the system database



Distribution systems are receiving increasing attention around the world, with considerable investments being poured into them. They are responsible for the service quality and primary losses of electrical systems.

The Smart Grid Studies we develop include the following:

- Renewables and DERs
- GIS
- Integration with PSATs
- SGMM
- Volt/Var Management Systems
- Feeder reconfiguration
- AMI/AMR





# POWER SYSTEM APPLICATION TOOL SUPPORT

# GERS

## Standard Modules

- Load Flow
- Load Profile Time Simulation
- Contingency Analysis
- Short Circuit Analysis
- Harmonic Analysis
- Motor Starting
- Calculation of Line Parameters
- Network Reduction
- Grounding System Analysis

## Stability Modules

- Voltage Stability
- Dynamic Stability—RMS/EMT
- Small Signal Stability

## Advanced Modules

- Reliability Analysis
- Reliability Centered Maintenance (RCM)
- Asset Management (Capex– Opex)

## NEPLAN as Tool for Research

- NPL- Neplan Programing Library
- Matlab—NEPLAN
- Research Package

## Optimization and Security Modules

- Optimal Load Flow, Contingencies N-1
- Available Transfer Capability Analysis (ATC)
- Optimal Distribution Network
- Reconfiguring of Distribution Network (Optimal Separation Points)
- Optimal Capacitor Placement
- Optimal Network Restoration Strategy
- Investment Analysis
- Feeder Reinforcement

## Protection Modules

- Overcurrent Protection (Selectivity Analysis)
- Distance Protection
- Fault Finding
- Arc Flash
- Current Transformer Saturation
- Cable Thermal Analysis



*NEPLAN is a tool for analysis, planning, optimization and operation of electrical, water, gas and heating networks.*

## NEPLAN 360

NEPLAN<sup>®</sup> 360 is the first fully browser-based power system analysis tool on the market and offers all advantages of cloud and intranet computing. The software does not need to be installed on a specific desktop computer or notebook, but is accessible through Login and Password everywhere through Intranet or Internet. The majority of commercially available browsers are supported, e.g. Explorer, Google Chrome, Safari, Mozilla Firefox. NEPLAN 360 is accessible through Web Services and allows therefore an easy integration with external GIS, SCADA, or Smart Grid application, which is a big advantage over a classical desktop solution. It can also access map servers which are used by the Geographical Information Systems (GIS), in order to display any map together with the network. The software therefore can have the function of a software service (SaS).

System Modeling, Load Flow, Short Circuit and Transient Analysis

Arc Flash Calculations and PPE specification

Transmission and Distribution System Protection

Generator and Transformer Protection

Relay Testing and Commissioning

Circuit Breaker Testing and Commissioning

Distribution Automation



## Generation Systems

- Solar Panels
- Wind Turbine
- Three Phase Inverter
- Single Phase Inverter
- Synchronous Generator
- Battery Energy Storage System

## Communication Protocols

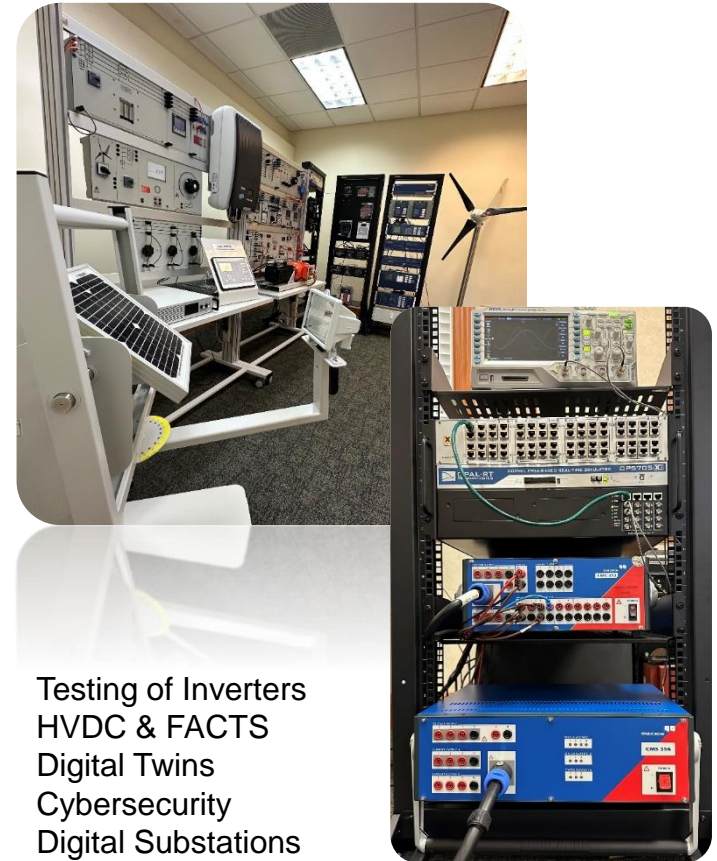
- IEC 61850 GOOSE / SV
- IEC 61850 MMS
- ANSI C37.118
- MODBUS
- DNP3

## Components

- Protection
- Automation
- Control
- Communication
- Real-Time Digital Simulation
- Microgrid

## Portfolio of Services

- Protection Schemes
- Hardware in the Loop
- Rapid Control Prototype
- Generator Controls
- WAMPAC Simulations
- Smart Grids & DERs
- Testing of Inverters
- HVDC & FACTS
- Digital Twins
- Cybersecurity
- Digital Substations







## SIGNATURE PROJECTS

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Power System Studies

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Design & Engineering

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Field Services

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Specialized Courses

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Comprehensive Projects

# GERS

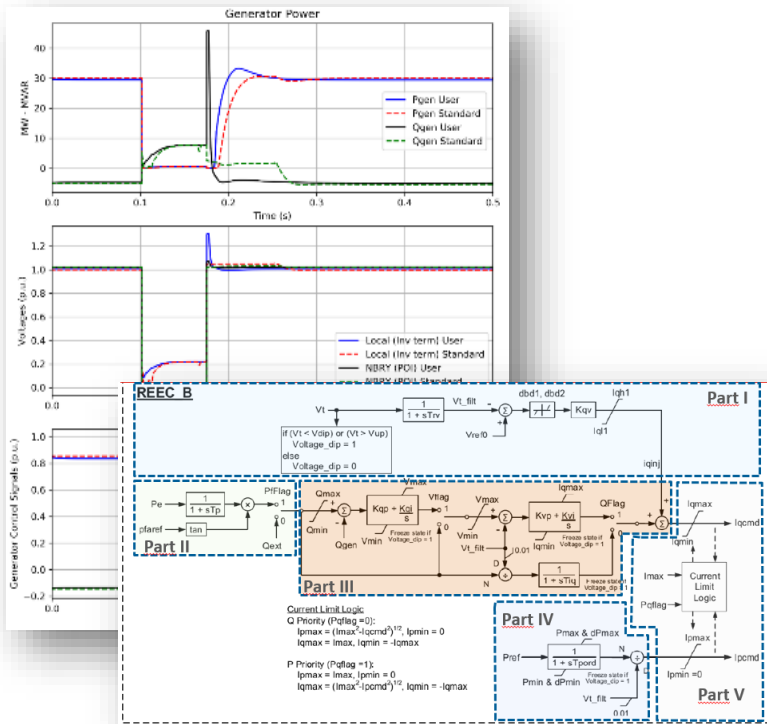


## SIGNATURE PROJECTS

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Power System Studies

## SYSTEM IMPACT STUDIES FOR PHOTOVOLTAIC SOLAR PLANTS



### SCOPE OF WORK

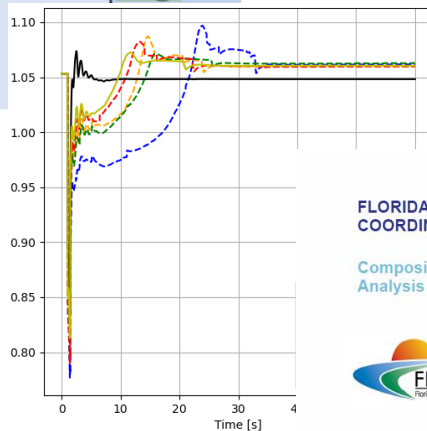
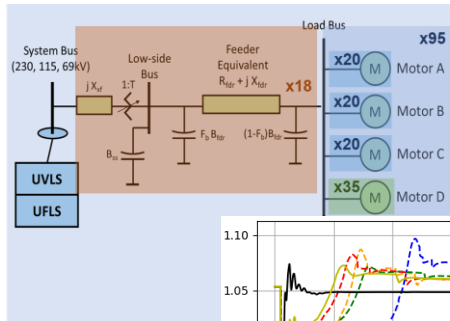
Provide power system Impact evaluation for more than 200 facilities (16GW) considering Network Resource Interconnection Service (NRIS) and Energy Resource Interconnection Service (ERIS).

### LOCATION

USA

### CUSTOMER

DUKE ENERGY



FLORIDA REALITY  
COORDINATING COUNCIL, INC

Composite Load Model Stability  
Analysis



Report  
Project no: MS-PL-411  
Revision: 1  
Date: Aug-23

**GERS**  
THE ENERGY THAT  
CONNECTS US

## POWER SYSTEM STUDIES

### SCOPE OF WORK

Composite Load Model Stability Analysis

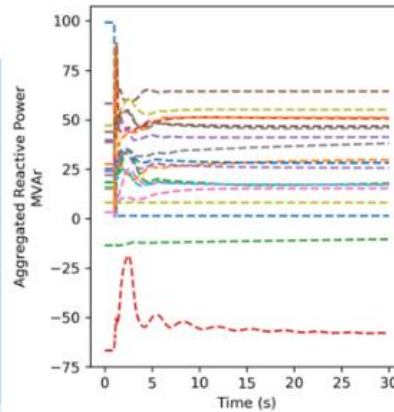
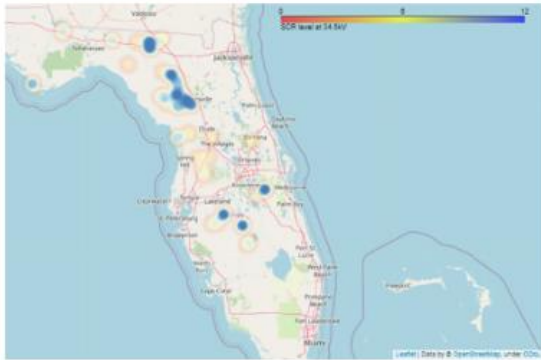
### LOCATION

USA

### CUSTOMER

FRCC - Florida Reliability Coordinating Council

## POWER SYSTEM STUDIES



### SCOPE OF WORK

Short-Circuit and Stability Electric Transmission Consulting Services.

### LOCATION

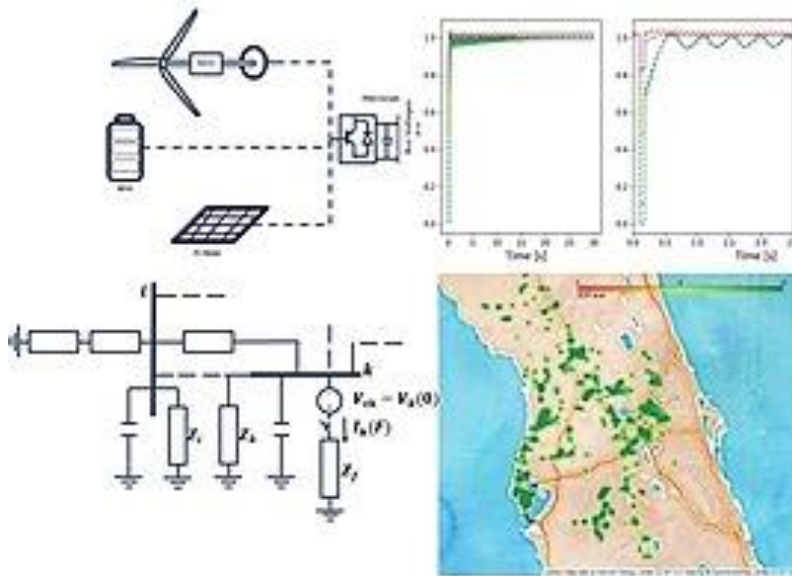
USA

### CUSTOMER

FRCC - Florida Reliability Coordinating Council



## POWER SYSTEM STUDIES



### SCOPE OF WORK

Power System Security and Control Study with High Inverter Based Resource Penetration.

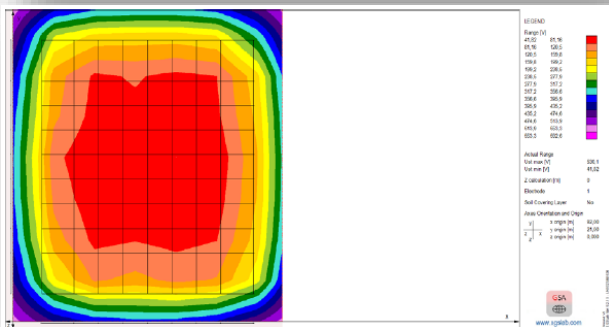
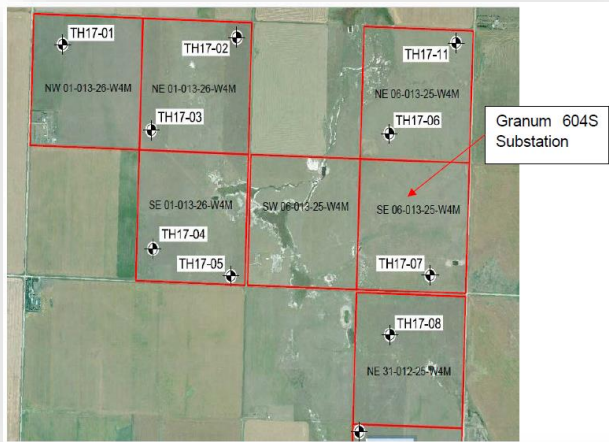
### LOCATION

USA

### CUSTOMER

TECO – Tampa Electric

## POWER SYSTEM STUDIES



### SCOPE OF WORK

EMT Analysis for switching and lightning studies at Granum substation.

### LOCATION

CANADA

### CUSTOMER

NORDEN ENERGY

## HARMONIC STUDY



### SCOPE OF WORK

Harmonic measurements to verify the operation of the main transformer associated with the electrical system at the 69 kV yard located in NW County Line St, Fort Meade.

### LOCATION

USA

### CUSTOMER

DUKE ENERGY

## SYSTEM IMPACT STUDIES FOR PHOTOVOLTAIC SOLAR PLANTS



### SCOPE OF WORK

- Perform steady state, short circuit and stability studies for Q27 /Q28 interconnection request.
- Perform a transient stability analysis to validate the existing MGS breaker failure clearing times and recommend any changes to ensure acceptable system performance.
- Affected System Impact Studies.
- Solar Interconnection Feasibility Studies.
- Solar Interconnection Feasibility Studies for photovoltaic solar plant with BESS.

### LOCATION

USA

### CUSTOMER

SEMINOLE

## ARPA – E GRID OPTIMIZATION



### SCOPE OF WORK

The activities developed during the project included:

- Created an adapter that convert power system real data to OPF formulation
- Created an algorithm that solve SCOPF problems in 10 minutes time frame
- Created a robust algorithm to solve small, medium and large and complex power grids
- Defined a tool to optimize the power dispatch with different generation technologies, scenarios and network topologies on the system
- Defined the operation cost for large and complex power grids.

LOCATION  
USA

CUSTOMER  
Advanced Research Projects Agency- Energy (ARPA-E)



## ELECTRICAL STUDIES FOR 138 KV GRANUM SUBSTATION



### SCOPE OF WORK

The activities developed during the project included: Protection Coordination, Grounding, Lightning, Insulation Coordination, and Short Circuit AC DC studies, Electromagnetic transient analysis for inrush current at the Power Transformer for Granum Substation, and update engineering for the grounding and lighting studies at Claresholm Solar Farm located in Alberta, Canada.

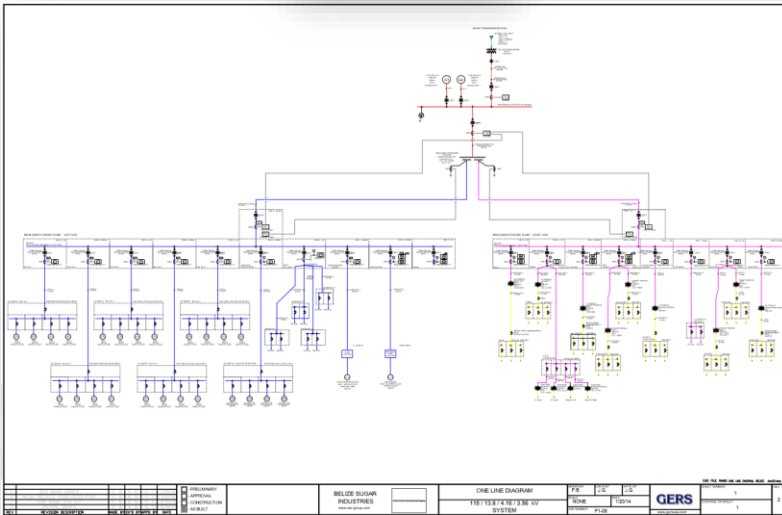
### LOCATION

CANADA

### CUSTOMER

NORDEN ENERGY

## POWER SYSTEM STUDY PROJECT



### SCOPE OF WORK

Load Flow, short circuit and coordination studies of the Belize Sugar Industries plant located in Belize.

### LOCATION

BELIZE

### CUSTOMER

BELIZE SUGAR INDUSTRIES



## POWER SYSTEM STUDY PROJECT

### SCOPE OF WORK

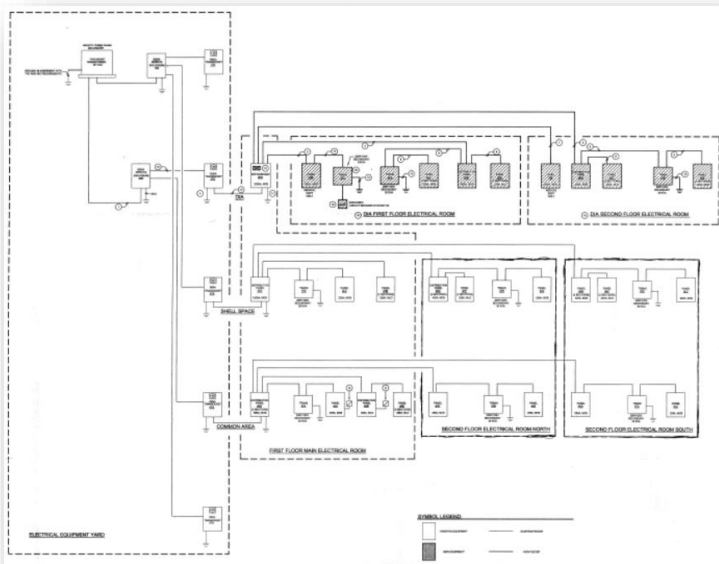
Protection Coordination Study for 733 circuit breakers and Arc flash study for 82 panels and bus bars for the Midland Memorial Hospital – MMH in Midland, Texas.

### LOCATION

Texas

### CUSTOMER

TESSCO



## VALIDATION OF GENERIC AND USER MODELS FOR PLANT CONTROLS AND INVERTERS IN PSS/E

### SCOPE OF WORK

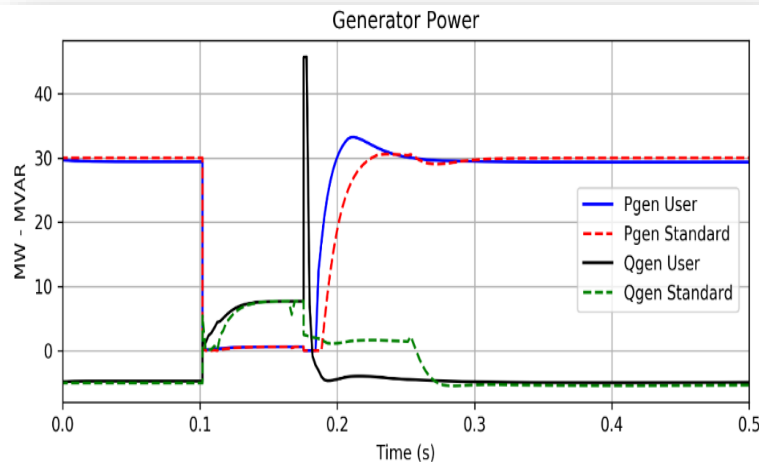
Validate and tune the response of the generic and user models of plant control elements and inverters of the Jalisco I Solar Farm IN PSSE/E software, in compliance with CENACE.

### LOCATION

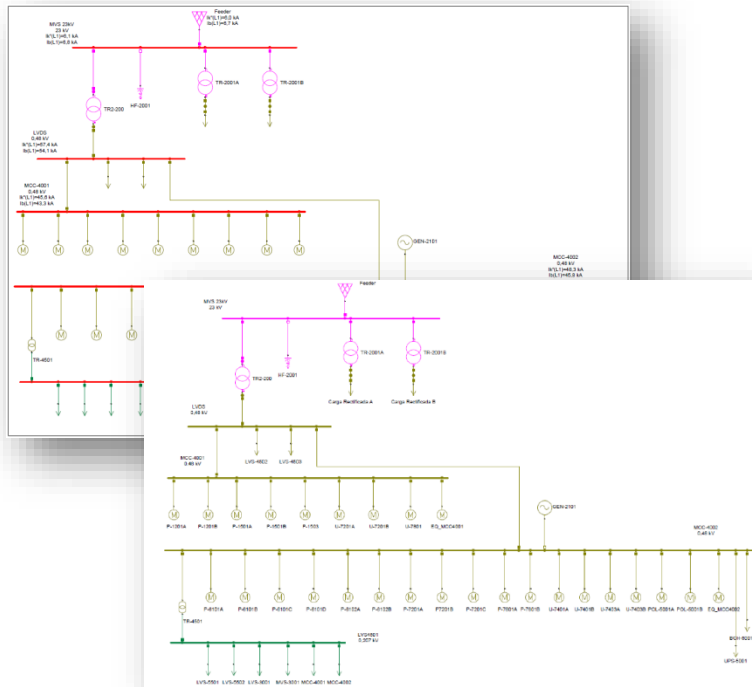
MEXICO

### CUSTOMER

ABB



## POWER SYSTEM STUDIES



### SCOPE OF WORK

- Short circuit Study and certify Single line Diagram for project Allied New Technologies 2 (ANT2).
- Perform the design review of the grounding system for the project Allied New Technologies 2 (ANT2).
- Factory Acceptance Test (FAT) Witnessing.

### LOCATION

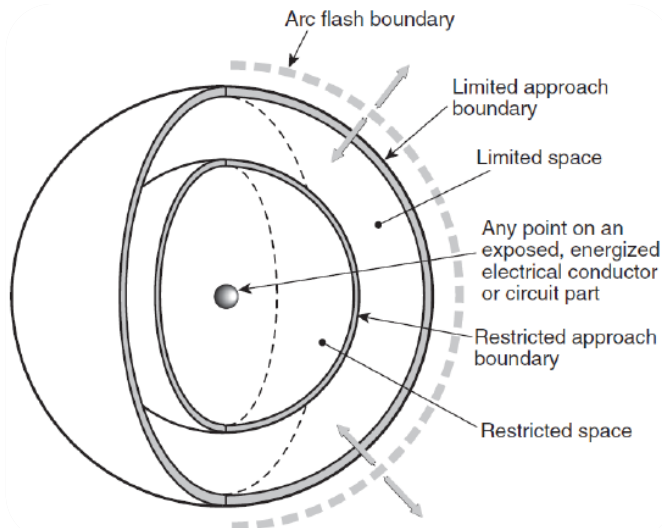
USA

### CUSTOMER

CONVE & SE INC



## ARC FLASH STUDY



### SCOPE OF WORK

- Modeling of the overall System in EasyPower, the calculation of short circuit levels for the maximum (systems running and connected to PREPA) and minimum (running in Island mode).
- Study of Arc Flash Hazard for 13.8, 6.9 and 0.48 kV switchgears, MCC's and panelboards installed in a co-generation facility in Puerto Rico.

### LOCATION

Puerto Rico

### CUSTOMER

AES



## GENERATOR / TRANSFORMER PROTECTION

### SCOPE OF WORK

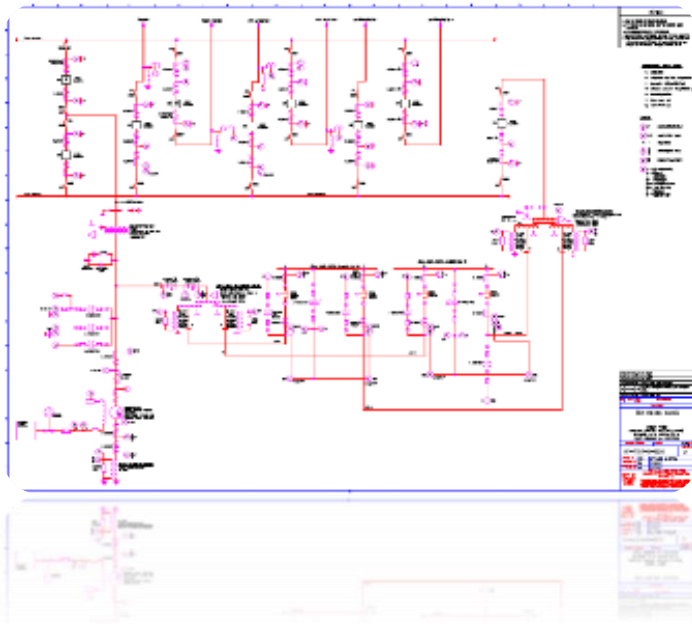
Generator/Transformer Protection Setting Calculation.

### LOCATION

- HelcoPower  
(Honolulu, HI, US). 2008
- ShearonHarris Nuclear Power Plant.  
(New Hill, North Carolina, US). 2010
- Coal Creek Station.  
(North Dakota, US). 2011
- Mountain Creek 650 MW.  
(Dallas, Texas, US). 2012
- Crystal River Nuclear Plant Unit 3  
(Crystal River, Florida, US). 2012

### CUSTOMER

Beckwith Electric



## NAPTIN POWER LOSS REDUCTION TECHNOLOGIES

### SCOPE OF WORK

- Reduce losses
- Improve EDC revenue performance
- Execute knowledge transfer
- Demonstrate potential for other 10 EDCs
- Maximize benefits from USTDA dollars

The utilities involved in this projects are the following:

- IKEJA EDC
- EKO EDC
- ABUJA EDC

### LOCATION

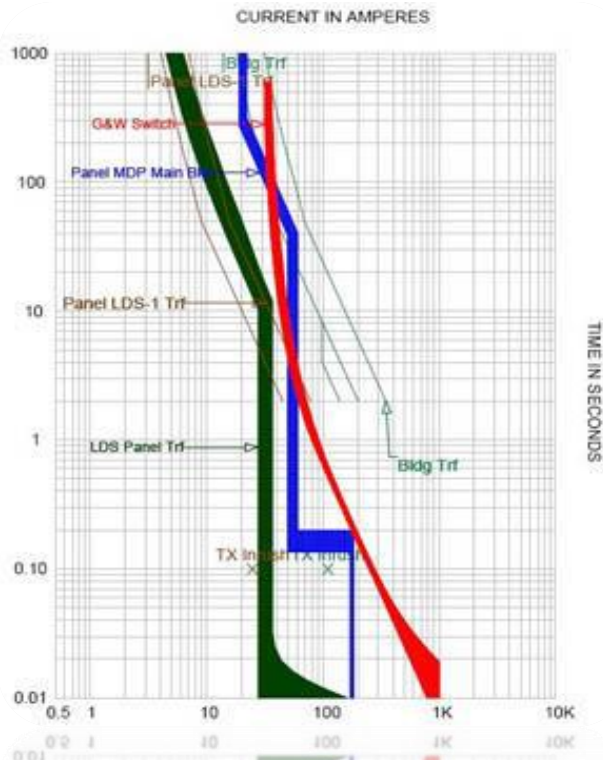
Abuja, Nigeria

### CUSTOMER

NAPTIN (National Power Training Institute of Nigeria) in conjunction with KEMA.



## LEESBURG 13 kV DISTRIBUTION COORDINATION



### SCOPE OF WORK

Coordination Study for 13 kV distribution system of Leesburg City.

### LOCATION

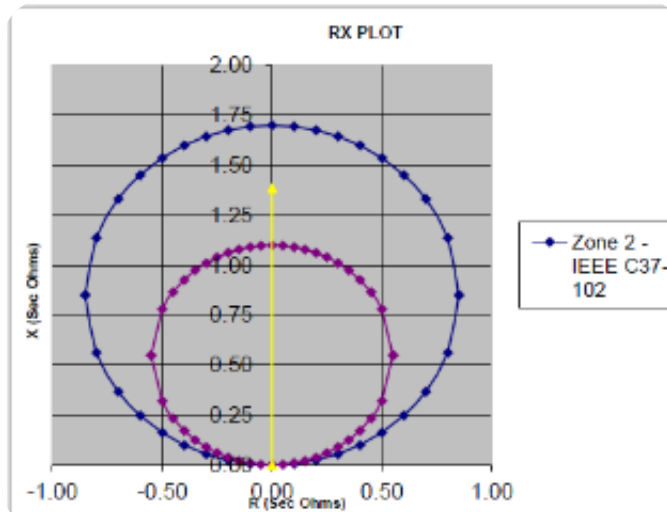
Leesburg, FL

### CUSTOMER

Power Grid Engineering



## PARALLELING CONTROL IMPLEMENTATION



### SCOPE OF WORK

Paralleling Control Implementation on Power Transformers.

### LOCATION

Valcor-Chiyoda Project  
(Puerto La Cruz, Venezuela)

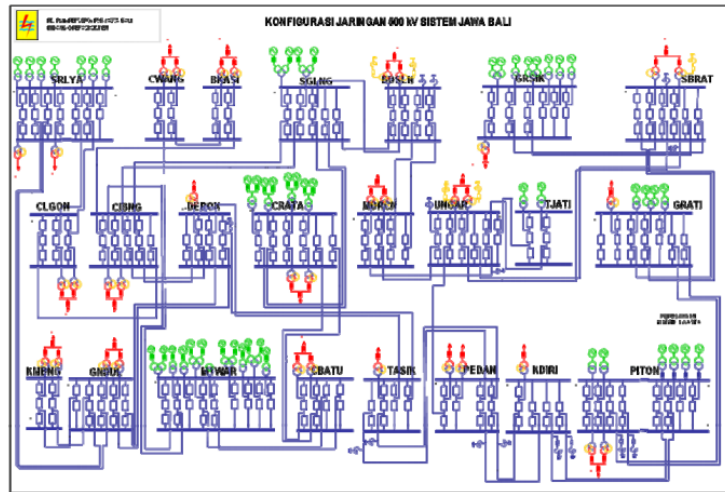
Bulyanhunlu Gold mine  
(Shinyanga, Tanzania)

Kensington Terminal Station  
(Buffalo, NY, US)

### CUSTOMER

Beckwith Electric

## INDONESIAN ELECTRICAL SYSTEM STUDIES



### SCOPE OF WORK

Load Flow - Short Circuit - Transient Stability- Voltage Stability - Contingency Analysis..

### LOCATION

Indonesia

### CUSTOMER

K&M Engineering and Consulting

# GERS



## SIGNATURE PROJECTS

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Design & Engineering

## PROTECTION AND CONTROL ENGINEERING FOR SAPELE SITE



### **SCOPE OF WORK**

Protection and Control Engineering 11 kV Sapele Power Barges, Phase 1 in Nigeria, Generators Side. The work includes electrical studies and protection systems designs and specifications.

### **LOCATION**

Sapele, Nigeria

### **CUSTOMER**

TURBINE TECHNOLOGIES

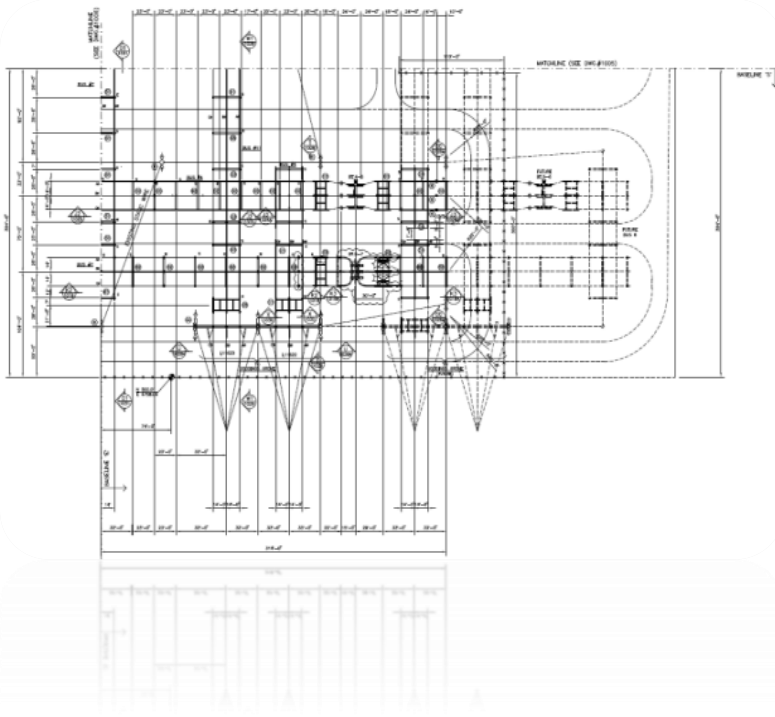
## ELECTRICAL DESIGN FOR ELWOD ENERGY CENTER 345KV

### SCOPE OF WORK

Design activities, such as elevation/section drawings, assembly drawings, grounding plan, conduit plan, grounding details, conduit details, bill of material, along with a protective relaying upgrade for Elwood Energy Center.

**LOCATION** Illinois

**CUSTOMER** Sargent & Lundy





## 345 KV PONTIAC SUBSTATION



### **SCOPE OF WORK**

P&C Design –Upgrade Line 2102N and 210S relaying and protective communications for Pontiac Substation.

**LOCATION** Illinois

**CUSTOMER** Sargent & Lundy

## PLANT HYPOCHLORITE CHEMICAL PLANT CONVE / ANT



### SCOPE OF WORK

- Conceptual and detailed design for the installation of a 23kV substation.
- Review engineering drawings and technical specifications of the 23 kV switchgear .
- Design of the grounding system and shielding protection against lightning.
- Witnessing the Factory Acceptance Tests (FAT) of the 23kV Metal Clad Switchgear at the AREVA facilities in Tizayuca, México.
- Protective device coordination study.
- Grounding inspection.

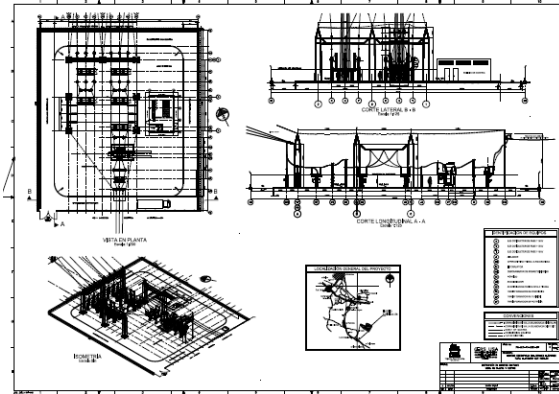
### LOCATION

Plant Hypochlorite Chemical Plant. Fort Pierce, FL

### CUSTOMER

CONVE / ANT





Layout as proposed in the conceptual engineering phase



Areal photograph showing the final construction

## SAN NICOLAS SUGAR MILL IPS CONSULTANTS

### SCOPE OF WORK

Conceptual Engineering study for San Nicolas sugar mill plant in including:

- Layout and Equipment requirements
- Preparation of bid documents
- Proposal evaluation
- Installation follow up until completion

### LOCATION

VERACRUZ, MEXICO

### CUSTOMER

IPS CONSULTANTS

## NEW HOPE POWER PLANT



### **SCOPE OF WORK**

Conceptual Engineering for connection of New Hope Power Plant to Okeelanta Sugar Mill. (Extension of the 132 /13.8 kV system)

### **LOCATION**

SOUTH BAY, FL

### **CUSTOMER**

FLORIDA CRYSTALS CORPORATION



## ENGINEERING AND DESIGN SERVICES

### SCOPE OF WORK

Engineering, detailed design and construction documents for the removal of an existing emergency generator set and the installation of a new one of higher power to the existing emergency electrical distribution system at the Winn Dixie stores.

### LOCATION

Big Pine Key, Boca Raton, Boynton Beach, Davie, Ft Pierce, Hallandale, Hollywood, Jupiter, Key Biscayne, Key Largo, Key West,, Loxahatchee, Marathon, Miami, Naples, Plantation, Pompano Beach, Riviera Beach, Royal Palm Beach, Stuart, Tamarac, Tavernier, West Palm Beach, Hialeah, Seminole, Dunedin, Land O Lakes, New Port Richey, Spring Hill, La Belle, Homosassa, Bushnell.

### CUSTOMER

PRESERVATION POWER



# GERS



## SIGNATURE PROJECTS

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Field Services





## FIELD SERVICES - QB2 PROJECT

### SCOPE OF WORK

Support high, medium, and low voltage electrical equipment with testing activities.  
Quebrada Blanca Phase 2 (QB2) Project.

### LOCATION

CHILE

### CUSTOMER

TECK/BECHTEL



## TESTING AND COMMISSIONING JOBS AT GARDEN OF EDEN POWER PLANT EXPANSION

### SCOPE OF WORK

Perform on site works related to testing and commissioning of the protection and control of the devices installed at panels 101, 102 and 103 in Garden of Eden 69 kV.

### LOCATION

Guyana

### CUSTOMER

EQUISALES



## FIELD SERVICES FOR THE CINA FACILITY

### SCOPE OF WORK

Support for mill motor starting and operation of the cement facility in Aubry.

### LOCATION

HAITI

### CUSTOMER

CIMENTERIE NATIONALE SEM

## FIELD SERVICES FOR BLUE HILLS POWER STATION

### SCOPE OF WORK

Provide Decons Energy with services for Blue Hills Power Station, including grounding and bonding system, testing and commissioning of relays and transformers, engineering modification, and a coordination study.

### LOCATION

BAHAMAS

### CUSTOMER

DECONS ENERGY



## FIELD SERVICES FOR THE ALMEX CO-GENERATION FACILITY



### SCOPE OF WORK

Provide ALMEX with engineering, supply, assembly, testing and commissioning of the required communication and measurement equipment to comply with the Network code requirements regarding the ICT's and measurement system at their Co-Generation Facility.

### LOCATION

MEXICO

### CUSTOMER

ALMEX



## TESTING & PERSONNEL SUPPLY FOR REFICAR PROJECT 1 X 25 MW POWER PLANT



### **SCOPE OF WORK**

Provide APR Energy with electrical testing works services for a 25MW power plant located at REFICAR located in Cartagena, Colombia.

### **LOCATION**

COLOMBIA

### **CUSTOMER**

APR



## ELECTRICAL TESTING SERVICES FOR EWSE PROJECT



### **SCOPE OF WORK**

Supply of personnel specialized in electrical tests, protections, and control, to carry out commissioning tasks of electrical equipment in Medium and Low Voltage for the ESCONDIDA WATER SUPPLY EXTENSION (EWSE) Project.

### **LOCATION**

CHILE

### **CUSTOMER**

BLACK & VEATCH

## ELECTRICAL TESTING SERVICES FOR THE PRE-COMMISSIONING OF THE EWSE PROJECT—COLOSO



### SCOPE OF WORK

Electrical tests, protections and control to carry out the pre-commissioning and commissioning tests of electrical equipment for high, medium, and low voltages in the Estacion Coloso and Proceso Substations for the ESCONDIDA WATER SUPPLY EXTENSION (EWSE) Project.

### LOCATION

CHILE

### CUSTOMER

CyD

## ELECTRICAL TESTING SERVICES (220/6.9kV) ESCONDIDA WATER SUPPLY EXTENSION (EWSE)



### SCOPE OF WORK

Supply of personnel specialized in electrical tests, protections, and control, to carry out pre-commissioning and commissioning tasks of electrical equipment in High, Medium, and Low Voltage, fiber optic systems, and fieldbus in the Farellón (HPPS2), Puri (HPPS3), and Chimborazo (HPPS4) electrical substations, and Pumping Stations HPPS2, HPPS3 and HPPS4 for the Project Escondida Water Supply Extension (EWSE).

### LOCATION

CHILE

### CUSTOMER

TECHINT



## Permian Electrical Distribution System Inventory Project

### SCOPE OF WORK

Provide Oxy with the Field Services to carry out an Electrical Distribution System Inventory and develop a comprehensive GIS model of the electrical infrastructure including active wells, substations, Satellites/Batteries and Recovery Plants of the of the Permian Basin operations located in West Texas and Southeast New Mexico.

### LOCATION

West Texas / New Mexico

### CUSTOMER

OXY



## TESTING OF GENERATOR PROTECTION RELAYS

### SCOPE OF WORK

Testing of generator protective devices in a power plant located at Carrollton, OH.

### LOCATION

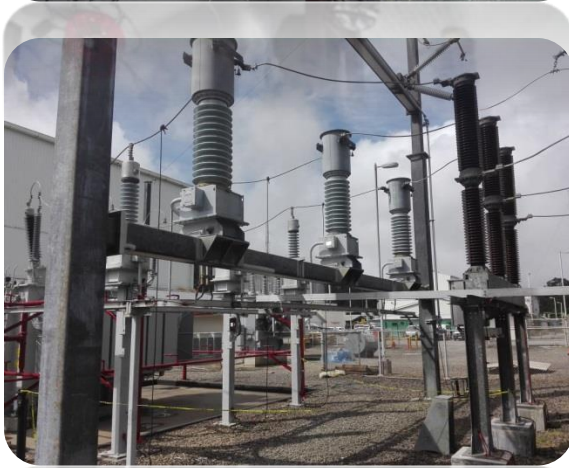
USA

### CUSTOMER

CE POWER







## TESTING AND COMMISSIONING SERVICES

### SCOPE OF WORK

Testing and Commissioning of one Beckwith M-3425A and two Beckwith M-3311A relays in a geothermal power plant in Mindanao, Philippines

### LOCATION

Philippines

### CUSTOMER

Beckwith Electric





## ELECTRICAL TESTING WORKS SERVICES

### SCOPE OF WORK

Testing and commissioning of electrical equipment associated with the 300 MW Power Plant located at Dhaka, Bangladesh.

### LOCATION

Bangladesh

### CUSTOMER

APR



## FACTORY ACCEPTANCE TEST (FAT) WITNESSING

### SCOPE OF WORK

Provide engineers to witness the Factory Acceptance Tests (FAT) for a Low Voltage Switchgear manufactured by EATON in Asheville, NC.

### LOCATION

Asheville, NC, USA

### CUSTOMER

CONVE & SE INC

## ELECTRICAL TESTING WORKS SERVICES



### SCOPE OF WORK

Electrical testing works services for a 25MW Power Plant Expansion, located at St. Thomas, US Virgin Islands.

### LOCATION

Virgin Islands

### CUSTOMER

APR

## ELECTRICAL TESTING WORKS SERVICES

### SCOPE OF WORK

Testing and Commissioning of protective devices and equipment associated for a 25MW power plant expansion located at St. Thomas, US Virgin Islands

### LOCATION

Virgin Islands

### CUSTOMER

APR





## ENGINEERING SERVICES MARIA GLETA BENIN PROJECT

### SCOPE OF WORK

Testing and Commissioning of protective devices and Equipment associated to Power transformers and Switchgears at 50MW power plant located at Cotonou, Benin.

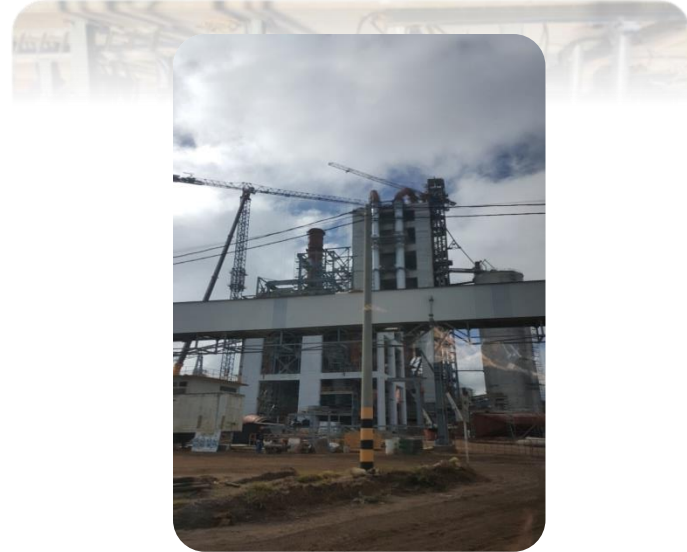
### LOCATION

Benin

### CUSTOMER

APR





## ENGINEERING SERVICES CEMENTOS PROGRESO PROJECT

### SCOPE OF WORK

Testing and Commissioning of protective devices and Equipment associated to Power transformers and Switchgears at 10 MW power plant located at San Gabriel, Guatemala.

### LOCATION

Guatemala

### CUSTOMER

APR



## Testing and Commissioning for SEL 700G Generator Protective Devices

### SCOPE OF WORK.

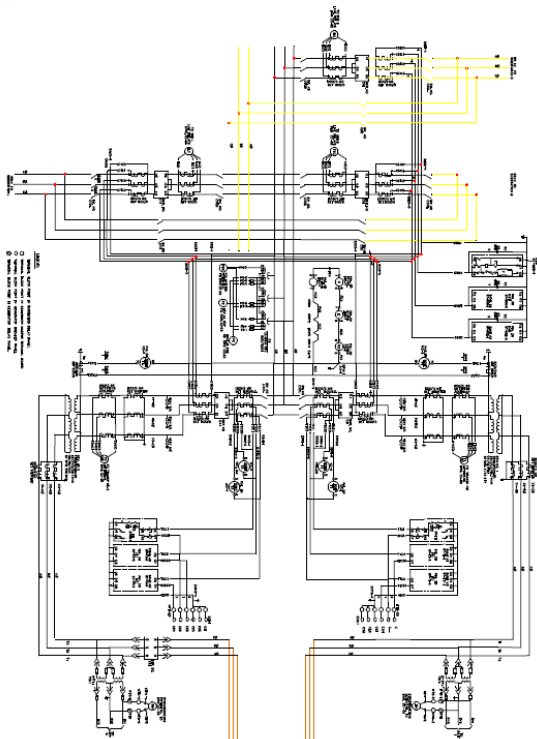
Testing and commissioning for the SEL 700G Generator protective device, Chillicothe Substation Energy Center.

### LOCATION

Missouri- USA

### CUSTOMER

TURBINE TECHNOLOGY



## Testing and Commissioning for SEL 700G Generator Protective Devices



### **SCOPE OF WORK**

- ✓ Testing and commissioning for the SEL 700G Generator protective devices associates to four Westinghouse W301 and Pratt & Whitney FT4s turbine-generation units in Yankee Substation.
- ✓ Testing and commissioning for the SEL 700G Generator protective device, Hutchings Substation 38,4 MW Unit 7.

### **LOCATION**

Ohio - USA

### **CUSTOMER**

TURBINE TECHNOLOGY



## TESTING AND COMMISSIONING – 72 MW GAS POWER PLANT

### SCOPE OF WORK

Testing and commissioning works of electrical protective systems were executed on Power Transformers, Current Transformers, Potential Transformers, Busbar, Insulated Power Cables, Disconnect and Earth Switches, Current and Voltage Injections to be installed at the 72 MW Gas Power Plant in Alexandria, Egypt.

### LOCATION

Egypt

### CUSTOMER

APR Energy



## ESCONDIDA WATER SUPPLY ( EWS )

### SCOPE OF WORK

Testing and commissioning of medium and High voltage electrical equipment at EWS Minera Escondida in Chile.

This Project is the biggest investment to increase the cooper production of Minera Escondida which is one of the largest open-pit mines in the world.

### LOCATION

Minera Escondida, operated by BHP Billiton.  
Antofagasta, Chile

### CUSTOMER

BECHTEL





## ORGANIC GROWTH PROJECT 1 ( OGP1 )

### SCOPE OF WORK

Testing of medium & high voltage equipment and associated protection and control devices. Pre-operational testing over 230 and 69, 33 kV GIS Substations and 13.8, 6.6, 4.16 and 0.48 kV electrical distribution rooms including switchgears, MCCs and Power Transformers.

This Project is the biggest investment to increase the copper production of Minera Escondida which is one of the largest open-pit mines in the world.

### LOCATION

Minera Escondida, operated by BHP Billiton.  
Antofagasta, Chile

### CUSTOMER

BECHTEL



## TESTING AND COMMISSIONING SERVICES FOR THE ELECTRICAL EQUIPMENT AND PROTECTION SYSTEM

### SCOPE OF WORK

Testing and Commissioning of protective devices and equipment associated to power transformers and switchgears at Del Sur Solar 25 MW Photovoltaic Plant.

### LOCATION

Honduras

### CUSTOMER

FIRST SOLAR INC





## OXIDE LEACH AREA PROJECT (OLAP)

### SCOPE OF WORK

Testing of medium & high voltage equipment and associated protection and control devices. Pre-operational testing of medium & high voltage equipment and associated protection and control devices. Pre-operational testing over 230 and 69, 33 kV GIS Substations and 13.8, 6.6, 4.16 and 0.48 kV at 23 electrical distribution rooms.

### LOCATION

Minera Escondida, operated by BHP Billiton  
Antofagasta, Chile

### CUSTOMER

BECHTEL

## HOLLAND STATION



### **SCOPE OF WORK**

Settings calculation for SEL relays at Holland Station in Michigan.

### **LOCATION**

Holland, Michigan

### **CUSTOMER**

Turbine Technology Services

## FP&L SUBSTATION SCHEME MODIFICATION



### SCOPE OF WORK

Testing and commissioning of Electrical protection devices. Setup of Digital Fault Recorders (DFR) and switches (RCPs) for relay networks that are communicated with FPL Control Center.

### LOCATION

Transmission Substations: Charlotte, Collier, Florida City  
Distribution Substations (Double Bus Outage Scheme Modification - DBOS): Auburn, Jet Port, Miami Lakes, Park, Rotonda, St. Joe, Deltona, Taylor, Brevard, Duval, and McGregor.

### CUSTOMER

Power Grid Engineering

## ANTAPACCAY PROJECT –TINTAYA EXPANSION



### SCOPE OF WORK

Testing of medium voltage equipment and associated protection and control devices. The works were performed in several electrical distribution rooms and one GIS 230 kV Substation.

### LOCATION

Antapaccay, Peru

### CUSTOMER

BECHTEL

## UNIVERSITY OF FLORIDA SCADA UPDATE

### **SCOPE OF WORK**

Testing and commissioning of Electrical protection devices located at 5 and 13.8 kV Distribution Substations 5, 6, 10, 11, 12 and 13 inside UF Campus.

### **LOCATION**

Gainesville, FL

### **CUSTOMER**

Power Grid Engineering





## BURKINA FASO 15 MW GENERATION PLANT



### **SCOPE OF WORK**

Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### **LOCATION**

Ouagadougou, Burkina Faso

### **CUSTOMER**

APR

## CAP DE BICHES 50 MW GENERATION PLANT



### **SCOPE OF WORK**

Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### **LOCATION**

Dakar, Senegal

### **CUSTOMER**

APR Energy

## KOUNOUNE 50 MW GENERATION PLANT



### **SCOPE OF WORK**

Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### **LOCATION**

Kounoune, Dakar, Senegal

### **CUSTOMER**

APR Energy

## CURACAO SINGLE CYCLE BARGE



### **SCOPE OF WORK**

Testing and Commissioning of electrical protection system, power transformer, generator and exciter.

### **LOCATION**

Curacao

### **CUSTOMER**

Turbine Technology Services

## DAURA GENERATING STATION UNIT 5 AND 6 GENERATOR AND TRANSFORMER PROTECTIONS TEST BUS TRANSFER TEST



### SCOPE OF WORK

Testing in generator protection Beckwith M-3425A, transformer protection Beckwith M-3311 and distance protection Beckwith M-3520. Motor Bus Transfer MV commissioning was also included. Functional test and synchronization of the Units 5 & 6 to the HV Iraqi Electrical System.

### LOCATION

Baghdad, Iraq

### CUSTOMER

BECHTEL



## LOS PELAMBRES COPPER MINE -REPOWERING II

### SCOPE OF WORK

Testing of medium voltage equipment and associated protection and control devices. Pre-operational test of protective devices, metering and power equipment at medium voltage. The equipment was installed at 15 electrical distribution substations at 6 different geographical places within the Mine.

### LOCATION

Salamanca (Los Pelambres), Chile

### CUSTOMER

BECHTEL



## PETROBRAS - REFAP PROJECT



### SCOPE OF WORK

- Commissioning activities at Petrobras Oil Refinery Alberto Pasqualini.
- Supervision and support during energization of all systems.
- SCADA testing.

### LOCATION

Canoas, Rio Grande do Sul, Brazil

### CUSTOMER

BECHTEL / Petrobras

## SPALDING ENERGY POWER PLANT (2 x 305 MW + 1 x 435 MW)



### SCOPE OF WORK

Test, commissioning and calibration works for power transformers, instrument transformers, meters and relays at Spalding Energy Power Project. Combined cycle including 2 x 305 MW Combustion Turbine Generators and 1 x 435 MW Steam turbine generator connected at 420 kV National Grid through 3 Step up transformers. Balance of Plant electrical equipment were also commissioned.

### LOCATION

Spalding, England

### CUSTOMER

BECHTEL

## ARAUCARIA POWER PLANT (3 x 200 MW)



### **SCOPE OF WORK**

Testing and commissioning of Electrical protection devices associated to 2 x 200 MW Combustion Turbine Generators and to 1 x 200 MW Steam Turbine Generator. The Power Plant is connected to the South Brazilian Grid at 138 kV through 3 step up transformers. Balance of Plant equipment was also commissioned.

### **LOCATION**

Araucaria, Paraná, Brazil.

### **CUSTOMER**

BECHTEL

## SIDI KRIR POWER PLANT



### **SCOPE OF WORK**

Testing of protection and control and metering devices associated to the Step up and Auxiliary Power Transformers and balance of plant medium and low voltage.

### **LOCATION**

Alexandria, Egypt

### **CUSTOMER**

BECHTEL



## TERMOEMCALI 280 MW COMBINED CYCLE PLANT



### SCOPE OF WORK

- Connection study.
- Testing and commissioning of the electrical and instrumental Systems.

### LOCATION

Cali, Colombia

### CUSTOMER

Intergen/BECHTEL

## CERRO MATOSO / URABA EXPANSION DESIGN



### **SCOPE OF WORK**

Design for Cerro Matoso 500/230 kV Expansion and Uraba 230kV construction.

### **LOCATION**

Colombia

### **CUSTOMER**

Interconexión Eléctrica-ISA

# GERS



## SIGNATURE PROJECTS

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Comprehensive  
Projects

## GIS PROJECT



### SCOPE OF WORK

Arc Flash and Electrical System Modeling Heritage Concho and ConocoPhillips Assets for both Midland and Delaware Basins.

### LOCATION

USA - Texas

### CUSTOMER

ConocoPhillips

## FIELD SERVICES FOR CO-GENERATION FACILITY

### SCOPE OF WORK

Provide Florida Crystals Corporation with services at their Co-Generation Facility including settings calculations, design, installation, testing and commissioning of relays, electrical preventative maintenance and testing services for transformers, field assistance and troubleshooting of the electrical system.

### LOCATION

USA - Florida

### CUSTOMER

Florida Crystals







## STUDIES, DESIGN, AND TESTING AND COMMISSIONING IN A POWER PLANT

### SCOPE OF WORK

Short Circuit, Settings calculation, Engineering design and Testing and Commissioning – 10 MW Diesel Moawo power plant located in Nias, Indonesia.

### LOCATION

Nias, Indonesia

### CUSTOMER

APR Energy



## BELIZE SUGAR INDUSTRIES – ROUTINE TESTING - TTR, WINDING RESISTANCE AND INSULATION RESISTANCE

### SCOPE OF WORK

- ✓ Arc Flash Hazard Study and Training
- ✓ Power Transformers Testing
- ✓ Battery Load Test

### LOCATION

Belize

### CUSTOMER

BELIZE SUGAR INDUSTRIES



## ESMERALDAS REFINERY - COORDINATION STUDY - TESTING AND COMMISSIONING



### SCOPE OF WORK

- Field Assessment at Esmeraldas Refinery
- Protective Device Coordination Study for Field work on the protection system of the EPP Facility.
- Electrical system modeling training.
- Analysis and Frequency Relay Settings.

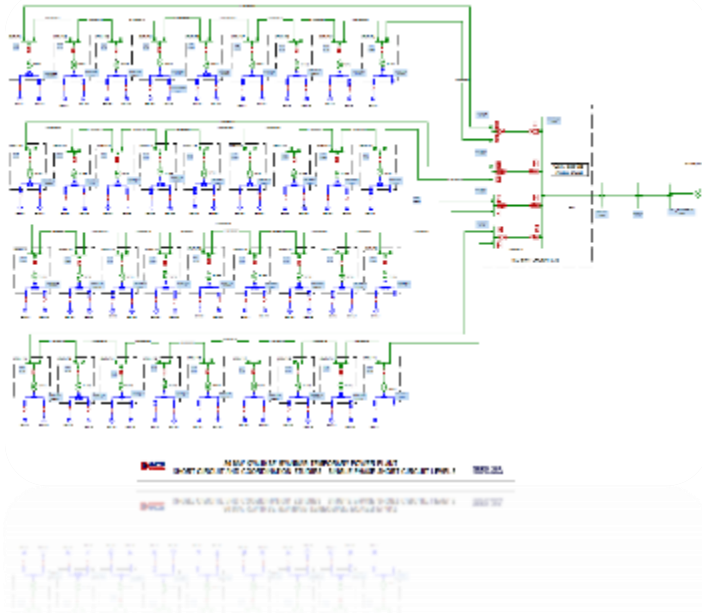
### LOCATION

Petro Ecuador Esmeraldas Refinery  
Ecuador

### CUSTOMER

KBC Advance Technologies

## MYANMAR 82 MW TEMPORARY GENERATION



### SCOPE OF WORK

Design, Studies, and Testing and Commissioning activities at four temporary generation plants

### LOCATION

Kyaukse, Myanmar

### CUSTOMER

APR Energy

## LYBIA 450 MW GENERATION PROJECTS



### **SCOPE OF WORK**

Design, Studies and Testing and Commissioning activities for 450 MW power plants installed in Lybia. The 450 MW are split in six temporary generation plants. Voltage levels: 0.4, 11.5, 30 and 66 kV.

### **LOCATION**

Al Furnag, Al Khoms, Samnu, Zliten, Birmilad and Um Al Djadawel.

### **CUSTOMER**

APR Energy

## BIR USTA MILAD 100 MW GENERATION PLANT



### **SCOPE OF WORK**

Engineering Design, Studies, and Testing and Commissioning activities of generation plant.

### **LOCATION**

Bir Usta Milad, Libya

### **CUSTOMER**

APR Energy



## UM AL DJADAWIL 100 MW GENERATION PLANT

### SCOPE OF WORK

Engineering Design, Studies, and Testing and Commissioning activities of generation plant.

### LOCATION

Um Al Djadawil, Libya

### CUSTOMER

APR Energy



## PADANG 40 MW POWER PLANT



### SCOPE OF WORK

Engineering Design, Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### LOCATION

Padang, Sumatra Island, Indonesia

### CUSTOMER

APR Energy

## MEDAN 70 MW POWER PLANTS



### **SCOPE OF WORK**

Engineering Design, Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### **LOCATION**

Medan, Sumatra Island, Indonesia

### **CUSTOMER**

APR Energy

## SUR OMAN POWER PLANT



### SCOPE OF WORK

Engineering Design, Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### LOCATION

Sur, Oman

### CUSTOMER

APR Energy

## 40 MW MALI POWER PLANT



### **SCOPE OF WORK**

Engineering Design, Short Circuit and Protection coordination studies. Testing & Commissioning activities.

### **LOCATION**

Cap de Biches, Senegal/Mali.

### **CUSTOMER**

APR Energy

## MAGDALENA STABILITY STUDIES

### SCOPE OF WORK

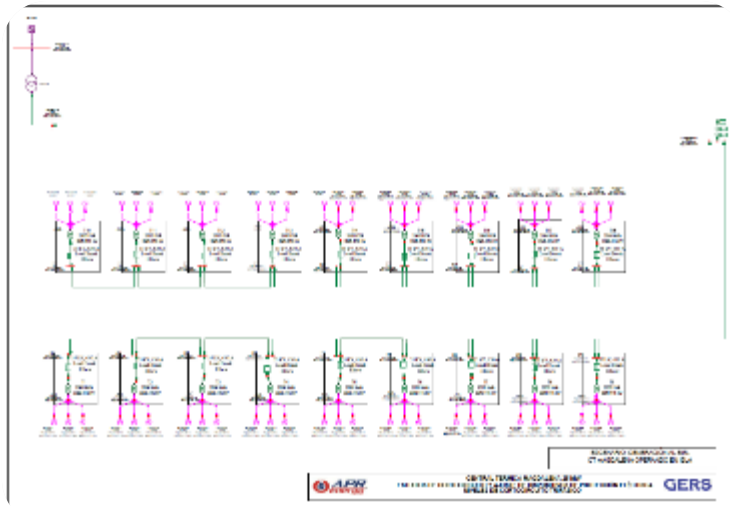
Short Circuit, Coordination, Stability Studies. Commissioning Activities

### LOCATION

Magdalena, Argentina

### CUSTOMER

APR Energy





## Engineering Services



### SCOPE OF WORK

Three major activities accomplished for the 235 MW combined cycle power plant of TermoEmcali in Colombia:

- Complete design of the 115 kV switchyard to receive the total generation of the plant;
- Testing and commissioning of the overall control and protective equipment associated to both, the plant and the substation;
- Warranty management and handover to the local utility.

### LOCATION

CALI, COLOMBIA

### CUSTOMER

Termo Emcali – Bechtel

# GERS



## SIGNATURE PROJECTS

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Specialized Courses

## COURSE



### **SCOPE OF WORK**

Smart Grid Maturity Model Course

### **LOCATION**

San Jose - Costa Rica

### **CUSTOMER**

CECACIER

## COURSES



### **SCOPE OF WORK**

Distribution Automation course

### **LOCATION**

Pennsylvania - USA

### **CUSTOMER**

The Pennsylvania State University

## NAPTIN POWER LOSSES REDUCTION TECHNOLOGIES

### SCOPE OF WORK

Review and training on the current Distribution System and applicable power losses reduction methodologies to National Power Training Institute of Nigeria (NAPTIN).

The utilities involved in this projects are the following:

- IKEJA EDC
- EKO EDC
- ABUJA EDC

### LOCATION

Abuja, Nigeria

### CUSTOMER

NAPTIN (National Power Training Institute of Nigeria) in conjunction with KEMA





## COURSE



### SCOPE OF WORK

- ✓ Transformers protection
- ✓ Distribution system protection
- ✓ Generator Protection

### LOCATION

Quito - Ecuador

### CUSTOMER

KEDE Consulting S.A.



## COURSES



### **SCOPE OF WORK**

Automation and Analysis of Distribution Systems course

### **LOCATION**

Bangkok - Thailand

### **CUSTOMER**

The Pennsylvania State University

**Manufacturer/OEM**

ABB  
BASLER  
BECKWITH  
SCHNEIDER ELECTRIC  
SIEMENS

**Utilities**

AES  
CELSIA  
CFE  
CODENSA  
DUKE ENERGY  
EDEA  
ENSA  
EPM  
ETESA  
EXELON  
FLORIDA POWER & LIGHT  
GREAT RIVER ENERGY  
INTERGEN  
ISA  
ISAGEN  
PETROECUADOR  
POWER GEN –  
TRINIDAD & TOBAGO  
PREPA / KEMA  
PUNTA GORDA CITY

SEMINOLE  
TAMPA ELECTRIC  
COMPANY  
TRELEC-GUATEMALA

**Industrials**

ALLIED UNIVERSAL  
CORPORATION  
ALMEX  
BAXTER  
BELIZE SUGAR INDUSTRIES  
CECACIER  
CEMEX  
CIBAO CEMENTS  
COCA COLA  
CODELCO  
COLGATE  
CONOCOPHILLIPS  
CONVE & AVS  
FIRST SOLAR INC.  
FLORIDA CRYSTALS  
JOHNSON & JOHNSON  
KIMBERLY CLARK  
MOTOROLA  
NEW HOPE POWER PLANT  
OLADE  
OPTIMUS STEEL  
PACASMAYO CEMENTS

PANAMA CEMENT  
SMURFIT KAPPA  
TARMAC CEMENT PLANT  
TITAN AMERICA  
TOYOTA / ALL STATE  
UNILEVER  
WINN-DIXIE / PRESERVATION  
POWER

**Engineering Company**

APR ENERGY  
AVO TRAINING INSTITUTE  
BECHTEL  
BLACK & VEATCH  
C Y D  
CDM SMITH INC.  
CE POWER  
EQUISALES  
FELGUERA M & M  
ITS ENGINEERING  
K&M ENGINEERING AND  
CONSULTING LLC  
KBC ADVANCED  
TECHNOLOGIES  
KEDE CONSULTING  
KEMA INC.  
MIAMI SWITCHGEAR  
MOMPRESA  
NORDEN ENERGY

POWER GRID ENGINEERING  
QUANTAM LAKE POWER  
SARGENT & LUNDY  
SOLDEV  
TECHINT  
TECK  
TOPAZ POWER GROUP  
TUATARA GROUP  
TURBINE CONTROLS &  
EXCITATION GROUP  
TURBINE TECHNOLOGY SERVICES  
WOOD GROUP POWER SOLUTIONS

**Government Entities**

ARPA-E - US DEPARTMENT OF ENERGY  
FRCC  
MEER - ECUADOR  
MINISTRY OF MINES AND ENERGY -  
COLOMBIA  
US ARMY CORPS OF ENGINEERS

**Universities**

FLORIDA INTERNATIONAL UNIVERSITY  
UNIVERSITY OF FLORIDA  
UNIVERSITY OF GONZAGA  
UNIVERSITY OF PENNSYLVANIA