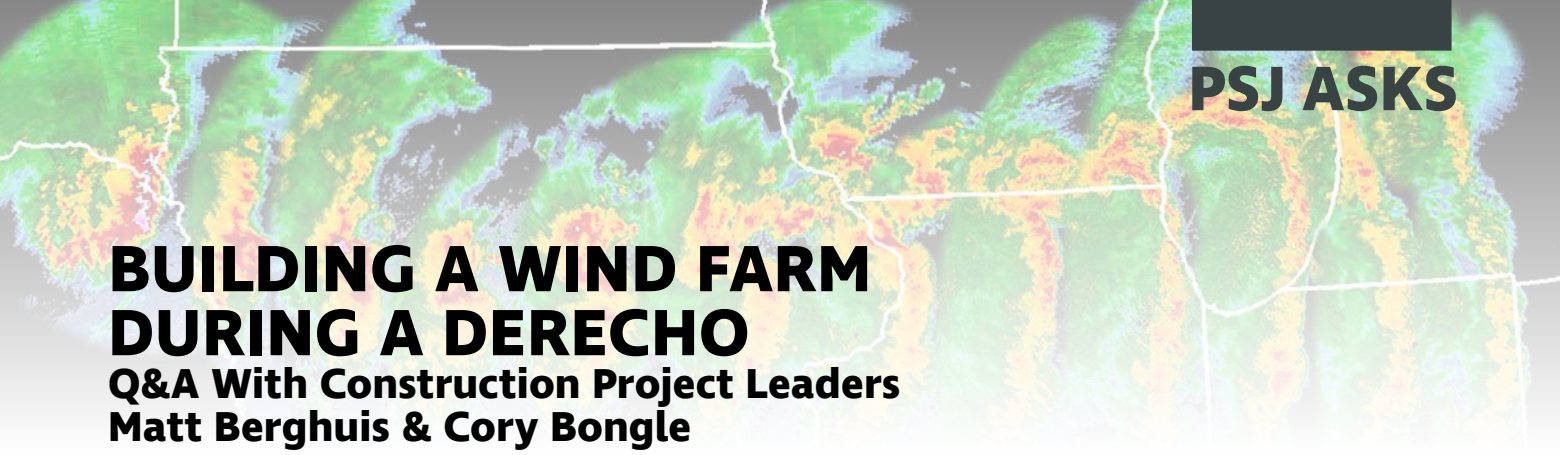


BUILDING A WIND FARM DURING A DERECHO

Q&A With Construction Project Leaders Matt Berghuis & Cory Bongle

In August 2020, the Midwest experienced a weather event called a derecho: a widespread, long-lived wind storm. This storm was a vexing issue for a Boldt construction project on the Leeward Renewable Energy's Lone Tree Wind Farm. We asked Boldt's Matt Berghuis, project executive, and Cory Bongle, regional safety director, to discuss the challenges.

PSJ: Can you give some background on the type of work being completed on this project and describe existing safety concerns?

Matt: Lone Tree was a new wind farm in Tiskilwa, IL, that consists of foundations, turbine erection, a collection system, a new substation and a transmission line to tie all the energy produced from the wind farm into the distribution. Some of the biggest safety issues that you deal with on a day-to-day basis on a project like this are public safety. Wind farms tend to be spread out, and the public roads are incorporated through permits into the project site proper so that we can, for instance, travel the public roads with our construction equipment. With how spread out and remote everything is, there are changes required in managing people as well. Some things you may take for granted on a smaller project—the ability to communicate, the ability to walk around and see everything that's happening—aren't always afforded in wind farms or heavy civil construction in general.

Cory: We had 32 towers (wind turbines) being built at this project site. They build wind farms where it's windy, right? So that is something you have to always take into consideration: the wind, the weather, whether it's raining, everyday changing conditions. There are some things that need extra control to make sure they're safe for all our workers and subcontractors, and anyone on the project site, even owners. As conditions change, we must look at that change management and how we are addressing any concerns throughout the day and throughout the project.

We had to address fall protection and high-angle rescue. We have employees tasked with different work, so their safety requirements are each a little bit different. There's a civil crew, grout crew, torque crew, cleaning crew, basement crew, to a top up. Everyone is trained on their task, especially when it comes to fall protection. And we have extra training on fall rescue. So, if someone is up tower, our employees are trained to help get those employees down so that if there is an incident or medical condition, we can have an outside resource ambulance or the local county come in and assist us.

On a site like this, there are ever-changing ground conditions. And there are multiple trucks that come and deliver equipment, offloading cranes, and then big cranes that set the base in the mid and then the top out. We deal with a lot of vehicle traffic and pedestrian traffic and make sure that interaction is safe between the two and everybody knows their role.

PSJ: You encountered an additional challenge: a long-lasting wind storm. How did this change your plans and work with the crews?

Matt: Our team had to consider several variables. There's the wind event itself: the team was tracking the weather event and had the foresight to realize that it may get out of hand quickly and got the cranes out of the sky and laid down. There's always the potential, especially in a straight-line wind event, that a crane tips over if you don't get the boom out of the sky. In the moment, the most important need is getting the cranes into a safe wind position to handle the extreme weather coming at them and monitoring it early enough so that you do not experience crane failure. And that's important in cranes and when walking (moving) the crane from site to site. So, we did not have a catastrophic crane failure due to tracking the weather and simply the diligence that is intrinsic to operating wind farm construction. When the derecho came through, it knocked out some power lines, which trapped one of our cranes.

It's important to understand that on all wind farms, you trend the wind. Generally speaking, in Illinois, the wind trends not so windy in the summer, and gets windier into the fall through the winter, and into the spring. The derecho started pushing our work later into the fall when, frankly, the wind was higher. If you trend those winds, you see the dips in the evening. Those are somewhat intrinsic to Illinois. If you get in a position where you're stuck in high wind during the day, you start preparing yourself to find lower wind windows and be ready to execute whenever those windows present themselves, which is the situation that we got into at Leeward.

Cory: Our organization is huge on safety culture. We're huge on psychological safety and really listening to everyone's safety concerns and making sure we're addressing or looking into them. Some of these crews that work on these wind farms have done it for a long time and have a lot of experience in doing that. So, making sure we listen, making sure we build that culture, that everyone has a voice to say, "Hey, I've done this on a different project." This has worked out well for us. Just understanding different situations.

NATIONAL WEATHER SERVICE

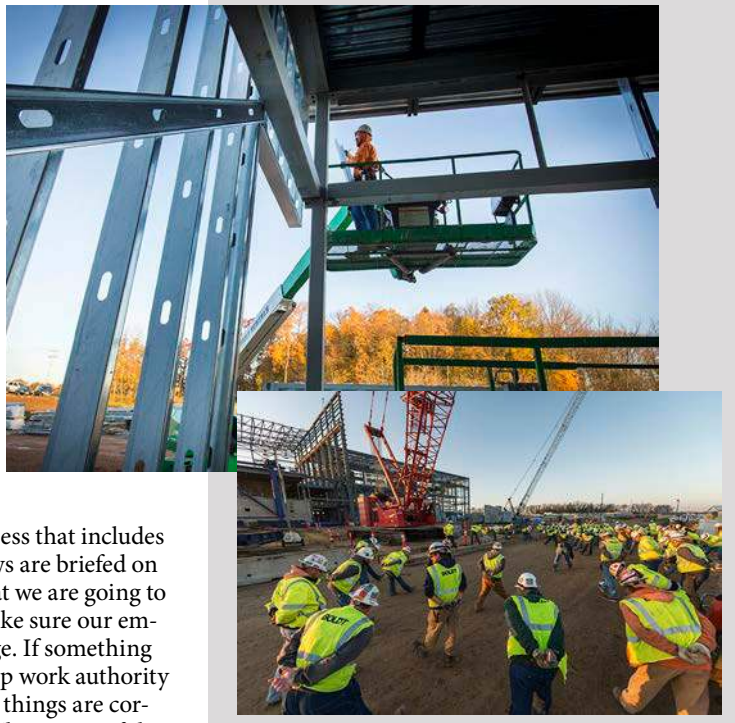
Matt Berghuis

Matt Berghuis is a project executive at Boldt, where he is responsible for establishing a productive culture founded on safety and quality to unify large project teams, ensuring alignment to meet project goals. He holds a B.S. in construction management from the University of Wisconsin, Stout. Berghuis is a member of the American Society of Mechanical Engineers, the American Water Works Association and the Arizona Society of Professional Estimators.

Cory Bongle

Cory Bongle is a regional safety director at Boldt. He has expertise in a variety of project settings from safety inspection checks, developing standard operating procedures, and conducting safety building inspections and trainings. He holds an A.A.S. in Occupational Health and Safety from Northeast Wisconsin Technical College.

"A well-thought-out plan resiliently executed is far better than the perfect plan partially executed."



Employees are at the core of Boldt's safety culture. Safety leadership personnel listen to workers' safety concerns and make sure those concerns are addressed. "Some of these crews that work on these wind farms have done it for a long time and have a lot of experience in doing that, says Boldt's Cory Bongle, regional safety director. "So, making sure we listen, making sure we build that culture, that everyone has a voice to say, 'Hey, I've done this on a different project.' When you involve the team in these processes, there's that buy-in. They will help you succeed in safety while making sure everything is done well."

And I think when you involve the team in these processes, there's that buy-in. They will help you succeed in safety while making sure everything is done well. That is one thing that we have learned—to open your ears and listen and work together as a team to ultimately get the job done and get it done safely.

We have those safety conversations and understand the plan for the day, making sure everyone involved talks about it. We have a process that includes a safety task analysis, where the crews are briefed on what hazards we have out there, what we are going to do to mitigate those hazards and make sure our employees are safe and on the same page. If something is not right, the crew utilizes that stop work authority to make sure we stop and make sure things are corrected and safe before we move on. This is one of the things that drove our plans to night work. Anybody can take the risk to say, "We have to get this done. We have timelines." But it takes a good crew, a good team to listen to say, "Hey, there has to be another way to accomplish this and to accomplish it safely."

PSJ: Once the team decided to work at night when the winds died down, how did your process accommodate the change?

Matt: You can isolate the variables in the moment. You have to be able to adjust in wind. It's very much like farming. When the weather is good, you plant, and when the weather is bad, you prepare to plant.

So, with all of that, you have to get the light plants set up. The other thing that needs to be thought through is moving the crane in an event. To do it safely, it must walk on a crane mat. There are a few steps, a walking procedure that must be done out front of it the day before. And you want to move the crane during the day so that it's ready at night.

You must have geotechnical done the day before so that you know what you're working with for your ground conditions the day of. You don't want that done months in advance. Ground conditions change based on moisture, so you're out front doing geotechnical probes. And then you have your team moving the crane as it walks across the cornfield. And to do that takes a team of people and equipment because you're constantly moving a platform that it walks on. It can't maneuver without a false floor built for it due to ground-bearing pressures. I think that's probably the single biggest event.

The other one that needs to be thought through is preparing for if an event happens. We're generally working in a very remote area, and sometimes, first responders are volunteer. Thinking through all that, making contact, and making sure you have a plan in place in case something goes awry on you. From that point on, it's making sure that you have good communication as you're maneuvering and make sure you're monitoring the weather, monitoring the wind. The worst thing that can happen whenever you're lifting is to be mid-lift and have weather come in on you, whether it's wind, lightning or other factors.

PSJ: How did you mitigate the risks of night work?

Cory: The risk of working at night is mitigated with adjustments for the crews. It all starts with culture and making sure each one of them acts as a sister's/brother's keeper to make sure they're well-rested, to make sure they watch over each other. And if they're not all in the game, the expectation is that they get out of the game. Our crews watch out for each other to make sure they're safe and they're not creating another hazard.

That works with culture. We talk about expectations. We talk about making sure that if you're not feeling right today, we'll just find a different task maybe that can fit you down on the ground level, so that we can still move the project forward, but maybe you're not climbing that tower. It's not as if one person is the only one that can climb the tower. There are multiple people trained in both climbing towers and in rescue as well. So, again, it's just a conversation.

We don't say, "Hey, today you're going to work. You're going to work the day shift and tonight you're going right to that night shift." There's a transition so that people can get their home lives settled to make sure they can sleep during the day. So, there is a transition that these folks are willing and able to adjust to get the work

done. I go to family, and I go to culture. These teams, they work with each other and put in more hours sometimes than being with their family, so they treat each other well and they watch out for one another.

Matt: Anytime you go to back shift, one of the biggest mistakes that a management staff can do is to come back and forth from front shift to back shift. You must make the decision that the crew is going to back shift and live with it because the transition takes days for your body to adapt. By the time you make that decision, you've thought about it, you've monitored and evaluated so many data points that it sort of just becomes the most logical, safest thing to do. But it's not like you sit there in a meeting one day and decide it's back shift time, and if you haven't been watching it, it's not going to be clear to you.

Cory: Another reason that we didn't want to go to back shift and then swap it was due to COVID-19. We were trying to limit how often crews interacted. Our goal was certainly social distancing, but because there are five in a tower crew, we intended to keep that core team together so that you could isolate them if there was an event.

It's hard to socially distance in a truck, crane or turbine, so we needed a large amount of vehicles on site to safely maneuver people. We basically teamed up our little crews and it was two people to a vehicle with a shield in the center. So, it drove our truck count really, really high, but that's fine. We had specific people to clean trucks and other precautions to make sure we could continue as well working through the pandemic.

PSJ: What advice do you have for how OSH leaders can work in constantly changing circumstances?

Matt: Over the course of my career, I've seen a lot of people come up with perfect plans that need perfection to come to fruition. I would suggest that a well-thought-out plan resiliently executed is far better than the perfect plan partially executed. I think it's important to focus on the basic blocking and tackling and know that you're going to have curve balls.

Cory: I also like to emphasize the importance of listening to some of the subject matter experts and getting the entire team, whether it's superintendent, foreman, operator, to create a plan and cover as much change as you can. They're the ones who are going to perform that work; they have buy-in. It speaks to the culture, and it speaks to that family to make sure we try to look at all the scenarios, come up with the best plan we can, and work on executing it. **PSJ**

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