Contents

- SCADA Overview
- Platform
- ClearView
- OPC Server & Drivers

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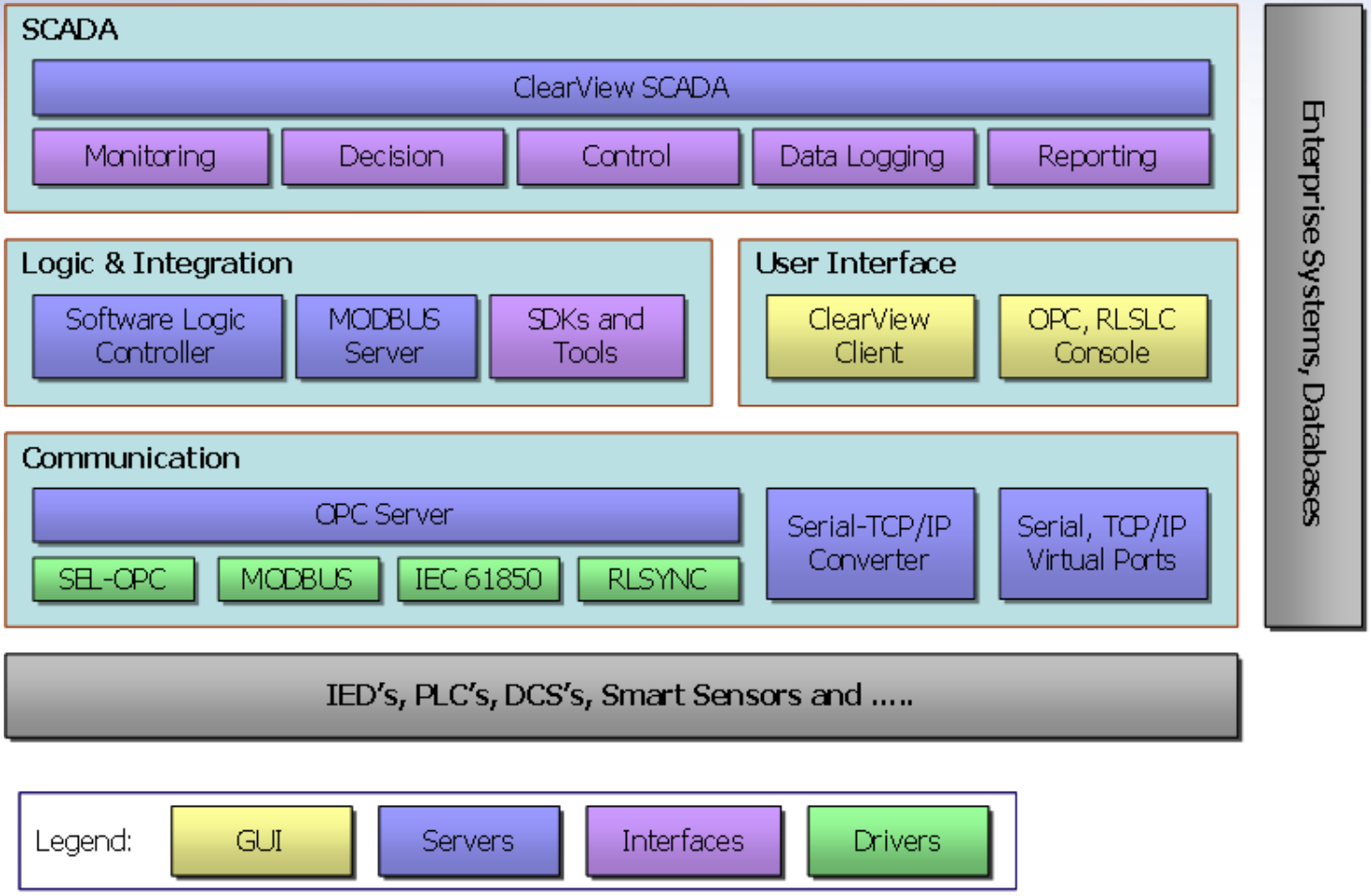
ReLab Software Platform



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ReLab Platform

- Foundation for all ReLab Solutions
- Flexible and customizable
- Areas
  - Communication
  - Integration
  - Supervisory Control & Data Acquisition
  - Data Collection and Analysis
  - Visualization

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Use Cases

- Distribution Substations
- Transmission Substations
- Generation Plants
  - Wind Farms
  - Solar Farms
- Refineries
- Chemical Plants
- Manufacturing Plants
- Mining Operations

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Sample Global Applications 1/2

Country	Application	Description
Australia	Industrial	Aluminum Mine (ClearView Enterprise) Desalination Plant
Indonesia	Utility	All new and upgraded distribution substations
Brazil	Industrial and Utility	Refineries Transmission Substations Distribution Substations Manufacturing Plant Substations Cogeneration Plants Small Hydro
South Korea	Industrial	Electronics MFG Plants Refineries
Serbia	Utility	Transmission Substations Distribution Substations
Czech Republic	Industrial	Power Data to DCS, Power Plant

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Sample Global Applications 2/2

Country	Application	Description
Vietnam	Utility	New Distribution Substations
Peru	Industrial	Mining Operations
Italy	Industrial	Chemical Plant
USA	Utility Industrial	Distribution Substations Transmission Substations Wind Farms Solar Plants Refineries Chemical Plants Mining Operations Power Plants
Colombia	Utility	Distribution Substations
Canada	Utility Industrial	Distribution Substations Wind Farms Mining Operations
Mongolia	Utility	Distribution Substations Generation Substations - Mining

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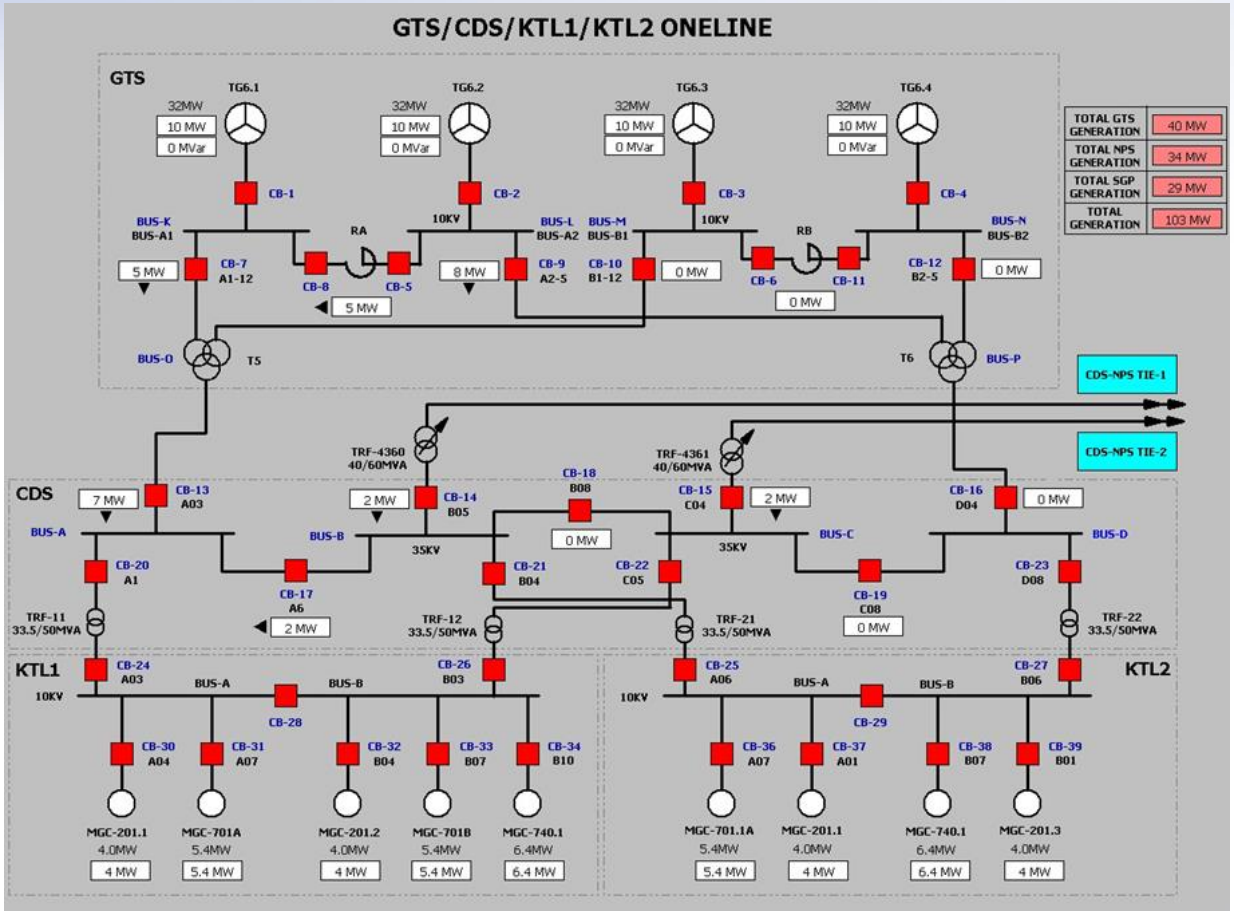
ClearView SCADA

- Leading SCADA solution
- Open access to industrial data
- Advanced visualization tools
- Data logging
- Historical data analysis, trending, reporting
- Comprehensive alarm processing
- Powerful tool for rapid project development
- Simple wizards
- Advanced scripting
- Advanced security
- Redundancy
- Localization support

One Line Example



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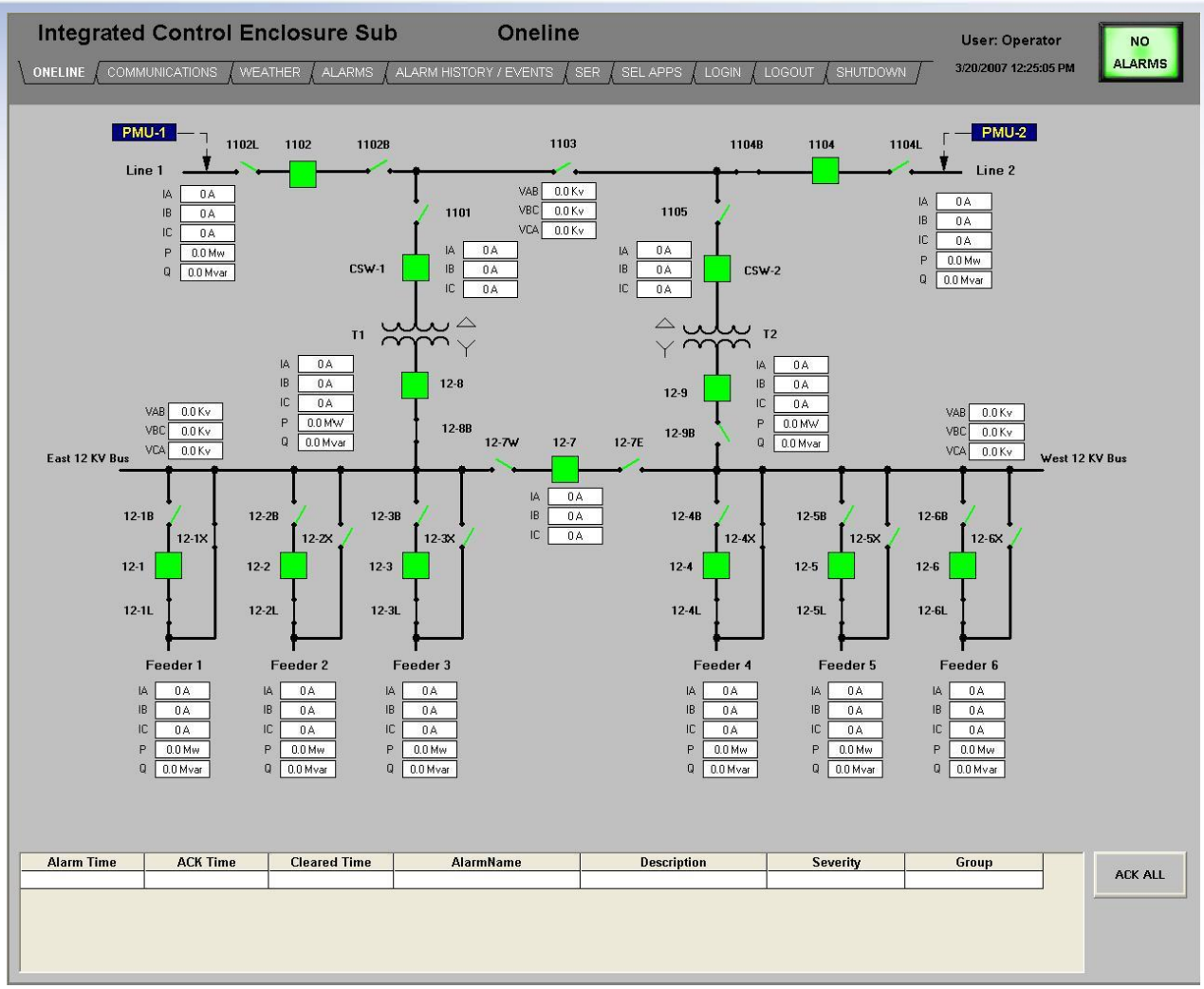
One Line Example



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SCADA Fundamentals Description

- **Open system topology**
  - Script based customization
  - Provides Automation Interfaces and tools
  - Custom application development
- **Client–Server architecture**
  - Multiple OPC and SCADA Servers
  - Multiple SCADA and OPC Clients
  - Redundant solutions
- **Compliance with industry standards**
  - OLE/DB and ODBC
  - COM, OPC and ActiveX technologies
- **Superior graphical interface**
  - Built-in objects
  - Extended object libraries
  - Ability to use 3rd party ActiveX objects
  - Access to any object's public property
  - Ability to create & share new objects
- **Enhanced system security and audit trailing**
  - Network-wide individualized access
  - Object level access rights
  - Compliance with 21 CFR part 11 regulations
- **Alarm, events and data logging**
  - All alarm and events are logged automatically
  - User selectable data logging
- **Analytical tools**
  - Built-in trend-viewer
  - Built-in reports
  - User configurable trending
  - User configurable reports
  - Alarm/Event viewer and query tool
  - Chart ActiveX controls
  - Maintenance logbook
- **Multi-Language Support (Globalization)**

ReLab Enterprise SCADA Solution

- Based on ReLab Software Platform
- Inherits all qualities of the Platform
  - Performance (50K updates per second)
  - Robustness (built on proven technologies)
  - Scalability (from single substation SCADA to Enterprise solution)
  - Integration capabilities
- Flexibility, customization
- Rapid project development (online modifications and more)

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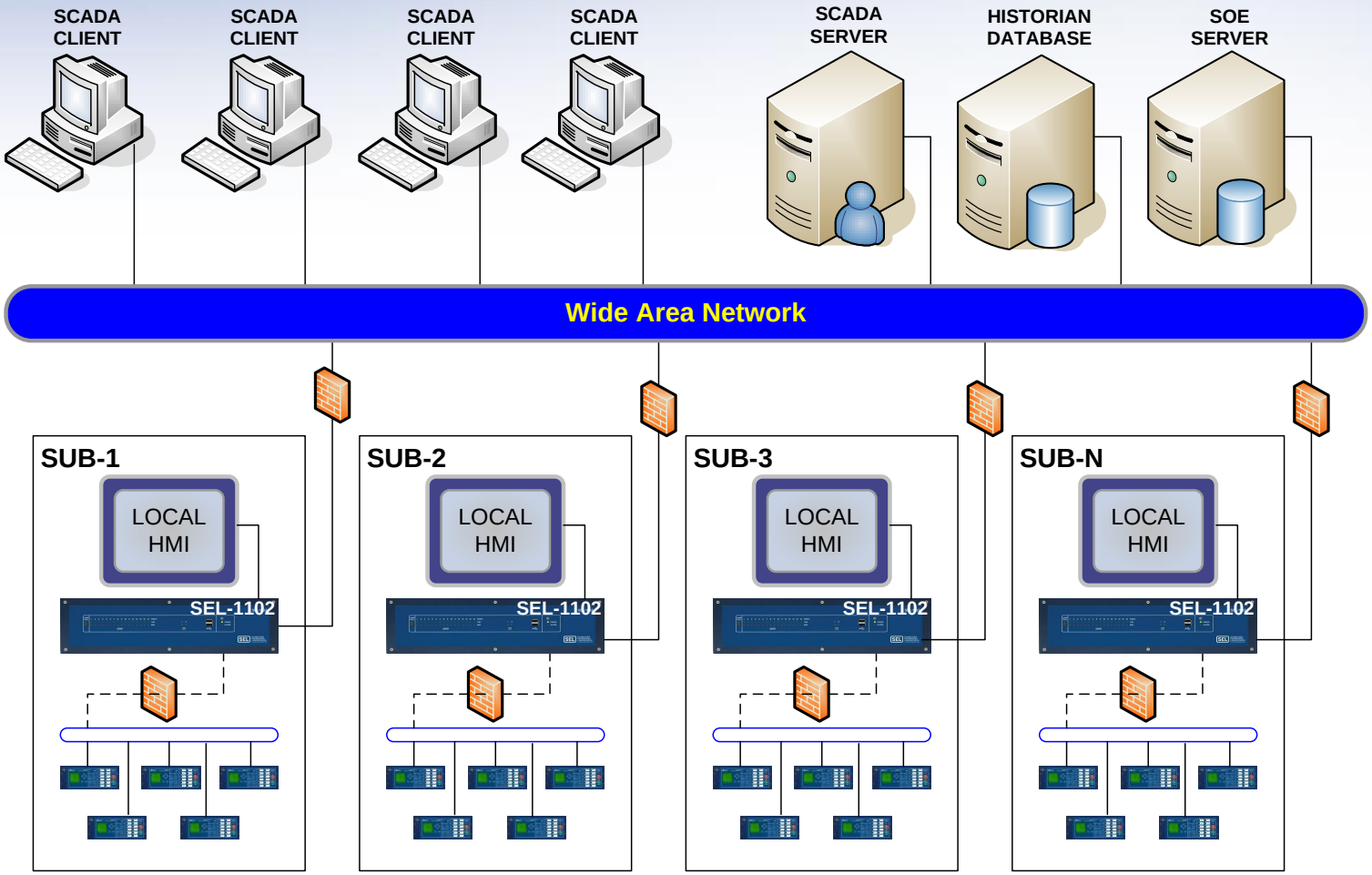
ReLab Enterprise SCADA Solution



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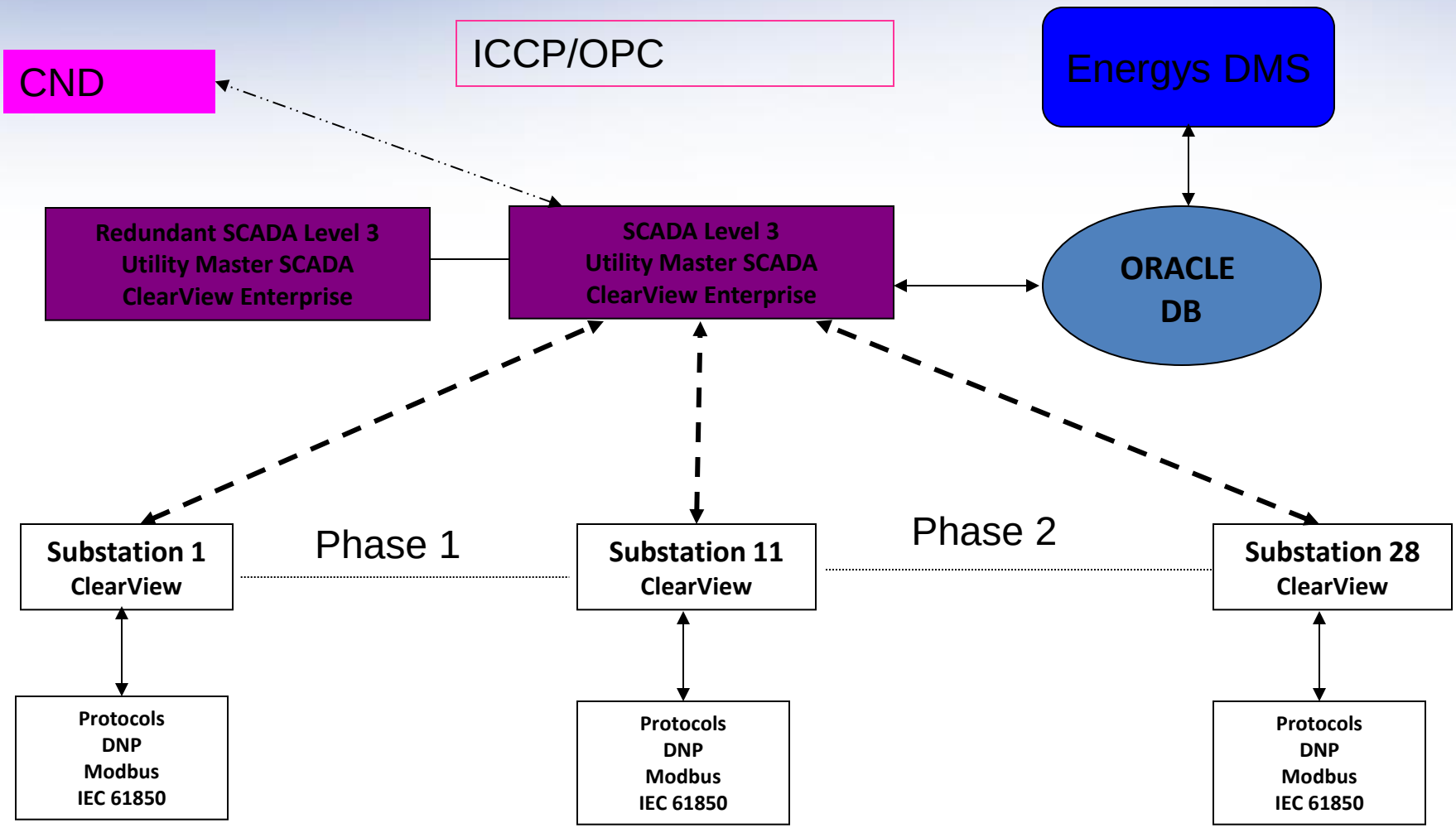
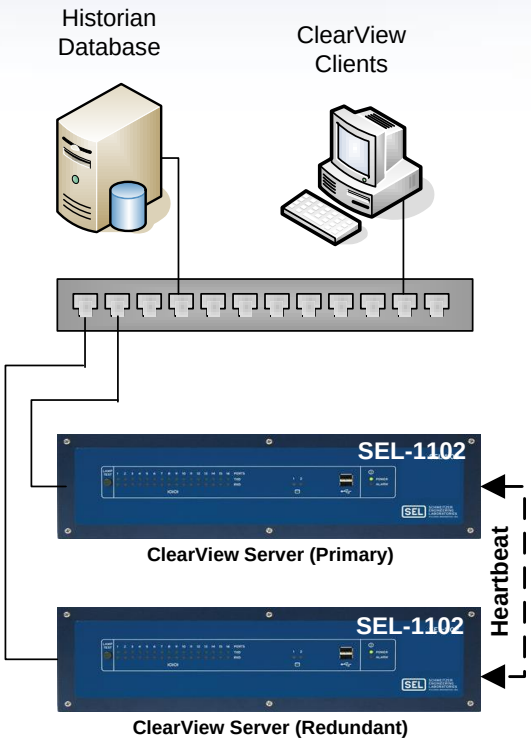
Utility Level 3 Application Using OPC Communication

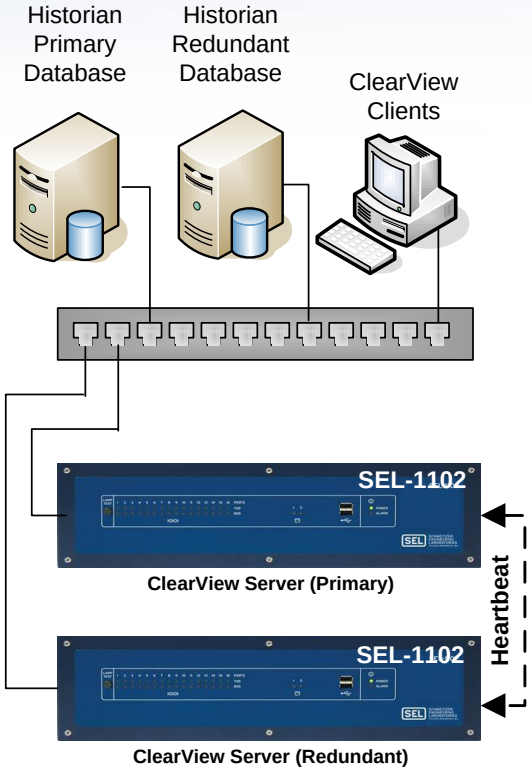


ReLab SCADA Redundancy Topology

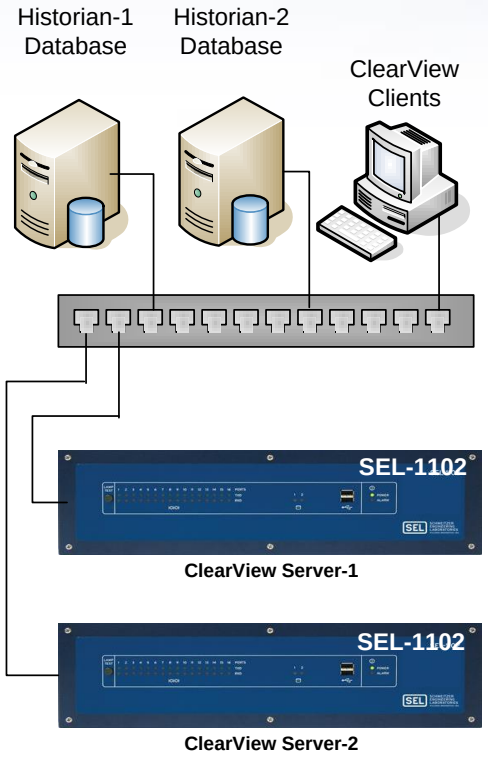
Basic Redundancy



Redundant Historians



Parallel Systems



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ClearView Geographical Information System (CVGIS)

- Geographical Information System (GIS) option now available with ClearView
  - Provides geographical view of assets
  - Can be used to monitor independent and interdependent assets
- Based on Alarms and Tag from ClearView project database
- Easy to use, operates within the ClearView Client
  - Separate Configuration and View screens
- Can be use in standard ClearView and ClearView Enterprise applications.

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Background

- Geographical Information System (GIS) option available for ClearView
  - Provides overview for geographically dispersed assets
- Alarm Driven
  - Displays Alarm Condition and Status
  - Displays tags associated with Alarm Condition
- Maps can be imported from multiple file formats
  - Format: .bmp, .dgn, .dxf, .jpeg, .png, .shp, .tif/tiff, .ttkjp
- Sites and connections can be configured on the map
- Zoom and Pan Features Available
- Applications
  - Monitoring and remote SCADA for renewable generation
  - Master SCADA for control room with multiple substations
  - Fault location and isolation for Utility SCADA solar and wind generation plants
- Can be combined with ClearView Enterprise SCADA Server

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Renewable Generation

- Asset Management – Independent Assets
  - 4 Wind Farms
  - 1 Solar Park
  - No connectivity between generation sites
- ClearView Client with standard ClearView application
  - Can be used on a PC

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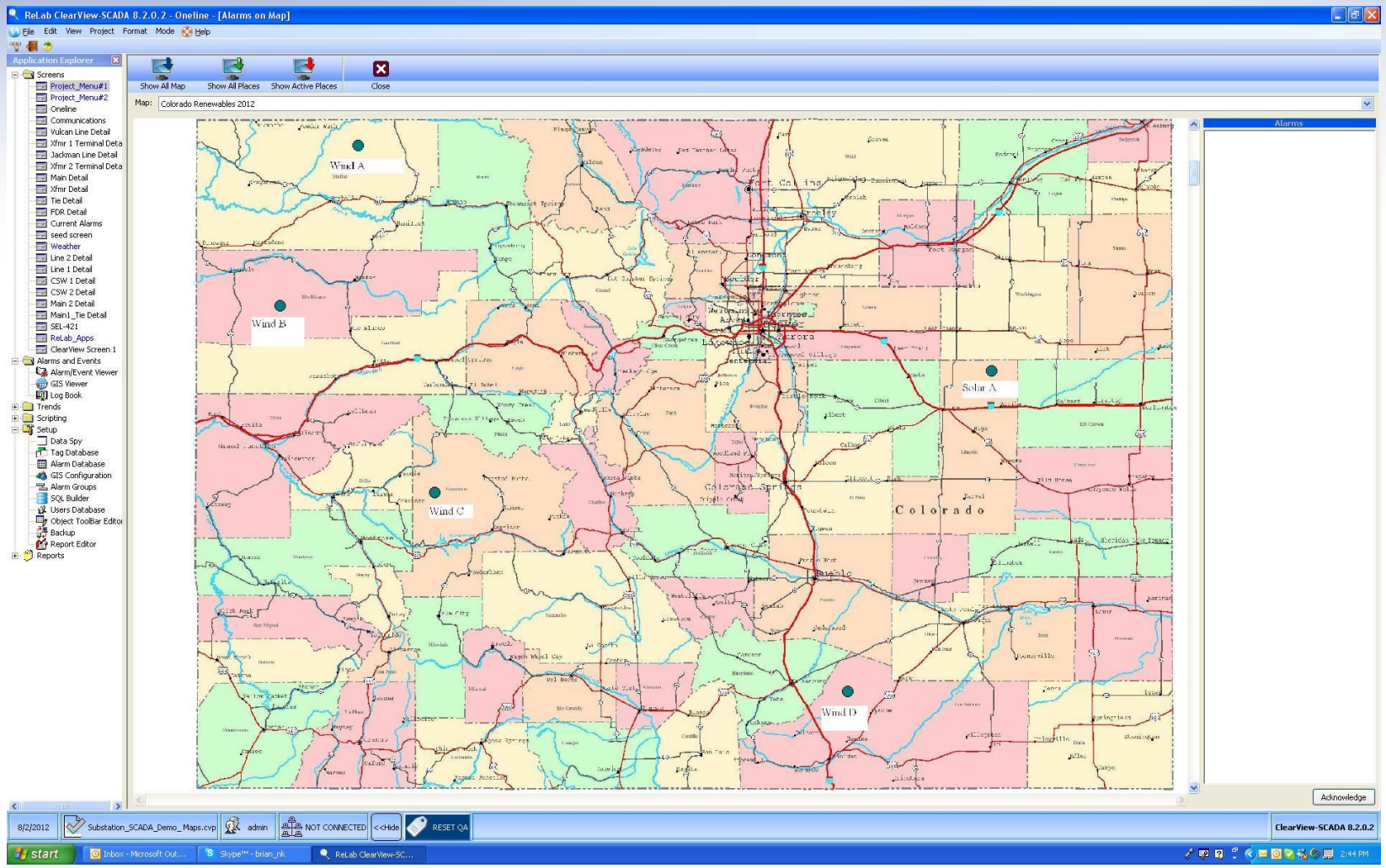
No Alarms



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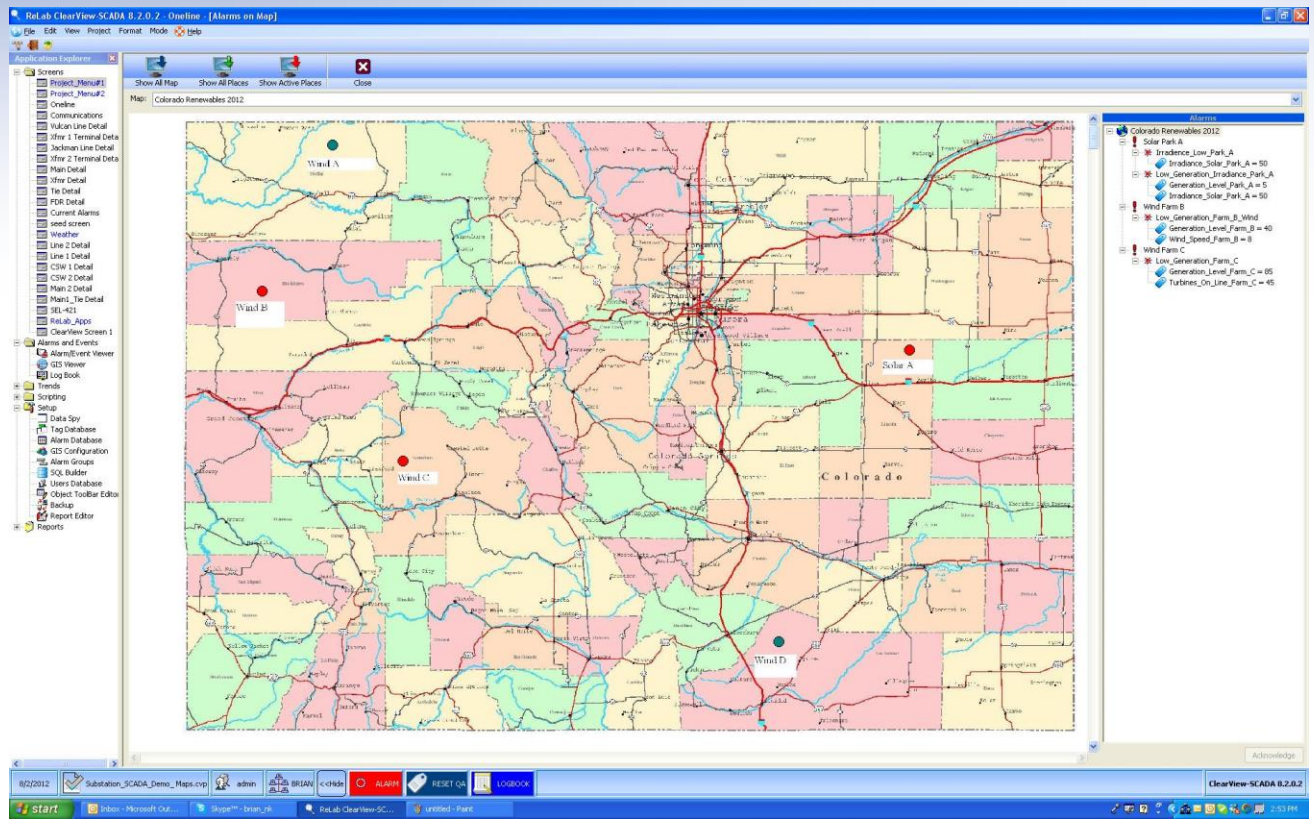
Active Alarms



- Displays alarm
- Displays analog values associated with Alarm with current data

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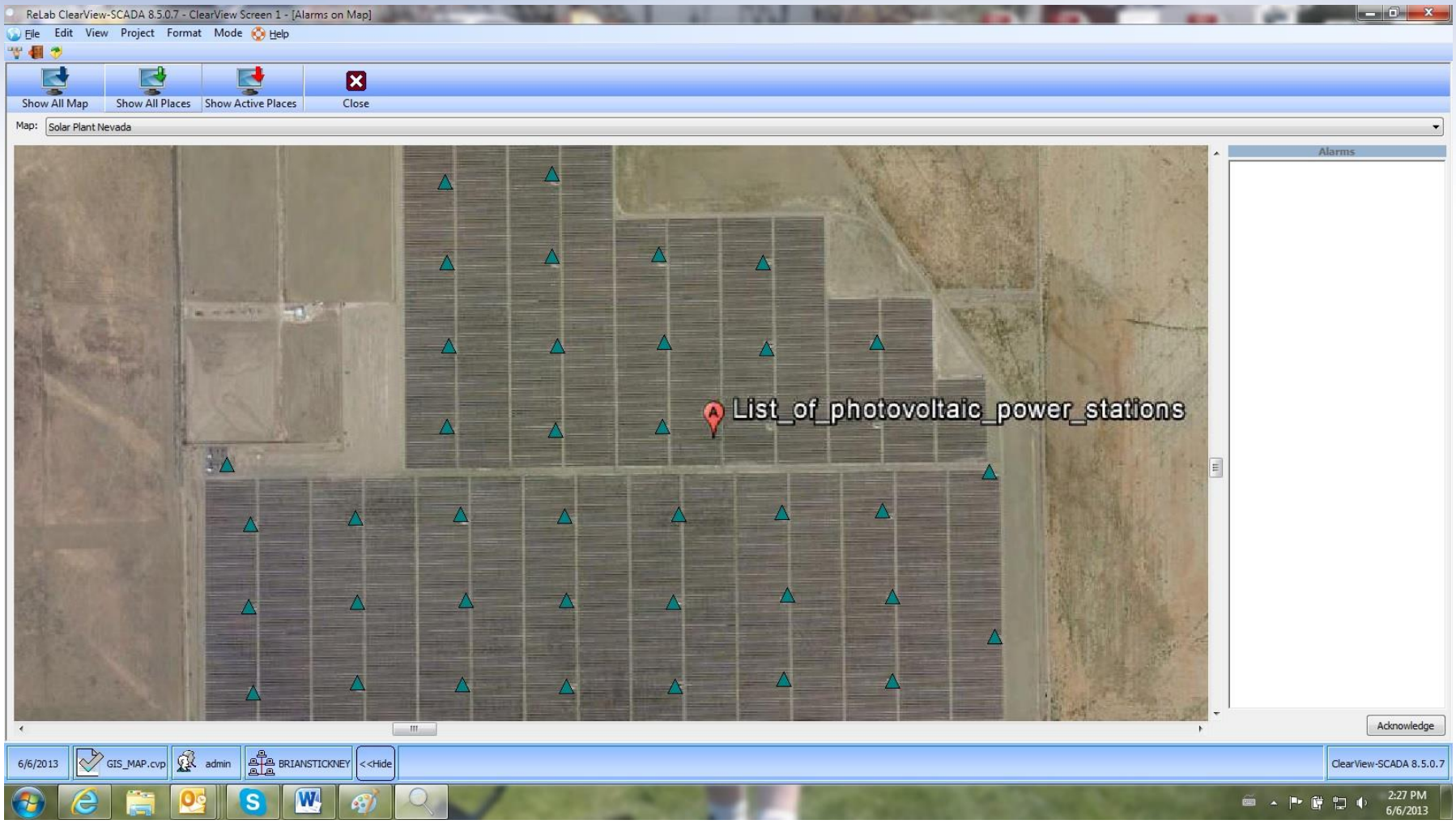
PV Plant No Alarms



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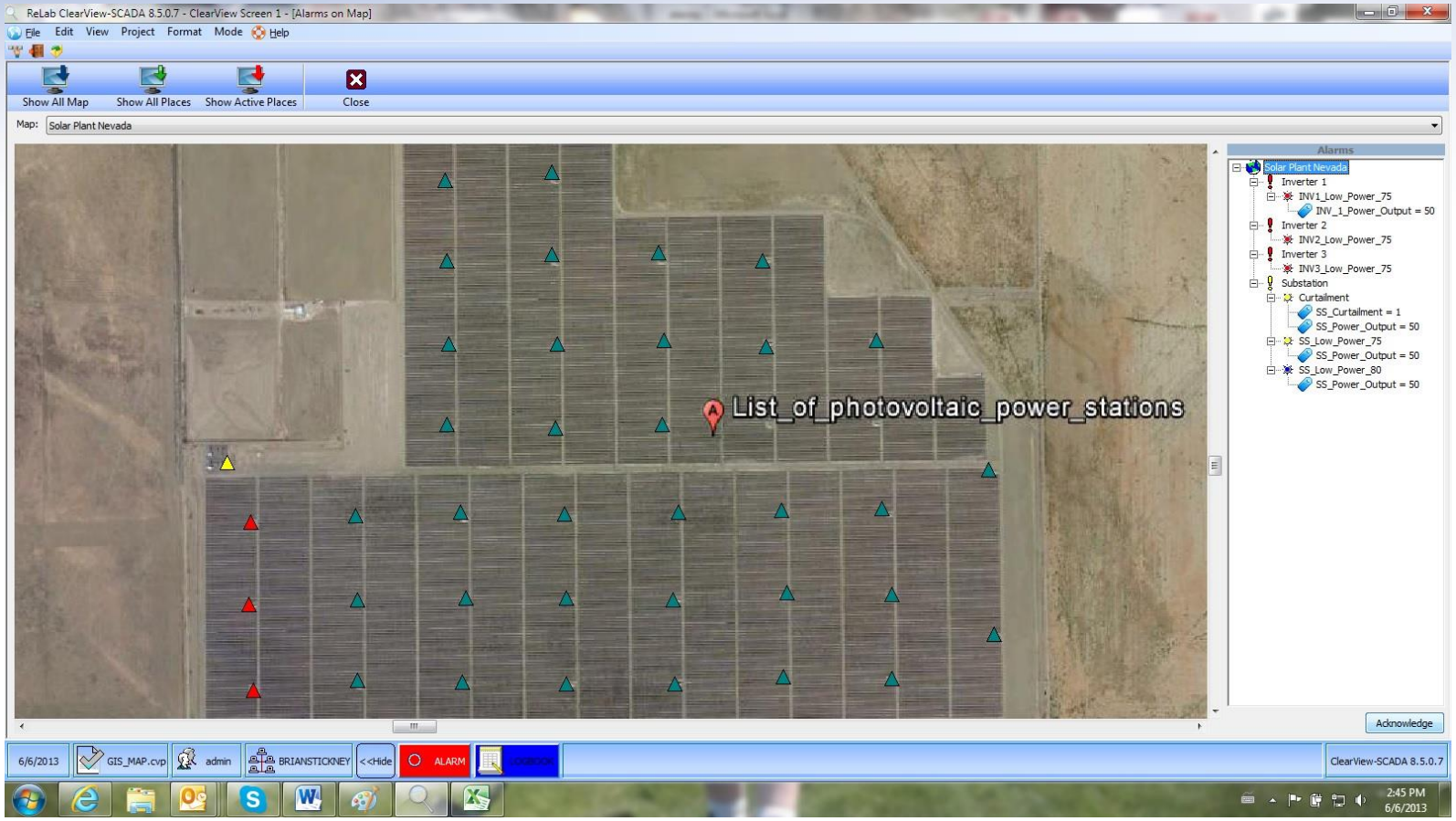
Curtailment with Inverter Shutdown



Three Inverter Stations Shut Down as part of Curtailment Condition

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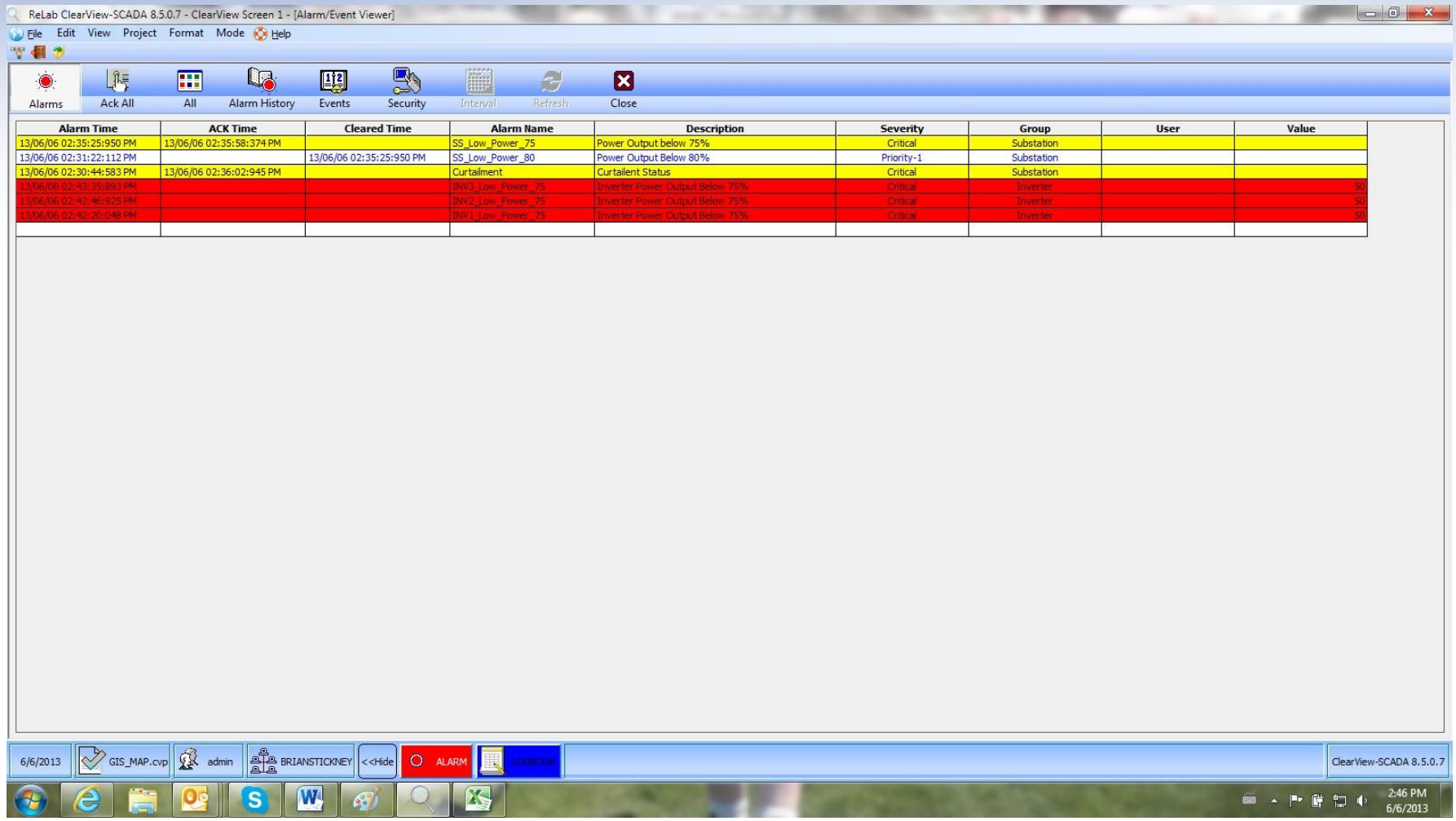
Alarms Curtailment Condition



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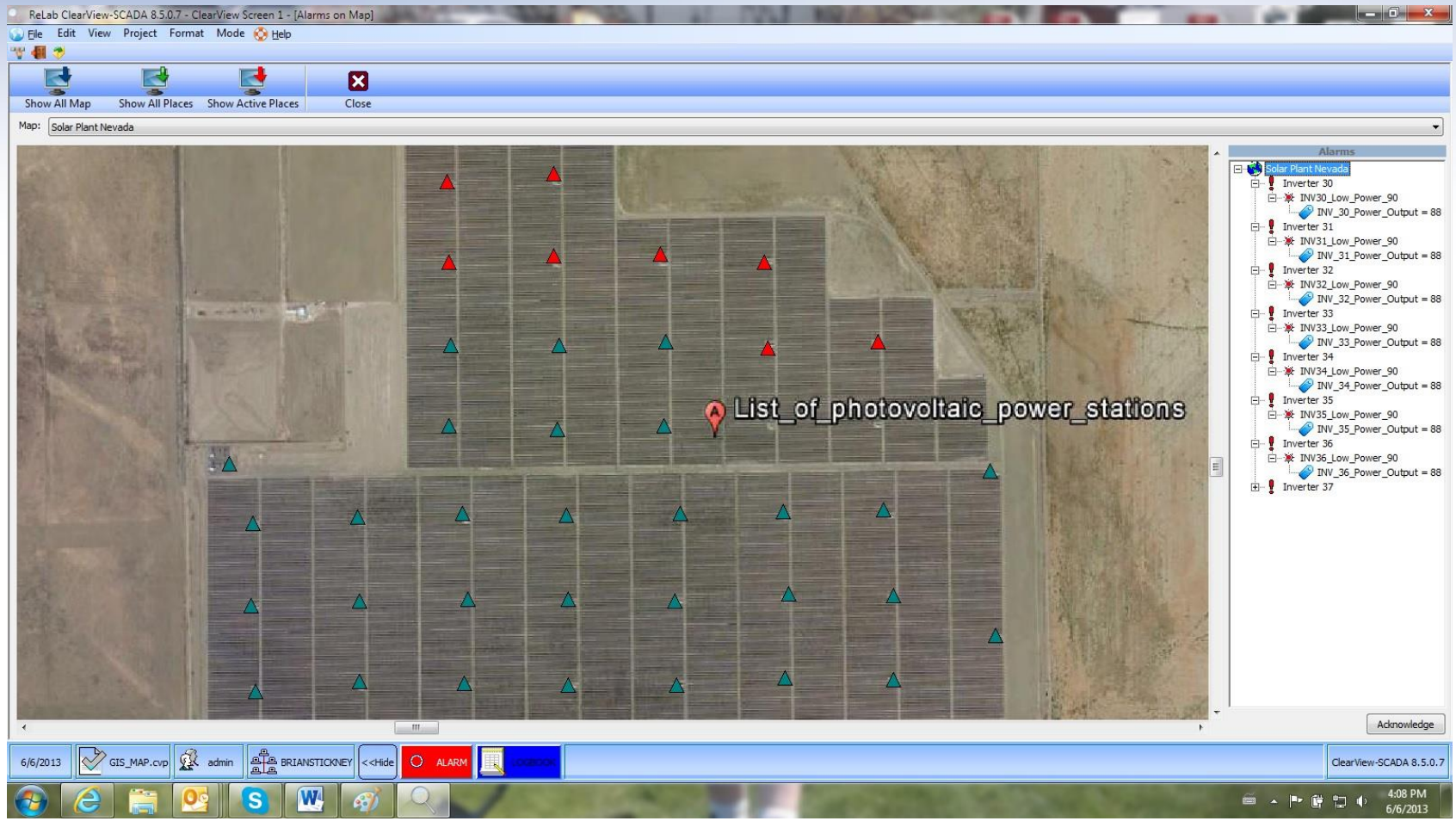
Region Event Low Power



Possible Cloud Cover issue, correlate with weather station

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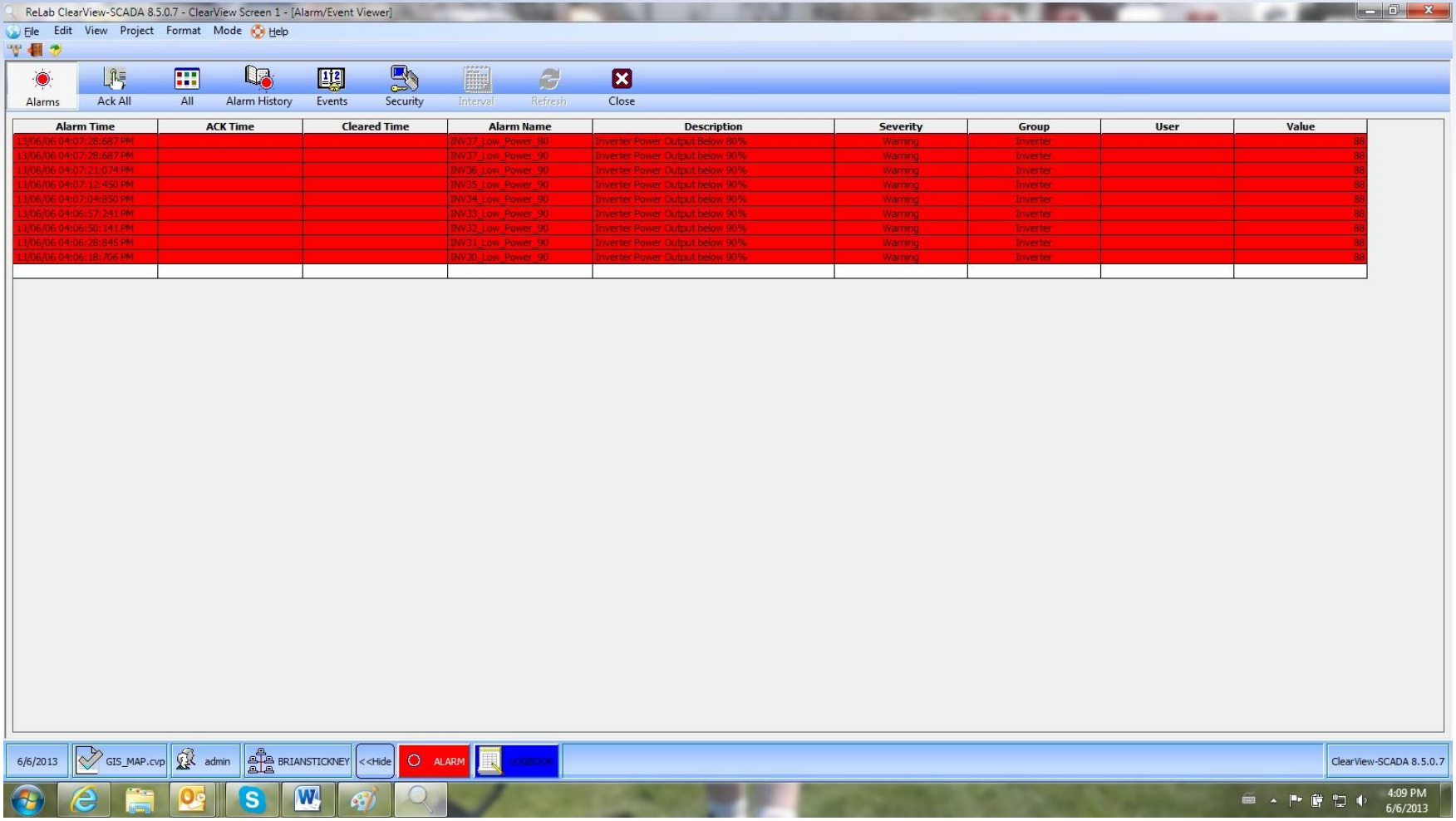
Region Alarm Event



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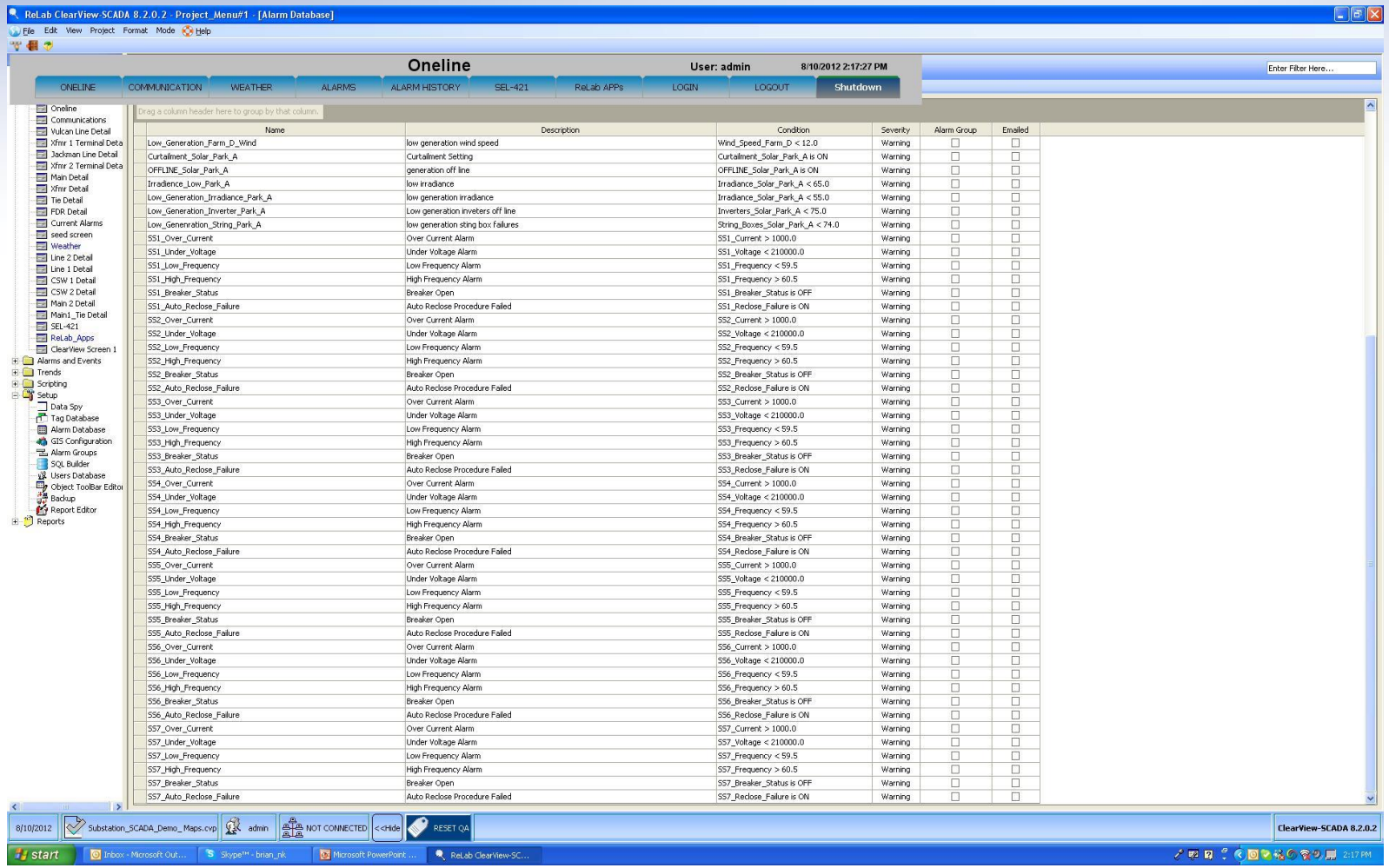
Alarm Database Substation



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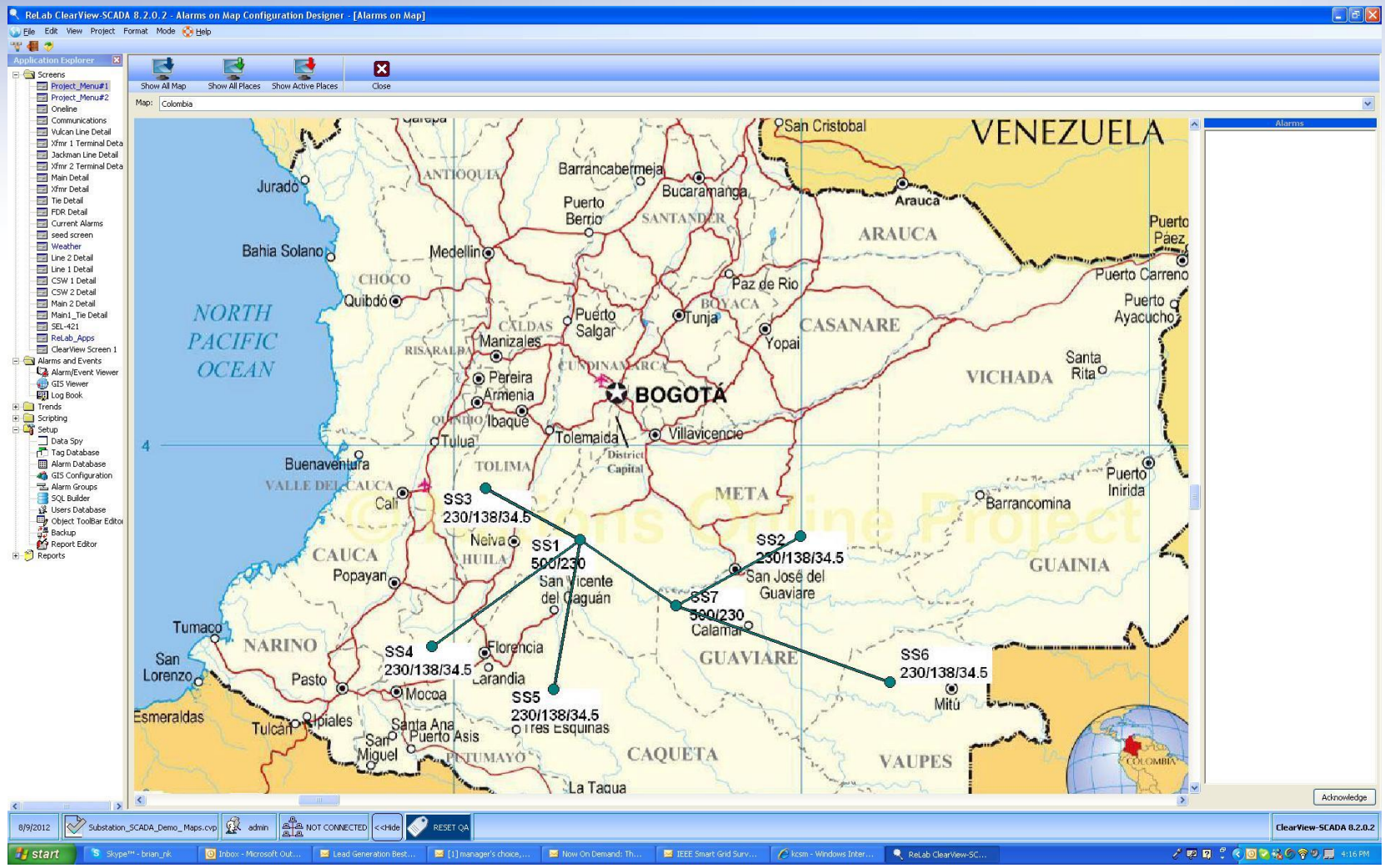
Asset Map No Alarms



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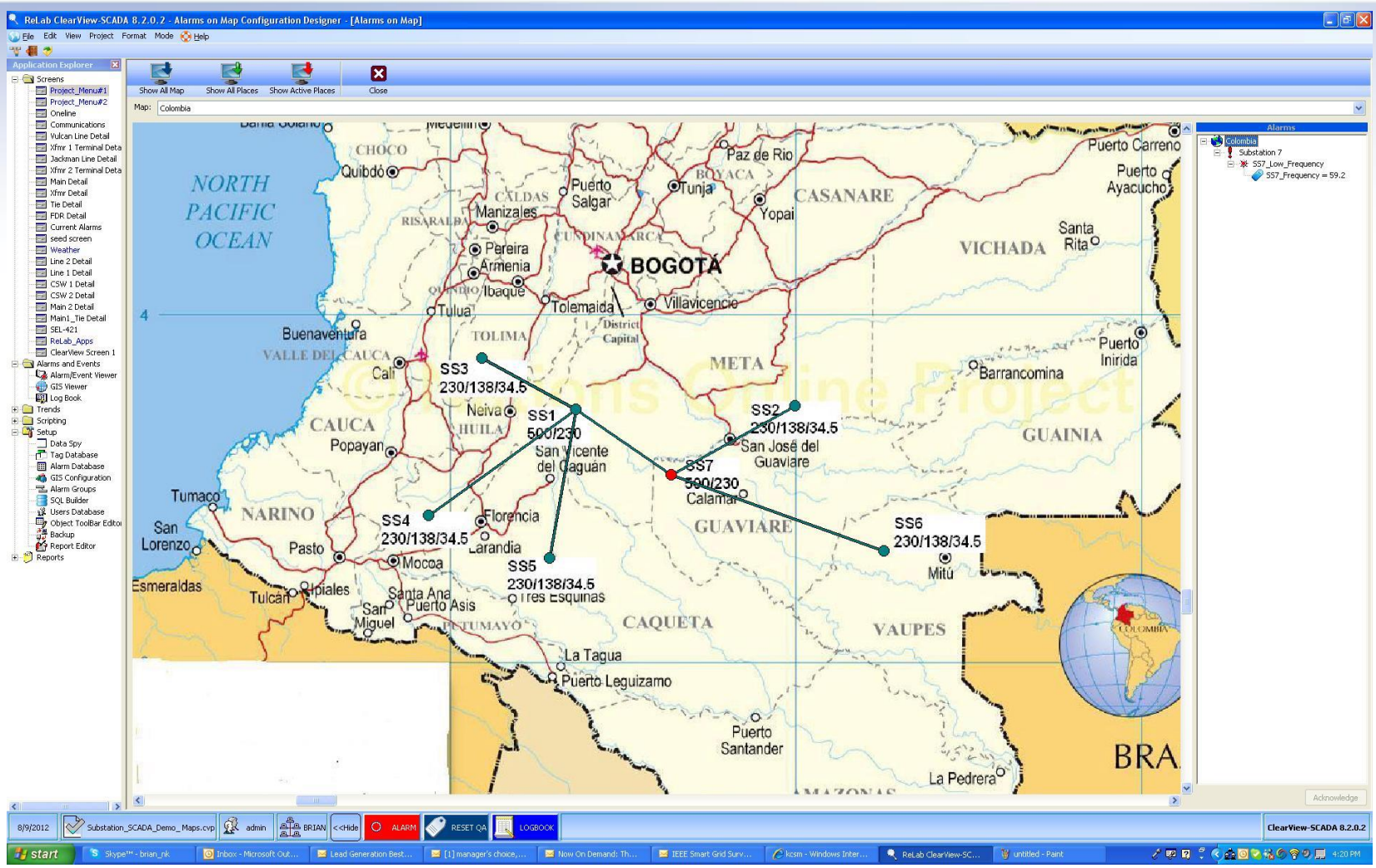
Single Substation Alarms



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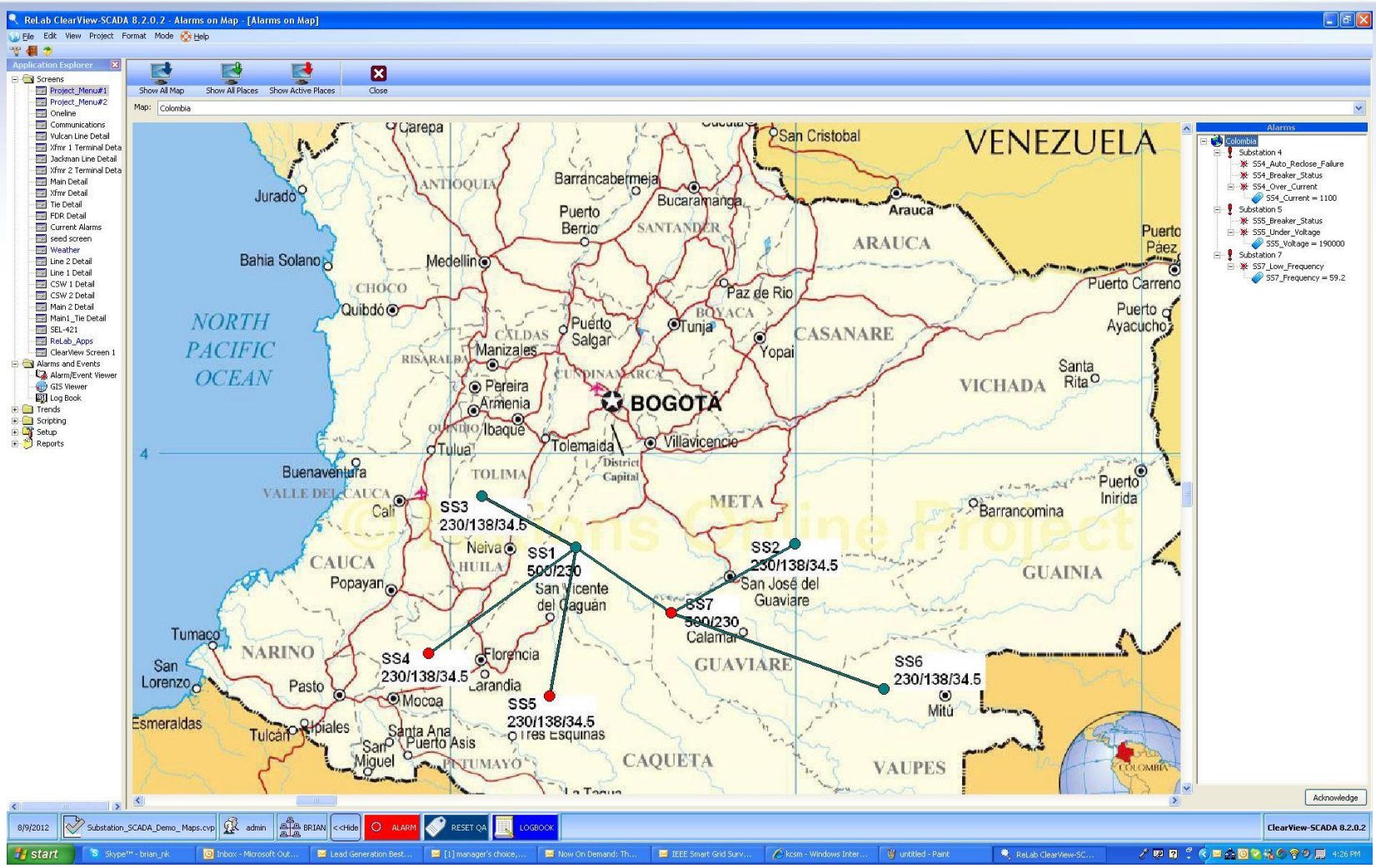
Multiple Substation Alarm Conditions



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Comtrade File Viewer

- Object to view oscillographic records
  - System disturbances
  - Faults
- Automated collection of files by FTP File Transfer per IEC-61850-8-1

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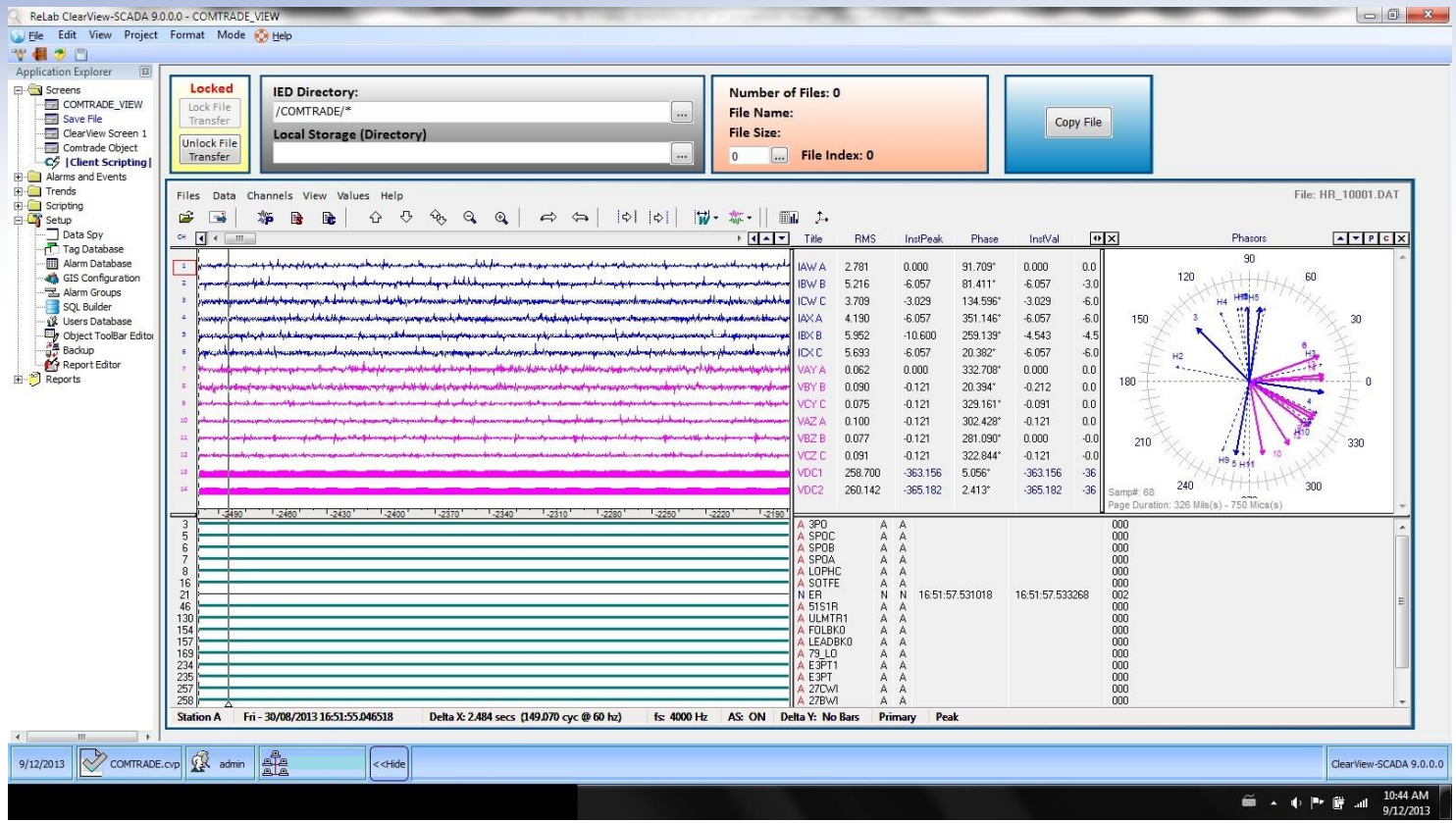
Automated Comtrade File Viewer



- Object to view oscillographic records (System disturbances & Faults)
- Automated collection of files by FTP File Transfer per IEC-61850-8-1

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Graphical Reports

- Pie, Bar, Area and Line Charts
- Conversion of tabular data into graphical format
- Application Examples
  - Energy production
  - Load Consumption
  - Wind Velocity over time or by location
  - Irradiance over time or by location
  - Parameter Change (V, I, Frequency, Active and Reactive Power, Angle)
  - Equipment Performance/Characteristics
  - Comparison of Assets for Enterprise Level Applications

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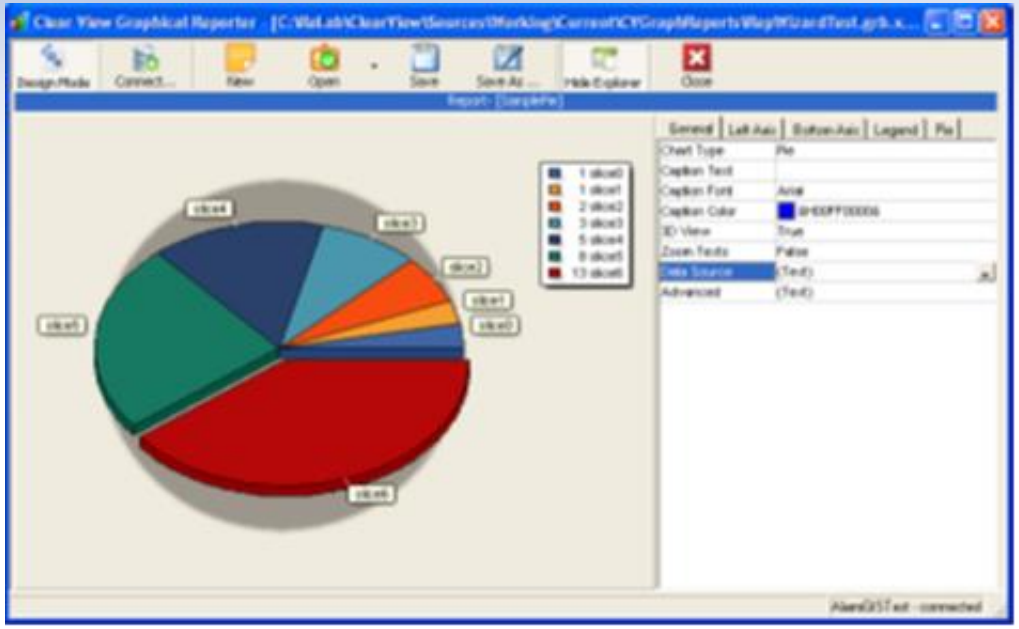
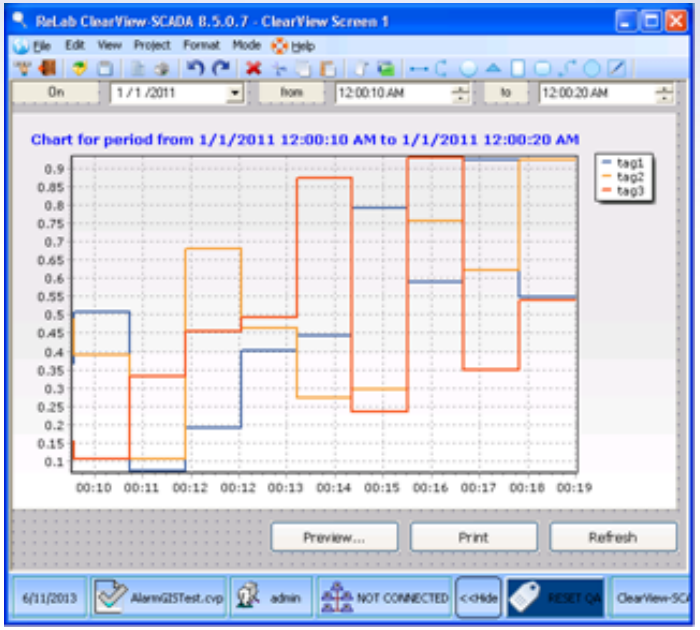
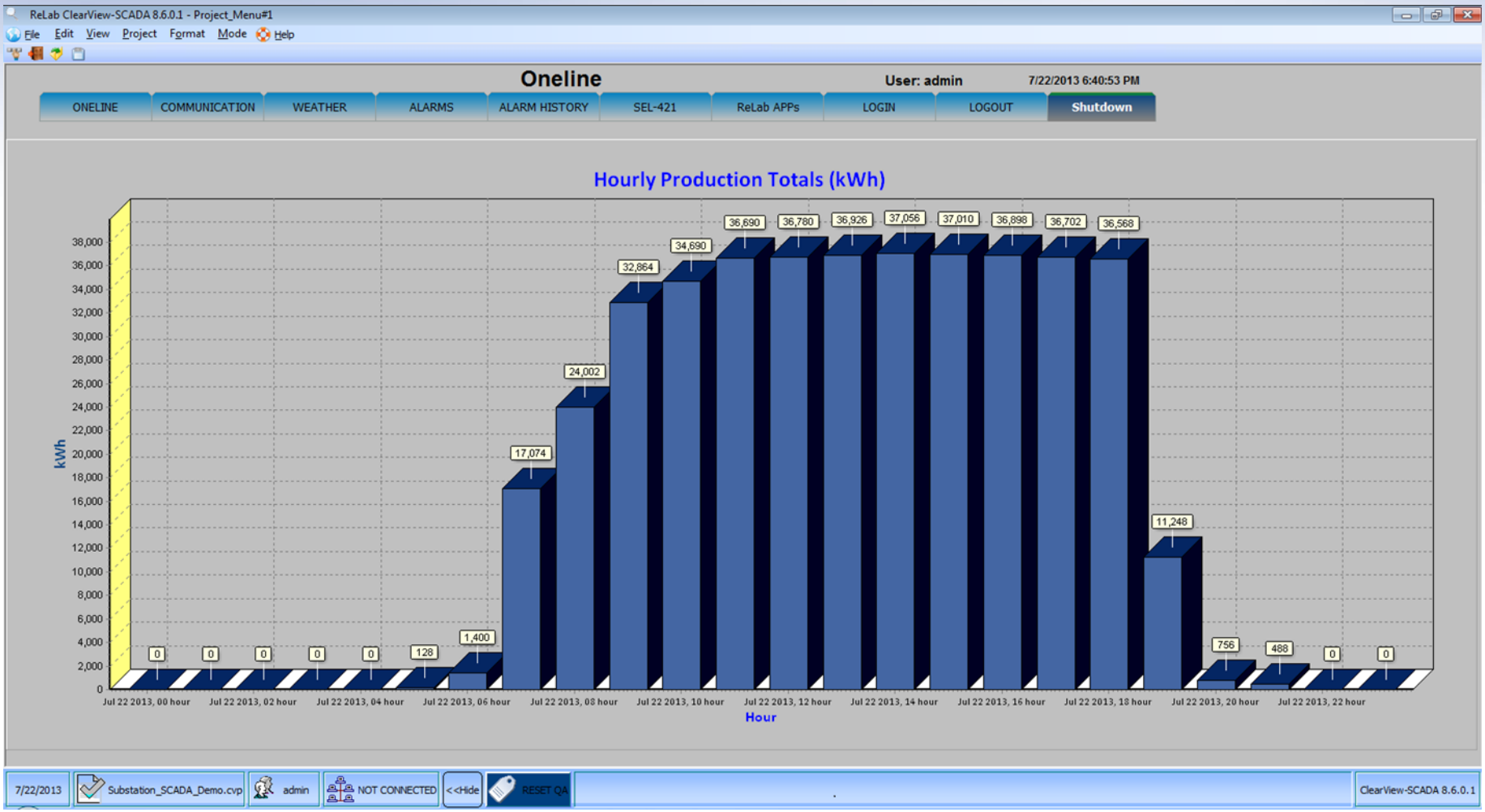
Chart Examples





Application Example



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ReLab OPC Server (RLOPC)

- Unique performance and reliability
- Thousands of tags
- High update rates

Protocols:

- SEL OPC Driver (All SEL protocols)
- Synchrophasor IEEE 37.118 Driver (PMU)
- Synchrophasor IEEE 37.118 Driver (PDC)
- Modbus Driver
- Simulation Driver
- IEC 61850 Driver (MMS)
- IEC 61850 Driver (Goose)

IEC 61850 Driver

We budgeted two weeks of work to configure the other vendor's IEC 61850 solution.

With your IEC 61850 OPC Server we were able to configure the entire system in 6 hours.

A great product with exceptional support

Dorran Bekker, Consolidated Power Projects

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IEC 61850 Driver

- Advantages
  - Simple to use -- Doesn't require deep IEC 61850 knowledge
  - Rapid configuration – Devices configurable in 10 minutes
  - Scalable – From a single device to a large geographic area with many devices
  - Truly Interoperable – Multi-vendor support
  - Low cost-of-ownership with fast ROI
  - Getting maximum of IEC 61850 performance
- Functionality
  - Utilizes protocol self-describing capabilities
  - Supports IEC 61850 buffered and un-buffered reports
  - Mapping of all data types
  - Real device quality and timestamp of OPC meter and status values
  - Hides complexity of IEC 61850 writes

IEC 61850 GOOSE

- Self initializing Read IED Goose control block configuration via. IEC 61850 MMS
- Initialize with simple and intuitive XML description configuration file
- Easily to configure and therefore provides reliable gateway into Goose network
- Fast and simple IED >> PC >> IED communication

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Summary

- Wide range of advanced applications
  - Substation Automation
  - IEC-61850 Substation Automation
  - Synchrophasor implementation
  - Global Presence – ReLab Software products are running around the world
- Product implementation is fast and painless
  - Ease-of-use, designed for the non-programmer
  - Minimal training required
  - Robust design with high reliability
- Low Cost-of-Ownership and Fast Return-on-Investment
  - Priced per instance/computer
  - Very high Performance/Price ratio
  - Scalable

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