SUCCESSFUL RESCUES ARE NO ACCIDENT

Examining the essential elements of a successful rescue plan.

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WHILE TIGHTENING AN OVERSIZED BOLT on a wind turbine, something slips and a technician's hand is crushed and bleeding. He loses consciousness. The second technician of this two-man team is now facing every team's worst nightmare.

Both team members have been trained for such situations. But — as is too often the case in the real world — there is no rescue kit on the platform. The uninjured technician knows that there is a rescue kit in the service truck on the ground. He calls for help and leaves his injured teammate for nearly ten minutes to retrieve the kit. Returning, he attends to the victim and waits for emergency personnel to arrive.

Fabricated, exaggerated story to illustrate a point? Or, real world experience?

Unfortunately, it's the latter. This really happened.

Because the second technician was not injured, his primary responsibility was to stabilize the victim as quickly as possible. During those ten minutes he was gone, the victim could have gone into shock, required CPR, or worse. After calling for help, he needed to be there to attend to his co-worker while waiting for assistance. Despite advance training, no one gets smarter during an emergency. The second

worker was most likely trained in how to assess the situation, and efficiently and effectively use the rescue kit. But, the kit wasn't there. Leaving the kit at ground level rendered it useless and abandoning the victim — even for ten minutes — exposed him to any number of possible hazards.

SHIFTING GEARS

In an emergency scenario, if the response is to be effective, it must be based on speed.

- How fast the teammate addresses the victim.
- How quickly the call for outside assistance is made.
- How quickly the attending technician can access the proper equipment and implement it as needed.
- How quickly the victim can be returned to the ground where emergency personnel can begin their duties.

Throughout this entire scenario, urgency is a primary concern. Even the word emergency denotes immediate action. Unfortunately, when the rescue equipment isn't there — as was the case in our opening narrative — speed grinds to a halt.

Accessibility of rescue equipment seems like a simple concept, but in the crush and rush of the real world, this doesn't always happen. Most wind farms have kits available — in the nacelles, in trucks, in support buildings, etc. While that's all well and good, these kits need to be where the workers are which reinforces the need for redundancy.

With one kit on the ground and one in the nacelle, tower technicians now have greatly maximized their chances for quick, efficient and successful rescue. In fact, "prompt rescue" is explicitly stated in OSHA's guidelines.

A comprehensive approach to successful, speedy rescues must address a degree of self-reliance on the part of the technicians; training those technicians in the quick and appropriate response to rescue situations; and, having the proper equipment.

REACHING NEW HEIGHTS

A wind tower is a work environment that is fraught with challenges. With most turbines reaching as high as 100 meters, first and foremost is the issue of height. In addition, as the technicians in our opening scenario showed, personnel working on turbines typically have to deal with extremely tight work spaces which can be difficult to access. What's more, while exposed, wind turbine personnel must deal with the weather related elements of heat, cold, rain, snow, ice and, of course, wind.

Individually these issues each pose their own respective problems, but combined, they present a situation where extraordinary planning, training and ultimately executing the response can mean the difference between life and death.

Prevention is only half the equation for keeping technicians safe at heights. The other half is rescue — an equally important need. Getting the technician safely to the ground quickly and efficiently minimizes the threat of suspension trauma or additional injuries.

This includes self rescue and assisted rescue as well as team-based evacuation. When there is an emergency, each technician's primary concern should be his own safety and then the safety of those around him. This is identical to the airlines' admonitions to secure your own oxygen mask before as-

sisting others. When working in pairs — as most wind turbine technicians do — the uninjured technician must assure his own viability before attending to the victim.

This dynamic safety assessment requires that the rescuer rate the risk of potential dangers to determine what is the lowest level of risk they can achieve while securing a safe outcome.

- A low risk situation is one where the affected technician can lower himself. This can range from using a controlled descent device to something as simple as climbing back down the ladder.
- A medium risk situation is one that demands that an incapacitated worker descends suspended by life-safety ropes while being lowered to the ground.
- The worst risk situation is one where both the victim and the rescuer are fully exposed to the same potential hazards and must be rappelled back to the ground.

For those low-risk emergencies, self rescue is the safest and most efficient option. Trained technicians with the proper equipment can make that happen. No additional resources are required and there is no waiting to be rescued. Although circumstances will dictate a lot, typically assisted rescue takes more time and is less efficient.

Fully understanding this hierarchy of risk is achievable through regular training. Either way, it requires a trained team and the right equipment. And, it's imperative that the equipment is readily accessible and appropriate for the work environment. Once again, accessibility translates into redundancy.

Because the common thread that dominates all rescue is the need for speed, relying on local emergency crews may not be enough. Many wind farms are located in remote areas where even the most responsive emergency crews may not be able to arrive fast enough to prevent additional injuries. What's more, local emergency services may not be trained in technical rescue at height and they are not likely to have the most efficient rescue strategies or equipment.

Consider the injured technician in a post-fall, suspended situation. These individuals become susceptible to suspension trauma that may result in loss of consciousness, blood pooling and other conditions which can result in irreversible damage and can occur in as little as 20 minutes.

Dangers such as these must be addressed quickly to prevent additional injuries. According to OSHA, some of the conditions that can result from suspension trauma include: hypothermia, palpitations, nausea and shock as well as cardiac arrest.

HAVING THE TOOLS

To adequately address the need for speed, having the right equipment can make the difference between a successful rescue and an ineffectual attempt that poses extraordinary risks for the victim.

Obviously, the first step is having access to the equipment: on site, on the truck, on the platform. Redundancy is a critical component of a speedy response. Best case scenario — your rescue equipment is versatile enough to be used for all emergency risk levels without being too cumbersome or adding additional weight.

Just as important is maintaining the equipment to ensure that all the necessary components are there and in working order. A complete, pre-packaged kit includes no less than a controlled descent device and technical rope rated for at least 300-foot descents as well as the connectors and other hardware for rescue rigging.

Beyond availability, another aspect of redundancy is the idea of making your rescues fail safe — ensuring the ultimate in safety during an emergency rescue. Descending 300 feet or more on a single rope leaves a victim susceptible to twisting or swaying which can result in additional injury. Also, even the best technical rope can fail. Having a back-up descent system and rope greatly increases the likelihood of a safe descent and is recommended by ANSI standards.

As for the equipment itself, great strides have been made in recent years in the quality, reliability, efficiency, versatility and adaptability of rescue equipment and techniques. When evaluating rescue equipment, be certain that your kits are quick and easy to rig and deploy. Rescue kits should also be sufficiently lightweight so as to make them easily transportable to ensure that they can be at hand whenever and wherever needed.

Today's kits contain ropes, descent devices and connectors that have been specially developed to be, not only lightweight, but also stronger and safer. What's

more, look for descent systems that are not susceptible to free fall if used improperly.

There are rescue kits available in today's market that have been especially designed for the wind turbine environment. DEUS Rescue has developed tower escape and rescue kits with a micro descender and fire-rated rope. These kits are compact, lightweight and easy to deploy.

Also, companies should insist on rescue systems that are so intuitive as to be nearly fool proof. This can be immeasurably important when technicians find themselves in the stressful, mistake-prone atmosphere of an accident or if the victim is unconscious, or if a hands-free descent becomes necessary.

LEARNING CURVE

Even with the right equipment available, the need for speed demands that the individuals involved must be trained in the efficient and effective use of that equipment. The first step in training is choosing a kit that is designed to be intuitive so that when your technicians are trained they will be more likely to retain that training. Likewise, the training programs must be designed to conform to the environments and conditions in which they will be used.

Despite all the technical improvements in the rescue kits and even with standard training sessions at 16-24 hours, trainers are under a lot of pressure to get everything covered and covered well. When training is frequent and effective, quick response becomes second nature.

Allowing for changes in job requirements as well as changes and improvements in equipment, most workers are now trained every two years with refresher sessions held intermittently as needed. Experience has shown that scenario-based training has been proven to be very effective. Trainees are presented with real-world case studies and how to speedily and securely affect the rescue.

IT TAKES PLANNING

The good news is that the safety culture of the wind industry is relatively good. Wind farm owners and operators are generally in compliance with OSHA rules and requirements for emergency response plans. Those rules state, "An emergency action plan must be in writing, kept in the workplace and available for employees to review... The employer shall review upon assignment of (each) employee what they must know to protect themselves in the event of emergency."

Typically, emergency response plans include: reporting (incident notification), escape procedures and escape routes, safely securing workplace, accountability, rescue and medical duties, types of evacuation and post-incident follow up.

While fall protection plans and emergency response plans may be somewhat common, what's notably missing is the written equipment management program. These plans should call for annual inspections of all rescue equipment and assurances that emergency response plans are present on every truck on the farm as well as on work levels.

When all is said and done, it's all about protecting the technicians who work on the turbines. To accomplish this requires an approach to emergency response that is built around speed and features the total package: redundancy, proper equipment, thorough training and comprehensive planning.