

CASE STUDY

Encorp-Controlled Power Systems—Lathrop, California and Denver, Colorado

Relays Protect Genset Solutions for Food Industry Firms

Both California Natural Products and NOBEL/SYSCO were in search of state-of-the-art solutions for improved power system reliability.

Windsor, CO—California Natural Products (CNP), a Lathrop, California natural-food processor of rice-based ingredients, saw the opportunity to lower its hefty electric bill a whopping 20 percent by installing an efficient on-site power system. Given California's precarious power situation and resulting efficiency incentives, the economics favored an on-site power system designed for cogeneration, allowing heat from power generation to be incorporated into CNP's manufacturing processes.

Almost a thousand miles away, another food industry firm, NOBLE/SYSCO, wanted to ensure that production of its 17,000 items—from frozen foods to gourmet items—continued round-the-clock at its 430,000-square-foot facility in Denver, Colorado. The Rocky Mountain region's largest food service distributor, NOBLE/SYSCO was concerned that even a brief power outage would have a resounding impact on its 24-hour operation, disrupting orders for the 7,000+ restaurants, hotels, schools, hospitals, and other firms this \$350-million company serves.

Although CNP and NOBEL/SYSCO had differing reasons, both companies were in search of state-of-the-art on-site power system solutions. After preliminary evaluations of needs and opportunities, both companies incorporated solutions provided by Encorp. Each solution was based on natural gas genset power sources and included Schweitzer Engineering Laboratories, Inc. (SEL) micro-

processor-based relays for monitoring, control, and protection.



Figure 1—After preliminary evaluations, both CNP and NOBEL/SYSCO incorporated solutions provided by Encorp based on natural gas genset power sources and Schweitzer Engineering Laboratories, Inc. (SEL) microprocessor-based relays for monitoring, control, and protection.

Headquartered in Windsor, Colorado, Encorp provides the broadest spectrum available of hardware and software controls specifically designed to support distributed generation operations. Encorp's power technology products and services include energy-automation software, grid-interconnection equipment and the new Energy Management Center. Encorp's vision is to be recognized as the world's leading provider of network technology and infrastructure-management solutions for the distributed energy market.

Cogenerating Savings at CNP

Officials at CNP made the decision last year to install a combined heat and power (CHP) system after learning about the State of Cali-

fornia's incentive program that covers nearly one-third of the total costs for such projects. CNP, which produces a wide range of food ingredients—from conventional and organic rice, to syrups, flours, and sweeteners—would save hundreds of thousands of dollars in up-front power system costs through the state incentive program.

Completed in February 2003, the new system is powered by a 1350 kW Deutz natural-gas engine. With technology designed by Encorp, the system will run 24/7, and is expected to produce more than 9.4 million kilowatt hours each year. In addition to generating electricity when needed, the system will turn excess engine heat—often considered an unusable by-product of an on-site power system—into a tool that will help process rice and other ingredients in the company's round-the-clock manufacturing process.

“This system should reduce our annual electric bill at least 20 percent,” said Pat Mitchell, CEO of CNP, explaining that the new system is expected to be more efficient than conventional on-site power systems.



Figure 2—Encorp selected the SEL-351 Directional Overcurrent and Reclosing Relay (shown above) to provide interconnection protection.

To protect the power system, Encorp selected microprocessor-based SEL-351 Directional Overcurrent and Reclosing Relays and SEL-300G Generator Relays from Schweitzer Engineering Laboratories, Inc. (SEL), Pullman, WA for their robust functions and features. A deciding feature was the Sequence of Events Recorder (SER) included with the SEL-351 and SEL-300G models, providing interconnection protection (32 U: Under Power, 81 O/U: Over-/Underfrequency, 51 V & 50/51 N: Voltage Restrained/Neutral Overcurrent, 27/59: Over-/Undervoltage, and 59 N: Neutral Overvoltage).

“We also found Schweitzer's SELOGIC® control equations quite useful in developing the algorithms and equations needed to set up the system,” says Dave Bishop, Encorp application engineer. “One reason we use the SEL-351 over competitive products is the flexibility with the logic.” The SEL-351 offers additional logic to integrate PLC functionality. For the CNP project, Pacific Gas & Electric required backup systems for microprocessor-based relays; Encorp elected to install redundant SEL-351 devices.

Encorp engineers connected the SEL-300G Generator Relay and both SEL-351 Relays via serial port to a system communications module that allows Encorp to dial in and view the relay settings and download sequential events reports. Being able to remotely access the relay saves time and travel and assists in the accuracy of troubleshooting power-system events.

A Safety Net for NOBEL/SYSCO

NOBEL/SYSCO needed a safety net to ensure power reliability, so the company installed two Cummins/Onan generator sets: a 750 kW DFHA and a 1500 kW DFLE—supplied by Cummins Rocky Mountain—to provide backup power in the event of a power outage. However, after talking to representatives at Xcel Energy, the local utility, NOBEL/SYSCO learned about the substantial cost savings possible through the utility's curtailable-rate program.

This innovative program allows Xcel Energy to periodically ask NOBEL/SYSCO to turn on its backup generators and draw power only from the generators—not the utility—during times of peak energy use. The program is a win-win situation for NOBEL/SYSCO and Xcel. NOBEL/SYSCO can reduce its utility bill by thousands of dollars each month (up to a 12 percent reduction each month). At the same time, Xcel can ensure that it has an additional 2 MW of electrical capacity available to serve customers during peak times.

To participate in the curtailable-rate program, however, NOBEL/SYSCO needed additional equipment to ensure a seamless transition from utility power to generator power. The company contracted with Encorp, to supply two automatic transfer switches (Encorp ATS 4000), which instantaneously transfer NOBEL/SYSCO's facility loads of 1,200 and 2,500 A to the generators and two Encorp Utility Power Controls™, which provide safe, reliable transfer between each generator and the utility grid. The Encorp equipment also ensures seamless transitions when it is time for NOBEL/SYSCO to return to utility power.

The technology-neutral Encorp equipment easily interfaces with an Andover Control system already in place at NOBEL/SYSCO. The Andover Control system is a complete building-automation system that monitors security, lighting, and other electrical services on site. To monitor and protect the system, Encorp installed SEL-351 Relays, which provide interconnection protection (32 R: Reverse Power, 50/51: Neutral Overcurrent, 67: Directional Current, 27/59: Over-/Undervoltage, 59N: Neutral Overvoltage and 25: Synchronism Check). With the Encorp equipment, NOBEL/SYSCO expects a quick return on investment thanks to the substantial energy savings. In addition, company officials are assured of reliable power to meet the company's demanding round-the-clock production schedule.

Making Power Systems Smarter

A key service Encorp is providing California Natural Products and other customers is its new Energy Management Center, a remote monitoring, alarming, and reporting service that ensures generators, engines, and other distributed energy assets used for standby, peak shaving, or cogeneration applications run at peak efficiency.

Encorp's Energy Management Center is a fully automated service that communicates with almost all intelligent genset devices, to collect data, provide alarm notification, and deliver critical power analysis for optimal decision-making. In effect, the Energy Management Center leverages the intelligence gained from devices, such as the SEL-300G Relays that protect, monitor, and control power generation systems, thereby making management of the entire system even "smarter."

Using nearly any form of connectivity—from a simple phone line to a T1 line—the Energy Management Center immediately alerts operators via email, pager, or text message if a problem arises with an on-site power system or when regular maintenance is scheduled. The Energy Management Center also offers limited predictive-maintenance capabilities to increase reliability and reduce downtime.

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About Encorp, Inc.

Among its many accomplishments in advanced power systems, Encorp was the recipient of the "2002 Project of the Year" Award at Power-Gen International in Orlando, December 2003, for its quick effort to commission two 50 MW California power plants in conjunction with NEO Corporation and Stewart and Stevenson.

Encorp develops and markets services, software, and hardware technology solutions for the communication, control, and networking of distributed energy. Encorp's technology-neutral solutions simplify and automate the control of a wide variety of

distributed energy resources, such as engine-generator sets, microturbines, fuel cells, combined heat and power (CHP or cogeneration), and energy storage devices—power resources that have become critical components in the operation of any enterprise that demands high-quality reliable power at reasonable and predictable costs. For more information contact Encorp Corporate Headquarters, 9351 Eastman Park Dr., Windsor, Colorado, 80550; Phone (888) 362-6771; Fax (970) 674-5399; Email sales@encorp.com; or visit the website at www.encorp.com.

About California Natural Products

California Natural Products is a 23-year-old company that produces a wide range of food ingredients—from conventional and organic rice, to syrups, flours, and sweeteners—for a variety of uses. For more information, contact California Natural Products, P.O. Box 1219, Lathrop, California, 95330; Phone (209) 858-2525; Email joe-hall@californianatural.com; or, visit the website: www.californianatural.com

About NOBEL/SYSCO

Denver-based NOBEL/SYSCO Food Services Company provides food and related products to restaurants, health-care and educational institutions, hotels and other food service operations in the Rocky Mountain region. NOBEL/SYSCO is a subsidiary of SYSCO (Systems and Services Company) with \$23.4 billion in sales for fiscal year 2002. For more information, contact NOBEL/SYSCO, 1101 West 48th Ave., Denver, Colorado, 80221; Phone (303) 458-4000.

About SEL

Schweitzer Engineering Laboratories, Inc. (SEL) has been making electric power safer, more reliable, and more economical since 1984. This ISO 9001:2000-certified company serves the electric power industry worldwide through the design, manufacture, supply, and support of products and services for power system protection, control, and monitoring. For more information, contact SEL, 2350 NE Hopkins Court, Pullman, WA 99163-5603; phone: (509) 332-1890; fax: (509) 332-7990; email: info@selinc.com; website: www.selinc.com.

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