# ClearView SCADA Benefits

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ReLab Software's ClearView SCADA is a true out-of-the-box solution with all the components necessary for deployment in substation automation and control room applications. ClearView is built for the time critical applications of utility and industrial power customers.
ClearView is designed for:

- Ease-of-Use;
- Reliability;
- Interoperability;
- Scalability (unlimited tags);
- Low cost-of-ownership;
- Fast return-on-investment.

ClearView is based on client - server architecture. A single client can be used with multiple servers and a single server can support multiple clients. All installations simultaneously support development and run-time operations. Out-of-the-Box ClearView includes graphics editor, trending, alarm, reports, MS Access and MSDE Databases, historian (integrates with all ODBC compliant database applications) and a large object library.
ClearView is designed for users with limited programming experience, to make it easier to use for a broad range of customers. In addition to the design of the objects for ease-of-use, a customer can utilize scripting to develop a customized application (though this is not required). ClearView has design-on-the-fly capability; one screen can be modified, while the rest of the screens and the server are operational. Once a screen has been modified, it can be updated while the server and other screens are running. No hassle of having a separate development environment and then porting of the new screens to the run-time systems.

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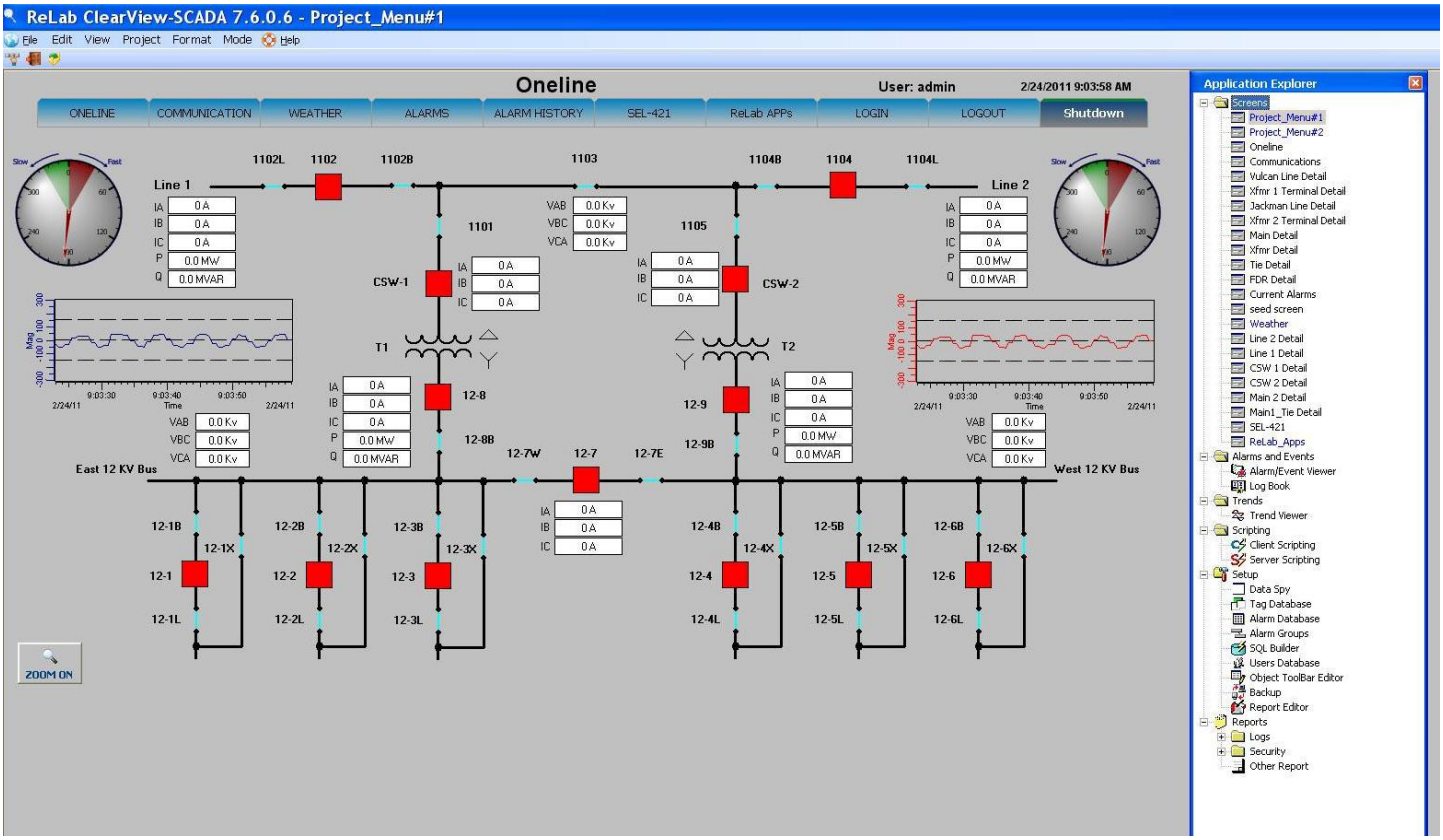


**Figure 1 – Example of Substation One-line**

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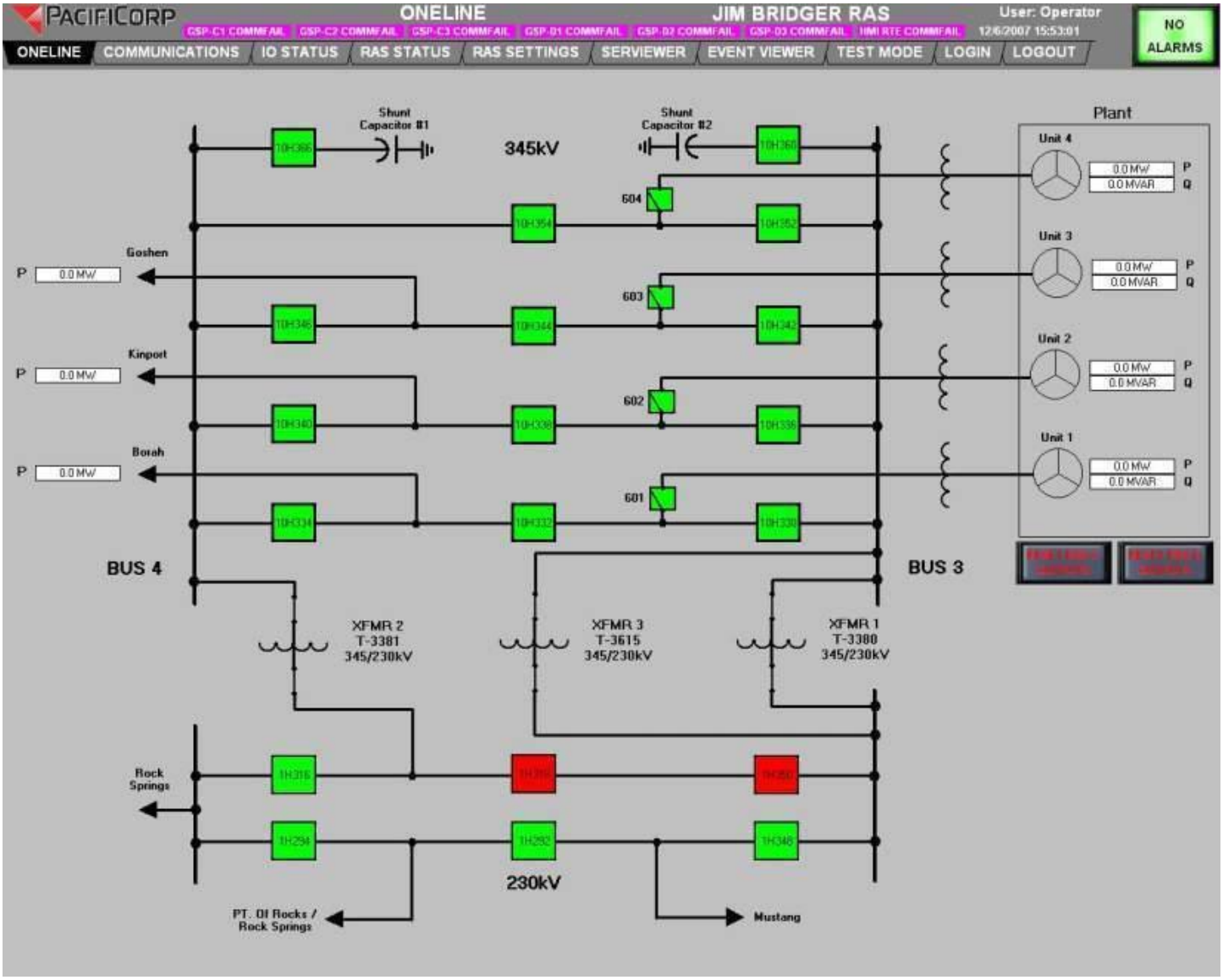


**Figure 2 – Example of System One-line**

The same ClearView package is used for both the substation HMI and the Control Room HMI.

ClearView was designed by engineers for engineers. A computer programming background is not required to build an HMI and load the tag database. Reliability is a key component of ClearView's architecture and for all ReLab products. Minimal CPU and memory requirements are the key benefits of the design and functionality of ClearView. By focusing the product on minimal CPU usage, ClearView increases the reliability of the system because CPU overloads are a major reason for system crashes. ReLab's systems have operated in the field for more than 10 years without crashing.

Interoperability is the key advantage of ReLab's products. It allows support of best-of-breed systems that require software and hardware components from multiple manufactures. ReLab's products will interface with all OPC

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compliant applications. Additionally ClearView can be set up to interface with any ODBC compliant database. These features make ReLab's products highly interoperable and ideal for any best of breed configuration.

ClearView provides financial benefits in addition to the broad range of functionality. Low cost-of-ownership is a key feature. Support can be purchased on an as needed basis. Typically customers are self-sufficient and can work independently after receiving ReLab's on-site training. ReLab provides a lifetime warranty for all products as long as the environment has not been changed. With these features, the customer can upgrade products based on enhancements added over time and is protected with the lifetime warranty.

ClearView provides fast return-on-investment. The cost of ClearView is typically recovered by the reduction of integration/programming time required with other SCADA-HMI packages. This is a true measure of the ease-of-use features of ClearView.

The low cost-of-ownership, fast return-on-investment and rich features combined with the ease-of-use design make ClearView an optimal solution for small as well as large utilities. Unlimited tags enable ClearView to meet customer needs today as well as in the future with no additional cost for expansion.

ClearView has been implemented for a wide range of power applications, from substation automation to regional/utility control room applications.

## Some of the end-users and integrators include:

Grant County PUD
PacifiCorp
NamPower Wells Rural
Aha Macav Power Service
US Navy
Conway Corporation
Schweitzer Engineering Services
Power Engineers

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## Case study

Consolidated Power Project – 3 Year Automation and Protection Contract with NamPower

When Namibia's national electricity utility, NamPower was looking to install modern substation automation technology in the Transmission grid for both new projects and refurbishments, it decided to look no further that Consolidated Power Projects (CONCO) as the solution provider. Using the extremely capable and highly flexible Schweitzer Engineering Laboratories' (SEL) IEDs backed by their legendary support and cutting-edge engineering solutions from CONCO, the perfect match was found.

NamPower's requirements were primarily focused on a cost-effective solution that was to be delivered using the IEC 61850 standard in a comprehensive and flexible manner. Wiring was to be kept at a minimum and complete flexibility was required for the data modelling of the IEDs. The specification called for EHV and HV feeder schemes (both differential and impedance) with the option for integrated line reactor, EHV and HV Transformer schemes, EHV and HV Bus Coupler/Section schemes, EHV and HV Bus Zone protection schemes, EHV and HV shunt reactor schemes and a multi-bay LV scheme. The requirements also included redundant substation gateways and HMIs as well as an Engineering workstation for system management and user authentication. Numerous additional features such as GPS time synchronization of all devices, parallel transformer voltage regulation using the circulating current method, automatic disturbance record retrieval, system configuration management, network monitoring, etc. were also called for.

The solution implemented by CONCO used the 4-series IEDs from SEL in order to meet and exceed NamPower's requirements for protection. The SEL 421 IED is used for feeder protection (the SEL 311L was used for line current differential protection), the SEL 487E is used for transformer and reactor protection, the SEL 487B is used for Bus Zone protection, and the SEL 451 4 is used for Bus Coupler protection, LV protection and Bay Control. As per NamPower's specification, the SEL 2411 and SEL 2440 units are used for a significant proportion of plant-side interfacing. The bulk of the inter-device communication is done by means of the IEC 61850 GOOSE messaging standard. All devices have been modelled as per NamPower's requirements and Logical Nodes such as the GGIO are almost non-existent. The substation gateways are implemented on the SEL 3351 computing platform using ReLab Software's IEC 61850 OPC driver and IEC 60870 5 101/104 slave driver.

**The substation HMIs uses ReLab Software's IEC 61850 OPC driver, GOOSE driver and ClearView HMI.**

The network infrastructure providing both high speed switched Ethernet for the Local Area Networks and the Wide Area networking is provided by RuggedCom's RSG2100 switches and RX 1100 routers respectively. CONCD's flexible and open design has allowed NamPower to easily extend the infrastructure provided to support applications such as Voice over IP and transformer monitoring with scope to further extend to synchrophasor applications, wide-area protection and substation equipment video monitoring in the near future.

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