

PROJECT PROFILE



Vineyard Irrigation Pump Replacement Program
West Coast Grape Farming
Farmington, California



On September 22, 2003, California Governor Grey Davis signed into law Senate Bill 700. This bill amended air pollution control regulations in the California Health and Safety Code to include requirements for agricultural sources of air pollution.

The bill specifically includes portable engines and off-road engines, such as diesel powered irrigation pumps used in the production of crops. Previously, the code had exempted these sources from the requirement to obtain air permits.

To avoid the stringent permitting requirements, many agricultural businesses are removing the diesel generators and moving to utility electrical power. West Coast Grape Farming is one such business.

At their Carter Ranch vineyard in Farmington, California, Tesco Controls was asked to supply pump controls and electrical panels for two well sites, and for the booster pump station at the vineyard's reservoir.



Diesel powered irrigation pumps such as this have been subject to revised air quality standards. Many are now being replaced with modern, electrical utility powered pump systems.

Tesco worked with Arthur Engineering, Inc. of Elk Grove, California and the facility Owners and Operators to design the system to fit their needs.

The two well sites pump water to the reservoir, where the booster pumps move the water through the vineyard's drip irrigation system. The sites all communicate via security-encrypted wireless Ethernet, using MDS iNet radios. This enables an operator to receive telemetry data and to control all pump operations from any site using any of the PLC OITs. This operation is possible due to the L2000 PLC's "remote control" feature.

A Unique Challenge

The real challenge here was not the control scheme or communications, which Tesco Controls has been excelling at for nearly 40 years. The challenge was making the primarily Spanish speaking operators comfortable with the equipment and its operation.

To meet this challenge, Tesco engineers approached it many different ways; initially the proper solution was thought to be an LCD touch screen operator interface, which could be switched between English and Spanish with the press of a button. Considering the heavy usage and operating conditions that the equipment would be in, a more industrial-quality interface was preferred.

A solution was reached using Tesco L2000 full-sized operator interfaces. Tesco's L2000 interface features industrial strength powder-coated aluminum construction, with a stainless steel face plate. Mounted on this faceplate is a permanently sealed membrane keypad. The keypad has "blister" type keys that provide tactile feedback and is designed to be impervious to corrosive agents such as liquids, gasses, and fine particulates like blowing dust and dirt. The dust and dirt is the primary concern because the equipment is installed in the vineyard, exposed to the elements and the agricultural environment.

The operator interface is configured with both English and Spanish captions. In fact, all controls and indicators in all three motor control centers are labeled in both languages.



Tesco Controls' motor control center in the freshly planted vineyard. Note the sun shields on top and back. The sun shields provide a 15 degree reduction in temperature on the enclosure.

Ease of Use

Ease of use was a theme throughout the design phase. One example of this features a Raco Catalyst cellular auto-dialer, configured to place a phone call that will alert operators when alarm conditions are met. Also, external flashing beacons are installed on all three cabinets. These beacons visually alert operators (who may be driving through the vineyard) to an alarm condition.

Another example is the result of a request by the owner- removable, washable, High Efficiency Particulate Air (HEPA) dust filters. Tesco engineers redesigned the filter mounts inside the enclosures allowing operators to use standard, off-the-shelf, washable HEPA dust filters to protect the equipment.

Finally, sun shields are used extensively, on the top and sides of the enclosures, as well as exposed heat sinks on the Variable Frequency Drives (VFDs) to protect the systems from the sweltering summers in the San Joaquin Valley sun. VFD's were used to vary the speed of the pumps based on system demand. These VFD's also provide energy and maintenance savings on the motors.

Established 1972 in Sacramento, TESCO Controls Inc. is a CSIA Certified advanced control systems integrator specializing in the water and wastewater industries. For over 30 years our business has been designing, manufacturing and integrating electrical and electronic systems for the control of water distribution and wastewater collection for utilities, industry and agriculture. In addition, our traffic division develops service pedestals and traffic signal battery backup systems for the electrical utility and traffic control industries.

Tesco Controls furnishes a competitive bid for integration services on every water/wastewater construction project, public or private, in all of California and many other states. We are experts in many different engineering disciplines, such as:

- Custom PLC Programming
- Custom SCADA Programming
- SCADA System Design
- Telemetry Communications
- Wireless Radio Studies
- LAN and WAN Configuration
- Network Security Audits
- Construction Management
- Arc Flash Studies
- Manufacturing/Fabrication
- Field Services
- Training & Technical Support
- Professional Engineering Services & Consulting

Our staff of over 200 employee-owners is highly experienced, knowledgeable, and fully capable of designing and overseeing the implementation and integration of your control system.

Tesco Controls employs an open systems design approach for PLCs, RTUs, communications, programming and SCADA systems. Doing so allows us to take advantage of available technology and proven methods for software, communications and hardware integration.

Tesco Controls, Inc. has an extensive support program to provide resources, extended system coverage, maintenance services, telephonic support, technical expertise and 24-hour emergency services.



A Tesco Controls communications engineer installing an antenna for wireless Ethernet communications.

Tesco Controls became an Employee-Owned company in 2004, making every employee an owner and giving them a real financial stake in the company's performance, and the quality of our products & services. This has resulted in a team-oriented culture of ownership, and has allowed us to exceed over \$40 million in sales last year.

In 2010, Tesco Controls will move into our new sales and manufacturing headquarters with 125,000 square feet of professionally planned manufacturing space. This will allow us to streamline operations by bringing all of our manufacturing and engineering assets under the same roof for the first time in nearly 20 years. This will enable us to meet the future needs of our customers, and help us maintain our standard of excellence in controls and systems integration.