

# BUILDING A STRUCTURE FOR SAFETY

Suzlon and Duke Energy discover that collaboration, empowerment, and vigilance are key to developing a successful culture of wind-farm safety.

By Bryan Stewart and John Valerius



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**IN LATE 2011, DUKE ENERGY'S** commercial businesses presented the President's Safety Leadership Award to the joint Duke Energy Renewables and Suzlon Wind Energy site team at the 29-megawatt Happy Jack and 42-megawatt Silver Sage wind farms near Cheyenne, Wyoming. Traditionally bestowed upon the operations teams at one of Duke Energy's unregulated conventional power plants, this award recognized the exceptional team effort that took the sites' safety performance to new heights in 2010.

In the narrative that follows, Bryan Stewart and John Valerius—Suzlon Wind Energy and Duke En-

ergy Renewables' respective site leads—share the lessons they learned along the way in the hope that they may aid operators at other wind farms throughout the industry.

## THE EVOLUTION AND THE GOAL

The Happy Jack Windpower Project, which reached commercial operation in 2008, was Duke Energy Renewables' first wholly-owned commercial wind project. It is located in Laramie County, due west of Cheyenne. The adjacent Silver Sage Windpower Project came online in 2009. The sites are owned and operated by Duke Energy Renewables, which



**Fig. 1: Arch flash gear buddy check at left. Suzlon and Duke Energy team members, above (photo credit: Suzlon).**

tion continues to evolve, but the goal remains the same: create and continually enhance a zero-injury and illness culture, one in which the responsibility for hazard identification and mitigation is shared equally among all team members and everyone feels empowered to prevent accidents.

### **LESSON 1: SAFETY FIRST**

It takes more than perfunctory “safety moment” sharing and hardhat stickers to ensure employees and contractors make safety their top priority. To create a viable safety culture, site leaders first identified the unique strengths of each company and exchanged lessons learned at other power generation facilities. Many of the Duke team members relied upon their experiences designing, building, and operating fossil-fueled and hydroelectric power plants to ensure the wind farms leveraged best safety practices. This “utility mindset” encouraged rigorous standardization and measurement—two operational characteristics that are not always commonplace throughout the developing renewable energy industry.

Suzlon Wind Energy’s intense focus on leading by example helped shape the way Happy Jack and Silver Sage site managers model the safety traits and behaviors they expect every employee and contractor to demonstrate each day. Specifically, Suzlon’s “Leading with Safety” training course provides managers with the tools and techniques they need to ensure safety remains the top priority, including recognition and reward mechanisms, employee engagement programs, and documentation templates to track key performance indicators. Leaders are held fully accountable for things that they can control and influence, including conducting safety meetings, inspections, and safety audits.

has an onsite team that oversees balance-of-plant operations and general site management. Suzlon Wind Energy oversees the maintenance of the sites’ 34, 2.1MW Suzlon turbines under a five-year full service agreement.

Productive partnerships require hard work, communication, and trust. From the beginning, site leaders from the companies sought to transform Happy Jack and Silver Sage into working laboratories where tried-and-true best practices and innovative ideas could be developed into safety protocols designed to protect both the workers and equipment at the two wind farms. Our collabora-



Fig. 2: Pre-job safety briefing (Suzlon).

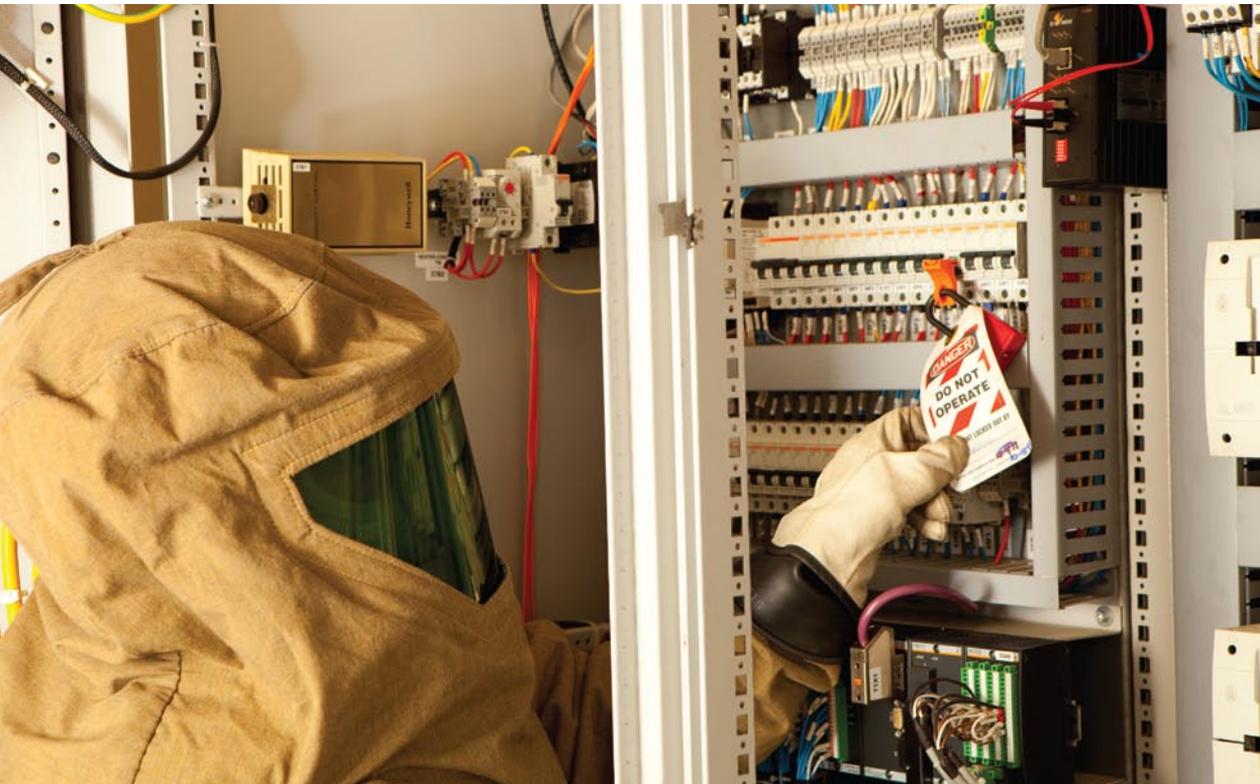


Fig. 3: Performance of lock out tag out (Suzlon).



Fig. 4: Ladder rescue drill (Suzlon).

## LESSON 2: COMMUNICATION IS KEY

Open and candid lines of communication have also been critical to our success. Our joint team of 10 full-time staff members at the two wind farms conducts weekly safety briefings and delves deeply into topics such as turbine ladder accident prevention; slip, trip, and fall avoidance; and body stress mitigation techniques to counter working in extreme temperatures. At one point in 2010 we documented and analyzed a pattern of dropped tools at both sites. Brainstorming led to the implementation of a new training program that equips technicians with step-by-step guidance on how to properly handle certain types of tools during maintenance exercises. We reinforced the key aspects of the training program through new signage and message reinforcement at team meetings.

## LESSON 3: NO FAULT SAFETY HAZARD IDENTIFICATION

To truly create a sustainable culture of safety, all site workers must feel empowered to identify and communicate potential hazards without fear of retribution for hampering operations. This concept is at the core of our shared safety philosophy. No matter who raises a safety concern, we work together to develop the solution.

For instance, the two companies' employees jointly hold monthly fire inspections and hazard

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**Fig. 5: Recovery position for rescued person (Suzlon).**

identification walkthroughs at Happy Jack and Silver Sage. The individuals responsible for conducting the inspections are rotated each month so that fresh eyes can uncover both obvious and subtle risks. In 2010, these site employees and contractors identified and addressed a number of seemingly minor but potentially harmful issues, including trip hazards from empty pallets and fire hazards from daisy-chained extension cords and fraying wires.

#### **LESSON 4: SAFETY EVERY DAY**

We developed a Job Safety Analysis (JSA) template for technicians to complete before each tower climb to ensure that safety remains at the forefront of everyday operations. At the beginning of our partnership, Suzlon's employees shared their company's wind safety procedures with Duke Energy Renewables employees. In turn, Duke's employees provided safety procedures originally developed for Duke Energy's sizable fleet of coal-fired power plants. Although it is impossible to guarantee that accidents will not happen, the JSA provides our technicians with a thought-provoking regimen that reinforces the importance of doing a job safely, not just quickly.

#### **LESSON 5: LEVERAGING EXPERIENCE**

A meaningful commitment to safety must involve innovation. This occurs by thinking about problems in



**Fig. 6: Duke Energy Renewable Safety Cup (Duke Energy).**

new ways, and also by leveraging team members' diverse experiences and skill sets. For example, John once served as a firefighter and emergency medical technician. We incorporated prevention and treatment techniques common to those professions into our site readiness and response plans. Happy Jack and Silver Sage purchased a compact backboard—often used by EMTs at the scene of an accident or crisis—and adapted it for high-angle wind turbine tower rescues. This makes it far easier to secure an injured individual in a confined space and lower them safely to the ground. John's emergency medical response experience also led us to create medical trauma bags customized to meet the potential needs of wind farm technicians. Fortunately, we have not yet had the need to

put these tools into service in a real emergency. Having them on hand, however, means our workers are trained and better prepared to contend with a great range of crises that might confront the operators of a large-scale wind farm.

Another example: Both companies rely upon their respective meteorological expertise to identify and mitigate weather-related hazards. Meteorologists from both companies send automated and customized text messages to wind farm workers if the weather appears likely to take a dangerous turn. This ensures that our employees and contractors will have adequate time to suspend their activities and evacuate if necessary.

### SPREADING THE WORD

We believe the lessons we have learned and best practices we have developed through our partnership at the Happy Jack and Silver Sage wind farms in Wyoming can help leaders at other wind farms refine their safety protocols and programs. We regularly share these lessons and practices at other Duke Energy and Suzlon sites, and ask for their ideas in return. On numerous occasions, industry peers have generously provided us with food for thought related to safety excellence. In addition, both companies serve on the American Wind Energy Association's Environmental Health & Safety Committee, which has proven to be an insightful forum in which to exchange information.

Although we are proud of our joint safety accomplishments, we know we can never rest on our laurels. Safety hazards are inherent in our line of work. When it comes to identifying and mitigating the risks that pose harm, our employees and our assets, vigilance, and creativity are essential. ✨



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