

Such is the good safety record for workers in wind power compared with other industries that American health authorities are satisfied with the industry's ability to police itself under existing general standards. Safety is part and parcel of rigorous training programs for all field technicians

FOSTERING A CULTURE OF SAFETY

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Four years of a record-breaking American wind market boom have ushered in an unprecedented rush to find enough qualified workers to join the tower-climbing ranks. That, in turn, has aimed a widening spotlight on the parameters of safety in an American industry with no formal guidelines, no specific edicts from the federal government, no system to report incident statistics as public record—and no immediate plans to change the current working conditions.

As increasing numbers of new workers come aboard each year, the wind industry considers itself remarkably, if anecdotally, safe—especially compared to workforces in the traditional power generating industry and mines or those that build and maintain telecommunications towers and transmission lines. With hundreds of job openings that require a disciplined mountain-climber's mentality, along with highly specialised skills—physical, mechanical, electrical, technical and otherwise—the comparatively good safety record is a positive recruiting factor.

“The hazards we have to work with are really no different than working at a lot of other places,” says Gary LeMoine of Iberdrola Renewables, who has served as vice-chairman of the American Wind Energy Association (AWEA) safety committee for nearly three years. “In a lot of ways, it's actually simpler technology. For all the complexity and computer controls, a combustion turbine

plant and a big coal fired plant have many more hazards than a wind plant. We don't have to worry about combustible coal dust or high-pressure natural gas lines and lots of other chemical lines—we don't have any of that.”

The US Department of Labor's Occupational Safety & Health Administration (OSHA) seems to agree. After much industry speculation over the pros and cons of any new regulations aimed squarely at wind power that the federal agency might be ready to impose, no such pronouncements are on the horizon. “We think that we have plenty of applicable standards in place already that apply to the wind power industry,” says OSHA's Bill Parsons.

INFORMAL COLLABORATION

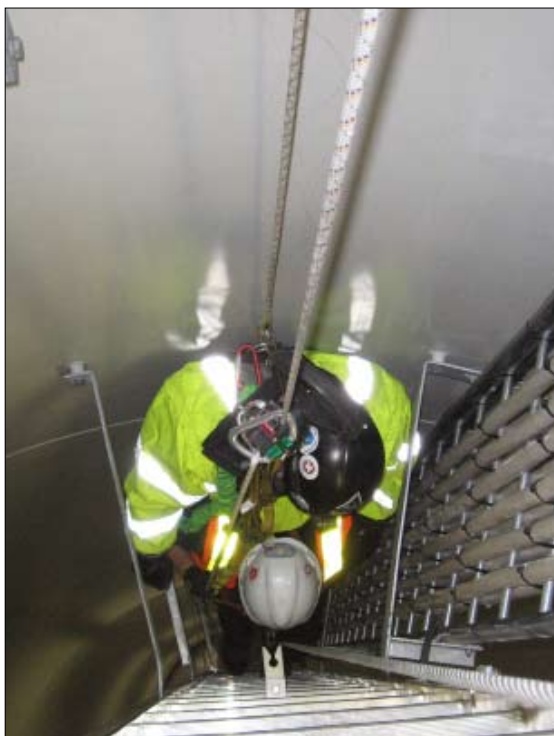
According to LeMoine, safety issues are an area in which competing companies in the wind industry are prepared to collaborate. He says they are sharing more safety information than ever before—through channels such as committees, seminars, conferences, emails and online chat rooms. He believes that not only do the major companies have excellent safety records, they are also self-motivated to keep it that way. Black eyes are expensive.

Companies keep incident statistics, but have no formal system for sharing them across the industry. “There's not a number where everybody submits all their data to OSHA and you can say: that's wind and that's their statistics,” LeMoine says. “We're blended in with the electric industry, so we don't have separate statistics from them. But if we do the right things and keep people safe, the numbers will follow.”

OSHA seems to have no problem with that line of thinking. Among other reasons, guidelines can be expensive to enforce. “I can't really say that OSHA has looked at the industry and said we don't know if we are or are not getting what we should be getting from the industry,” Parsons says. “We view it as us working with the industry to build a working relationship and to build a good guidance for that industry.”

Still, few would deny that building an ongoing culture of safety into a relatively new and rapidly expanding industry is a challenge. AWEA estimates a need for more than 75,000 positions to operate, maintain and manage the installed US wind fleet by 2030. LeMoine points out that the wind business starts out with a built-in advantage: it is inheriting a large number of first-generation workers directly from utility and other related industries, where the safety culture has been ingrained over many decades. Even so, maintaining safety standards among new entrants to the workplace will require vigilance. “New workers need to be brought up to speed. It definitely is going to be a challenge to ensure that safety practices are developed and followed,” says LeMoine.

While many companies have their own training pro-



Don't let go: Safety training not for the faint-hearted



Highflyer: A Columbia Gorge Community College student learns how to work safely on top of a turbine at Klondike Wind Farm

grams for new hires, the industry typically brings recruits up to speed through courses run by operations and maintenance (O&M) firms. Fledgling workers are put through rigorous general training before returning to the companies that hired them to gain more specialised skills.

TRAINING

One such pre-program is offered by Energy Maintenance Service (EMS) in South Dakota, the operations and maintenance arm of Broadwind Energy. According to EMS's Barry Morris, all new recruits start with 40 hours of practical classroom training before they are allowed to go near a wind plant. Course-work begins with everything from cardio-pulmonary resuscitation (CPR) and first aid training to basic equipment and terminology. Recruits also get ten hours of OSHA safety training before spending two days on fall protection and learning how to wear, maintain and inspect harnesses. Two days on four metre ladders come next, followed by a climb test and emergency descent training. Then applicants move on to specific tools of the trade, while learning about torque, tensioning and rigging before they take a 36 metre-climbing test to validate their status as hopefuls.

"It's a pretty extensive week," Morris says. "I've had a lot of different demographics go through that class from someone who's been in the wind industry for five or six years to somebody that just came out of residential construction and never worked at heights. Without a doubt at the end of that week they're confident that they can go out and work safely."

But EMS's training does not necessarily end there. The company's own recruits train for 90 additional days



People first: Learning first aid skills in the classroom

on the job site with an experienced worker to learn such workaday basics as emergency response contacts and locations, local logistics, severe weather procedures, site maps and area speed limits for driving. At last they reach the bottom of the turbine, where they are versed on control systems, production data and fault logs, high-voltage hazards, lockout/tagout procedures, ladder systems and safety cables.

"Once they've gone through that, they're taken up tower," says Morris. "They're shown how to transition from the yaw deck into the nacelle and then they're shown the entanglement hazards, the emergency stops and the rotor locking systems. The point is that it's all part of the training process just to be able to go out and work safely."

Morris encounters many experienced workers going

through refresher training programs. "I always pull them off to the side and ask them to give me some feedback on what we're doing here because we can always get better," he says. "The response is always: gosh, I wish I would have had this when I first started."

SAFETY EQUIPMENT

Capital Safety, a global company with US headquarters in Minnesota, manufactures confined-space and fall-protection equipment in addition to providing a wide variety of industry-specific safety training. One problem that Capital Safety must overcome on the manufacturing side is making safety equipment that complies with regulations, not only in the US, but also in Canada, Europe, Australia, Russia, Singapore and China, among others. Simple things such as wear and tear on harnesses from leaning back on abrasive tower walls during descent must be considered during design, manufacture, and training.

"It's essentially down to ourselves and the industry working with us," says Steve Jervis, who has been with Capital Safety for a decade. "The guys who are in the in-

*Workers have
to know that
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STEVE JERVIS,
CAPITAL SAFETY

dustry really do understand what their requirements are for each international regulation. They understand it, we understand it and between us we come up with solutions."

The company also runs a range of training courses dedicated to the wind industry. "We've developed them in conjunction with companies like Vestas," Jervis says. "We've actually just completed a series of courses in the Far East for Vestas employees."

Jervis says Capital Safety's trainers are booked solid through to the middle of next year. "Our training army is expanding ridiculously quickly," he says, noting that more experienced hands train

the trainers. Sending trainers off to learn and compare protocol in related industries gives them valuable background experience and knowledge.

"They've gone on construction sites to learn how the construction people work. They go into oil fields to learn how the oil and gas people work. We've got them going up wind turbines to learn how construction occurs, how the maintenance guys work and so on. We also bring in industry specialists who advise us on course content and

TURNING OUT WIND POWER GRADUATES

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Two year training programs for potential wind farm technicians are popping up at colleges throughout the United States to provide a pool of pre-trained operations and maintenance graduates who know the basics and can be easily fine-tuned in the specifics that companies require. As many as 20 programs are either up and running or are coming soon in states as disparate as Texas, California, Arizona, Wyoming and New York. Worker safety is a key element of all the programs.

Al Zeitz, a wind industry veteran who has moved into teaching, developed an early pioneering program at Iowa Lakes Community College (ILCC) in Estherville in 2004. ILCC's courses currently turn out some 40 wind graduates each year, but Zeitz would like to see that number increase to 100 or more.

"One of the first things we hit on in the program is the safety end of it," he says. "And within the safety realm, climbing that turbine is the most important thing. We just tack things on after that."

Zeitz believes some sort of accreditation system would help the new programs gain credibility. Short of that, however, instructors with real-life experience are prov-

ing effective magnets for pulling in students. "I've been bombarded by phone calls and emails wanting that magic touch that they could give to their program to make it successful," Zeitz says, referring to the operators of start-up commercial training courses. "I tell everybody they need to have someone onboard with field experience. In my mind, that's the number one priority."

ILCC uses a pair of donated turbines for training and the school has received money from both the wind industry and the federal government. Zeitz is appreciative but believes the industry and government could do more. ILCC recently completed a facilities expansion and is close to signing an agreement with a university where graduates of its two-year courses could transfer smoothly into an engineering program.

DESIGNING FOR SAFETY

Zeitz believes such advances will eventually lead to safety taking on an increasing role with regard to turbine design. "That's been a problem in the past," he says. "The engineers do a very good job of designing a streamlined enclosure for the nacelle and all that. But, unfortunately, some parts were put in places where it was extremely difficult to replace them."

A wind program established last year

at Columbia Gorge Community College (CGCC) in The Dalles, Oregon, includes a six-month pilot course, a first-year certificate and a two-year degree in renewable energy technology. The school, which currently has three instructors, is recruiting a fourth, adding two new buildings and received financial backing from several companies and the state government. Wind farm owner Iberdrola has granted the school access to a turbine at its nearby Klondike Wind Farm.

The program admits 68 students a year, says Tom Lieurance, lead renewable energy instructor at CGCC. "I'd like to be turning out well over 200 a year," Lieurance says. "But I can't see getting there. We still won't have enough room to do that."

In late June, CGCC hosted a seminar attended by administrators from 17 colleges, including seven with established wind programs, along with representatives of a handful of major developers, operations and maintenance companies and turbine manufacturers. "We called it the summer institute," Lieurance says. "The purpose was to create a first-year curriculum for colleges interested in developing a wind program. Demand is so great that even if we got 20 new colleges involved, it still wouldn't be competition for us."



Safety in numbers: Recruits in training by Energy Maintenance Services

work with our trainers to develop the courses to properly suit the market,” says Jervis.

In addition to safety equipment training, Capital Safety emphasises rope access, specialist rescue, breathing apparatus, first aid and CPR. Jervis admits that climbing and descending the towers can sometimes be more arduous than the actual work performed in a turbine. “But with every single thing that can possibly go wrong, workers have to know that the guy they’re working with can save their life,” Jervis says. “You’re 300 feet in the air and there’s you and somebody else. The only person you can rely on to keep you alive until you can be gotten down or the emergency services can get up to you is the guy that’s with you. So you get yourself trained to the highest standard and so does the guy that’s with you.”

SALARIES

Jervis recognises the industry cannot produce qualified employees—workers or trainers—fast enough. “Every single inch of this globe has that problem right now,” he says. “It’s a mushroom cloud that’s just got to the mushroom stage.” Even so, few if any projects in America are serviced by workers who have not been through extensive safety training, simply because projects large and small are maintained by the same people. “You may have a small wind farm, but the maintenance and operations contract will be linked up with somebody who specialises in that machine on a national or multi-state basis,” Jervis says. “What you find is you’ll have a guy come from Denmark who will fly into Minneapolis and he will go through Minnesota and the Dakotas, working with a team of an-

other eight people who are either from Denmark and come with him or are based in the US. And they’ll do maintenance on all the Vestas sites around those states.”

Salaries vary, but typically start at around \$40,000 a year, can reach \$60,000 quickly and often go much higher—especially with overtime and weekend pay. Pre-employment and drug testing is standard procedure for most wind-related companies, but not required by law. The work itself is demanding by definition as workers climb two to four or more towers each day. Fully trained workers are a prized commodity.

“It’s very competitive,” says EMS’s Morris. “There are companies like Enxco and Run Energy and Upwind Solutions that do a lot of the same things that we do. If you’ve been in the wind industry, you’re a valued asset. And for some guys, the grass is always greener on the other side, so they’ll leave for a dollar more somewhere else.”

That can be especially true as the first wave of aging workers begins to grow tired of the daily tower-climbing grind and migrates toward office jobs or less-demanding industries. The next wave of employees must come from somewhere. Many good candidates come from the military, along with traditional construction sectors and other parts of the energy industry. Women are increasingly joining the ranks and at least one husband-and-wife team has begun training. College-based training programs are also ramping up to feed at least partially trained workers into the industry (box page 76).

WORKING ON GUIDELINES

Meanwhile, AWEA would like to follow in the footsteps of the British Wind Energy Association, which together with its members has developed a series of best practice guidelines. Though not enforceable, the guidelines put safety precepts down on paper. But they are specific to the UK and do not necessarily transfer to the US industry, as the two countries have vast differences in regulatory requirements. Still, some say the UK guidelines may eventually benefit the US offshore wind industry, although no such projects are yet being built.

Nothing in the way of concrete US guidelines is expected until next year at the earliest. “It’s been the goal of the safety committee to develop the guidelines,” says the association’s safety point-man, John Dunlop. “Although it’s not as far along in the process as it should be.”

Even so, as the US looks forward to an increasingly frenzied future with bigger turbines, taller towers, innovations such as mechanised climbing devices, highly sophisticated computers and an ever-growing need for qualified workers, Dunlop is among many convinced that the industry is bound to continue along what has been a very safe and self-directed path. “I think a major issue is the perception of safety,” says Dunlop. “I think there’s a presumption that there must be problems but the consensus among insiders is that that is not true.”