



# Supporting Cost-Effective Wind Farm Sustainability

## Challenge

A wind farm project in Alberta, Canada, suffered setbacks after numerous turbines became inoperable over the course of several months, resulting in a loss of revenue and an inability to produce and distribute energy. The outage was affecting all supply chain entities, including the contractor’s employees and customers.

It was determined that the power outage was the result of cable splicing failures which often occur after installation.

To troubleshoot the issue, Wesco’s Technology & Support Services (TSS) experts were called to investigate the damage. A preliminary assessment determined that poor workmanship and cable material caused the power failure.



## Summary

### Customer

Contractors working on a wind farm construction project in Alberta, Canada

### Challenge

Cable failures led to inoperable wind turbines, project delays and revenue loss

### Solution

Diagnosed the root problem of the wind turbines and replaced the entire cable length with a new installation

### Results

The customer received the appropriate cable selection, which put the project back on track saving them time and money and getting them closer to their revenue goals



### Solution

Wesco's TSS team conducted a root cause failure analysis to examine the conductor of the wind turbines and diagnose the problem, including observing the cable preparation for splice, as well as dissecting one of the splices to look at the components in detail.

An essential component of wind turbine cable is the current carrier's conductor. Even though the conductor is the most necessary part of any cable, cable system accessories are often the most prone to failure.

Therefore, Wesco's team recommended sending the splice sample to the test lab to find out what was causing the cable jacket failure. The lab confirmed that throughout the entire cable length there was black mastic, a water-blocking material, between the phase conductor that caused extreme heat due to the issue of metal-to-metal connectivity.

Very little can go wrong with a properly designed conductor, but various factors require consideration when choosing the correct cable. In this case, it was clear that the cable selection was inaccurate, especially for the extreme cold weather in Canada.

After the investigation, Wesco's suggested solution was to replace the entire cable length with a new installation instead of continuing to splice the existing cables. This innovative solution helped the contractor make an informed decision about the most cost-efficient way to increase their project's longevity.

### Results

Working with Wesco gave the customer access to a top industry supplier network that helped ensure:

- Reliable operations and reduced likelihood of the customer encountering the same issue
- Increased cable life by choosing the correct cable for the job in cold climates
- Reduced operational costs by supplying a cable designed to lower electrical stresses
- Elimination of pressure loss during the heat cycling by using the newest technology
- Longer-lasting performance by mitigating cable preparation errors and improving workmanship in splice installation

Wesco's technical team helped the customer resolve the issues for this 147 megawatts power generating system while reducing total installation costs by 20%.