



Photo courtesy of Waverly Light and Power

## THE WINDS OF CHANGE: WAVERLY LIGHT AND POWER - A PIONEER IN SUSTAINABLE ENERGY

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Waverly Light and Power™ is a city-owned electric utility providing service to almost 5,000 customers in a 33 square mile area located in the Northeast corner of Iowa, along the scenic Cedar River. Waverly Light and Power (WLP) has been leading the way in sustainable energy since the late 1980s when it was the first municipal utility to own and operate wind generation in the Midwest. As they are continually searching for environmentally friendly, renewable energy resources, wind has been an important resource—leading the way in providing a clean, emission-free, and inexhaustible energy resource.

### Response to Increased Energy Demand

During the late 1980s, Waverly's energy demand grew at a rate of 4.2% per year—almost twice the national average. Faced with termination of its purchased power contract in 1999 and steady growth in demand, WLP became increasingly concerned about future energy supplies. A study was performed by an independent utility consultant to evaluate options for conserving energy and generating it from renewable sources. The study showed wind to be a viable resource in Iowa.

In 1993, after receiving grants from the American Public Power Association, Waverly Light and Power erected Skeets 1, the first turbine, located on a farm just outside of Waverly (Zond 80 kW), and according to Glenn Cannon, former General Manager of WLP, “became the first public power system in the Midwest to own and operate wind generation.”

Positive response from local consumers,

a grant from the National Renewable Energy Laboratory, and the success of the original turbine lead to additional turbines. In 1999, two 750 kW Zond Z-50 wind turbines, Skeets 2 and 3, were placed on small farms near Alta, Iowa. They are part of the Storm Lake Wind Facility which contains 259 wind turbines.

Late in 2001, Skeets 1 was retired and replaced with a 900 kW turbine. The NEG Micon NM52 turbine came on-line in December 18, 2001, and produced over 111,000 kWh through January 1, 2002. The production during those 15 days was greater than the previous turbine, ‘Skeets 1,’ produced in an average year.

In order to ensure future reliability, two of WLP's wind turbines were sold in November 2005. The selling of these two units allowed Waverly Light and Power to continue researching and investing in turbine and wind renewable upgrades. Two additional turbines are planned for installation in 2009.

### Innovative Program

Waverly Light and Power Iowa Energy Tags™ program was launched in March of 2001. This innovative program allows companies and individuals to purchase tax-deductible certificates (tags) to help pay for future renewable energy resources. Iowa Energy Tags have been purchased worldwide. From Denmark to Waverly, residents realize the value in the Iowa Energy Tags program.

Each tag represents the environmental benefit of 2,500 kWh of wind generation, offsetting fossil fuel production and importation of the same amount of energy. This means a savings

of 5,300 lbs. of CO<sub>2</sub> emissions—along with a host of other greenhouse gases—for each Iowa Energy Tag sold.

### Envirotemp Transformers and FR3 Fluid

In 1992, Cooper Power Systems began research and development of vegetable oil-based transformer fluids. In 1996, the first field trials began, and a soy oil-based dielectric coolant, trademarked Envirotemp FR3 fluid, was commercialized in 1999. Also forward thinking, Waverly Light and Power, in cooperation with the University of Northern Iowa's Agriculture-Based Industrial Lubricants (ABIL) Laboratory, developed a soybean-based transformer oil. In 2002, their technology was acquired by Cargill, Inc. In 2004, Cooper and Cargill formed an alliance to transfer the production of FR3 fluid to Cargill Industrial Oils and Lubricant facility in Chicago to take advantage of their larger manufacturing base. Waverly Light and Power continues to support and promote the sale of FR3 fluid. Cooper Power Systems developed a line of transformers, Envirotran transformers, that solely use FR3 fluid. WLP uses FR3 fluid exclusively for both new and retrofit applications to support their commitment to the environment. In September of 2007, WLP purchased two 1000 kVA Envirotran 3-phase pad-mounted transformers, connective equipment including inserts and bushing wells, and Bayonet fuses to be used with two new wind turbines to be installed in early 2009.

### Exceeded Expectations

Today, Waverly Light and Power's wind generation serves the

equivalent of 261 homes annually. It also offsets nearly 2,330 tons of carbon dioxide (CO<sub>2</sub>), a leading greenhouse gas associated with climate change. Renewable generation contributes 3% to their total generation portfolio annually. In May of 2002, NEG Micon USA, Inc., stated Waverly's wind turbine was among the highest producers for NEG Micon turbines in the United States. "It was the highest producer of all NEG Micon turbines in the Midwest in May," said Steve Butler, Technical Services Advisor for Waverly Light and Power. The Utility had an estimated capacity factor of 27% annually, but to-date it has averaged 32.5%.

### Commitment to Future Development

Through the strong leadership of the WLP Board of Trustees, Waverly Light and Power has maintained its position as an industry leader in renewable energy and energy efficiency over the years. In 2006, the Board committed to make renewable resources the source for 20% of WLP's system energy requirements by the year 2020. This commitment has reaffirmed WLP's position at the threshold of energy markets for the next century. New options are currently being pursued in this visionary effort. Cooper Power Systems has been developing new and exciting equipment to help WLP and other utilities meet the ever increasing demands for safer, environmentally friendly, and more efficient transformers. ■

*For more on Cooper Power Systems proactive approach to meeting the requirements of the Department of Energy standard while incorporating innovative FR3 fluid to provide utilities with "green" energy-efficient transformers, please read: Cooper Provides Utilities DOE 2010 Standard-Efficient Designs by Jim Kozak, PE.*

## Efficiency in the field starts with training in the classroom.

Cooper Power Systems' training program improves operator performance, increases efficiency, and optimizes equipment operation. For product training information, visit:

[www.cooperpower.com/EventCalendar](http://www.cooperpower.com/EventCalendar)  
[www.cybertec.com/training](http://www.cybertec.com/training)



## CABLE PREPARATION AND TERMINATION TRAINING

Ken Easterday, Product Specialist, LiPE - C&I – Cooper Power Systems

The need for lower-cost medium-voltage installations, in an extremely competitive contract environment, which is under short time constraints—all of these issues are running through the minds of Cooper Power Systems customers. Also of importance, but at times overlooked, is the need for experienced and trained cable and termination installers. No matter who the customer, the location of the installation, or the application, there is potential that the contracted installers are new to the project and they may have very little experience with proper medium-voltage cable preparation. Cable Preparation and Termination Training (CPTT) is not only needed, but sometimes required, depending on the end customer.

Since cable preparation training needs have become more frequent, some Cooper representatives have filled the need and conducted these training events themselves. Michael McClellan, Jr., of Haddon-McClellan Associates, Inc., looks to provide CPTT for his customers with medium to large cable accessory orders. "We provide cable training because it is necessary to support the sale, solidify the customer relationship, and provide customer service for both Haddon-McClellan Associates, Inc., and Cooper Power Systems," says McClellan. "We

usually provide 3 to 4 training sessions per year." In addition, McClellan mentions "It's a great opportunity to talk to the customers about the tools needed for the preparation and perhaps get clarification."

Another Cooper representative, Rick Denno, from RM Clark Associates, Inc., uses CPTT as an opportunity to get Cooper cable accessories in front of potential customers. "I talk to them about separable connectors, and then we all go through the CPTT. Five times out of ten, it results in added requirements for loadbreak elbows, junctions, splices, and sector cabinets. I call on several large government campuses that require their contractors to have training before they can work on MV terminations. This is a good opportunity to get Cooper in front of them, provide CPTT, as well as a certificate of training."

Cooper Power Systems can provide a certificate of completion for all CPTT that includes a Cooper logo, description of the training, the location, and a signature of the person performing the training.

In addition, Cooper will be introducing a 200 A and 600 A CPTT training video on DVD that covers the latest techniques and tools for proper cable preparation and terminations. Look for this DVD in the summer of 2008. ■