

Every technician has something to learn

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A trainer's perspective on challenging established methods, understanding modern blade structures and giving technicians more ways to solve problems in the field. WTG Offshore supplies specialist trainers to its sister company, Global Blade Service USA.

One of the most rewarding parts of being a trainer in the wind industry is seeing where people start and where they finish.

Wind turbine blade repair is a hands-on trade. It requires technical knowledge, attention to detail, patience and, perhaps most importantly, the ability to keep learning. As a trainer, I work with people at very different points in their careers. Some arrive with no experience in composites or blade repair. Others have spent years in the field and have already developed their own ways of working.

I enjoy working with both.

There is something particularly satisfying about teaching someone who is completely new to the industry. At first, even the terminology, materials and processes can seem complicated. Concepts such as laminate orientation, resin ratios, surface preparation, vacuum consolidation and curing involve much more than learning a sequence of practical steps.

Then you see the moment when things start to click.

A technician who may never have worked with composite materials begins to understand why preparation matters, what a sound laminate should look like and how each stage of a repair can affect the finished result. They start asking better questions and noticing details that they might previously have overlooked.

Eventually, they aren't just following instructions. They understand why they are doing something in a particular way.

That's a big part of what good training should accomplish. Teaching someone how to perform a task in a classroom is only the starting point. Technicians also need enough understanding to make good decisions when the situation in the field doesn't look exactly like the example they were shown.

Experienced technicians bring a different challenge

Working with experienced technicians is just as rewarding, but in a different way.

Someone who walks into a training course with years of blade repair experience isn't

starting from zero. They already have practical knowledge, established habits and problem-solving skills developed in the field. They may have worked in difficult conditions, encountered unexpected damage and learned how to get the job done with the tools and resources available.

The challenge isn't to teach them everything again. It's to find the gaps.

Every technician has them.

Sometimes those gaps are technical. Sometimes they involve the theory behind a process the technician has performed hundreds of times. Someone may know how to carry out a particular repair but have had little opportunity to look closely at why the method works, what can cause it to fail or what to do when conditions change.

The gap might concern a repair technique, the behavior of a material or an aspect of inspection and quality control. Sometimes it's simply that nobody has shown the technician another way to approach the same problem.

Proper curing principles are a common gap in people's knowledge. Many technicians think that the goal is simply for the resin to become 'solid', without realizing that other important properties can only be achieved through the correct curing cycle.

That's where training becomes particularly useful.

An experienced technician might say, 'This is how I've always done it.'

My job isn't automatically to tell that person they're wrong. I'm more interested in asking, 'Do you know why you do it that way, and is there another tool or technique that could help?'

Those conversations can be some of the most useful parts of a course. They acknowledge what technicians have learned in the field while giving us the chance to question established methods.

One experienced technician I worked with had repaired smaller blades for many years. When working on larger blades, they marked the layup based on the layers found at the center of the defect and began the grindout

from the outside in. This resulted in massively oversized repairs because the complex nature of modern blade build plans was unfamiliar to them. Showing them how to work from the inside out changed their approach. The technician had the skills but needed a different method for the larger, more complex structure.

Adding to the technician's toolbox

Field experience is valuable. There are lessons learned from working on turbines that can't be fully replicated in a classroom. Technicians understand the realities of access, weather, time pressure and working within the physical constraints of a blade.

But experience can also create habits.

A technician can become very good at completing a particular job using the tools and methods they have always had available. That doesn't mean there isn't another technique that could give them more control or help them achieve a more consistent result.

I see my role less as replacing what technicians already know and more as adding tools to their toolbox.

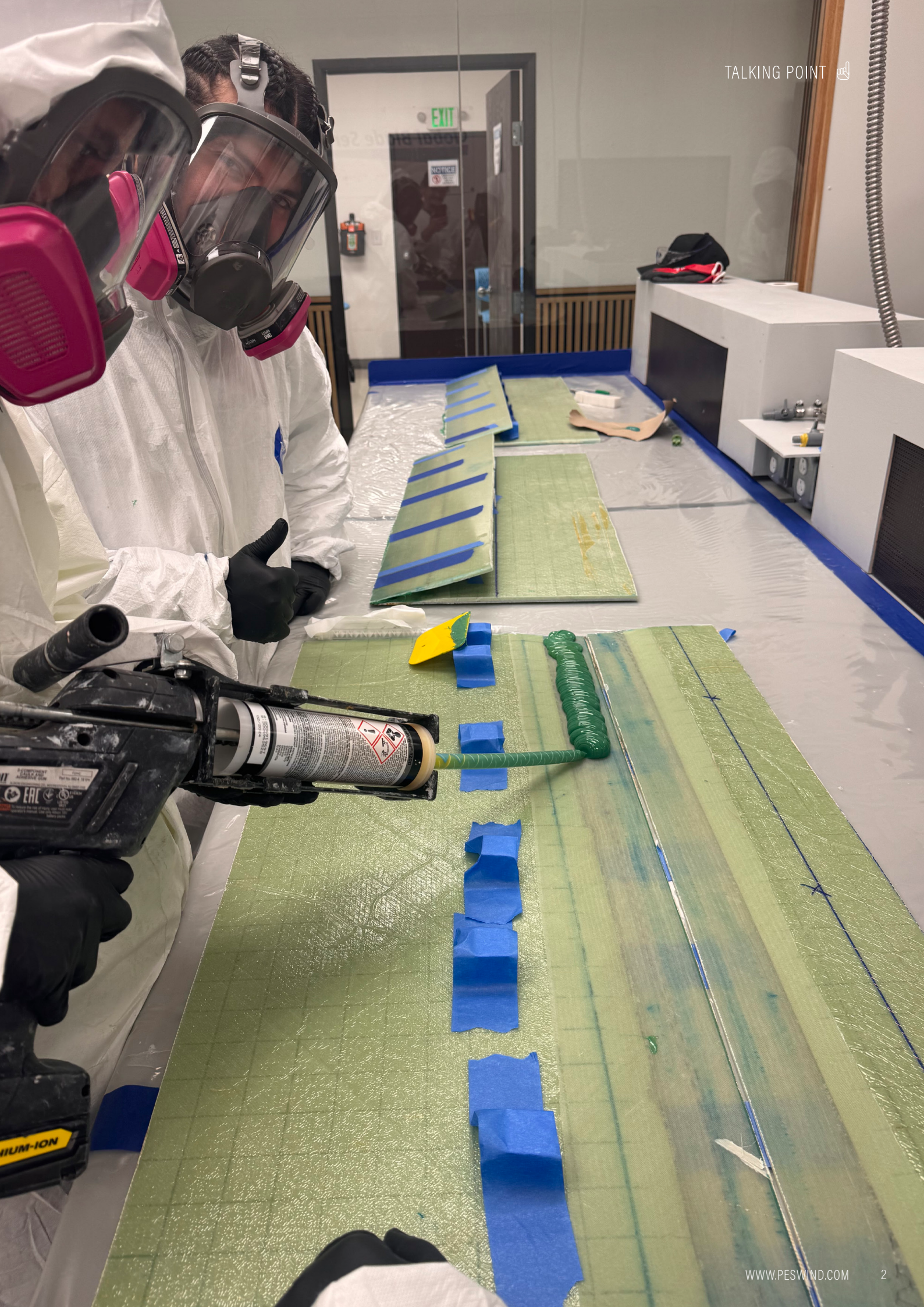
If an experienced technician leaves a course with two or three additional techniques they can use in the field, that's a successful training course. It might be a better approach to laminate preparation, closer control of resin application, an improvement in vacuum-bagging technique or a clearer understanding of why a particular defect occurred.

It may mean spotting a potential problem earlier. In composite repair, recognizing an issue before the next stage begins can be just as valuable as knowing how to correct it afterward.

Technicians should leave training with more options than they had when they arrived, particularly when the materials, damage or working conditions don't fit a familiar pattern.

Looking beyond the physical repair

One thing I try to emphasize in training is that a blade repair involves more than the physical work itself.





When we look at a damaged laminate, we aren't just asking, 'How do we fix this?'

- What caused the damage?
- How far does it extend?
- What is the condition of the surrounding laminate?
- Has the structure been compromised?
- What preparation is required?
- How will the repair be consolidated?
- What could go wrong during the repair?
- How do we know the finished repair is good?

These questions help technicians look at the whole repair instead of treating it as a list of separate tasks.

Surface preparation affects the bond with the existing structure. Laminate orientation is important when rebuilding the intended structural arrangement. Resin application, consolidation and curing all influence the finished laminate.

It's possible to follow the individual steps of a procedure and still miss something important. A technician needs to understand how the stages connect and recognize when the repair isn't developing as expected.

Modern blades make this particularly important because it is increasingly easy to become confused by the number of layers visible when grinding a repair. A line might indicate a new layer or simply a join between

two pieces that make up one layer. With so many layers and individual pieces in a new blade, it is easy to lose track.

A key warning sign is reaching the point where you can no longer tell exactly which layer you are looking at. That is the time to take a step back, count the layers and work out which piece you are seeing, rather than continuing to grind and potentially going too deep.

That way of thinking matters at every level.

A new technician needs to learn how to assess the repair rather than simply follow a procedure. An experienced technician may already do much of this instinctively, but training gives us an opportunity to examine that thinking and consider other ways of approaching the same problem.

It also helps create consistency. Blade repairs are carried out by different technicians, often in changing conditions and across multiple sites. A shared understanding of preparation, process control and the expected result means the quality of a repair is less dependent on one person's habits.

Many factors must be documented throughout a repair to provide confidence in its quality. Pictures help tell the story and can show surface preparation and the visible quality of the laminate, but a considerable amount of data must also be collected.

Environmental conditions such as temperature and humidity are vital. Cure data must be recorded to show that the specified cure cycle was followed, and samples can be taken for later testing. Each step in the

process must be followed, verified and reported to ensure that we have done our part, both as technicians and as a company.

As a quality assurance officer who works remotely, I always tell technicians that it doesn't matter how good the repair is; it's only as good as the pictures and data. Without good documentation, it's meaningless.

Training works both ways

One of the things I appreciate most about being a trainer is that the learning doesn't go in only one direction.

Experienced technicians bring real-world knowledge into the training room. They have encountered problems that may never appear in a training manual and worked in conditions that are difficult to reproduce during a course. Their questions come from situations they have actually faced.

Those questions can be extremely valuable.

They sometimes make me rethink how I explain a process. They can lead to discussions about the advantages and limitations of different repair methods or highlight an area where a procedure or piece of training material needs to be clearer.

A good training environment should be a two-way conversation. I'm there to pass on knowledge, but I'm also learning from the people in front of me.

Training needs that connection with field experience. Without it, a course can become too theoretical. At the same time, experience needs to be questioned occasionally. Otherwise, outdated or inconsistent practices can become accepted simply because something has always been done in a particular way.

Always something more to learn

Materials change, repair systems develop and equipment improves. Our understanding of composite structures also continues to grow. The work expected of technicians changes with it, particularly as blades become larger and repairs have to be completed reliably in challenging environments.

None of us reaches a point where there is nothing left to learn.

For a new technician, training provides the foundation on which practical experience can be built. For someone with years in the field, it offers a chance to step back from day-to-day work, look again at what they know and add a few more tools.

The best result isn't a technician who can simply repeat the repair demonstrated in class. It's someone who leaves thinking, 'I understand this better now, and I have more ways to solve the problem when I get back into the field.'

That's what we're trying to develop: technicians who can do the work, understand why they're doing it, question their own methods and continue improving throughout their careers.

As a trainer, there isn't much more satisfying than watching that happen.

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