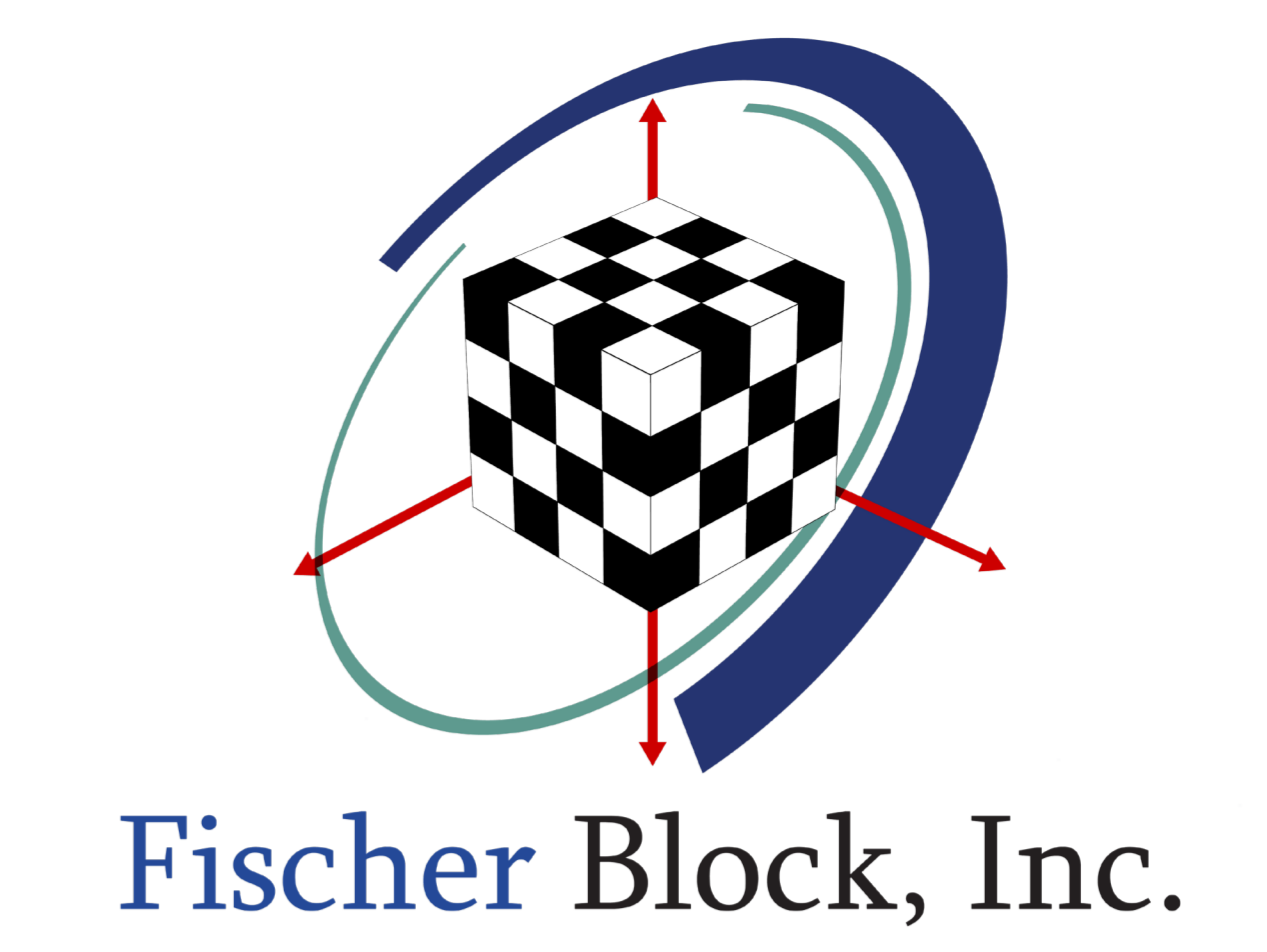


TURNING BIG DATA INTO BIG SAVINGS:


How IoT and Predictive Analytics are Preventing Costly Failures



Greg Wolfe, IEEE, Six Sigma Black belt, President & CEO Fischer Block, Inc.

BACKGROUND/PROBLEM:

- Traditional vibration monitoring systems miss critical electrical problems.
- Costly failures go undetected until it is too late.
- Excessive O&M Costs could be avoided with better technologies

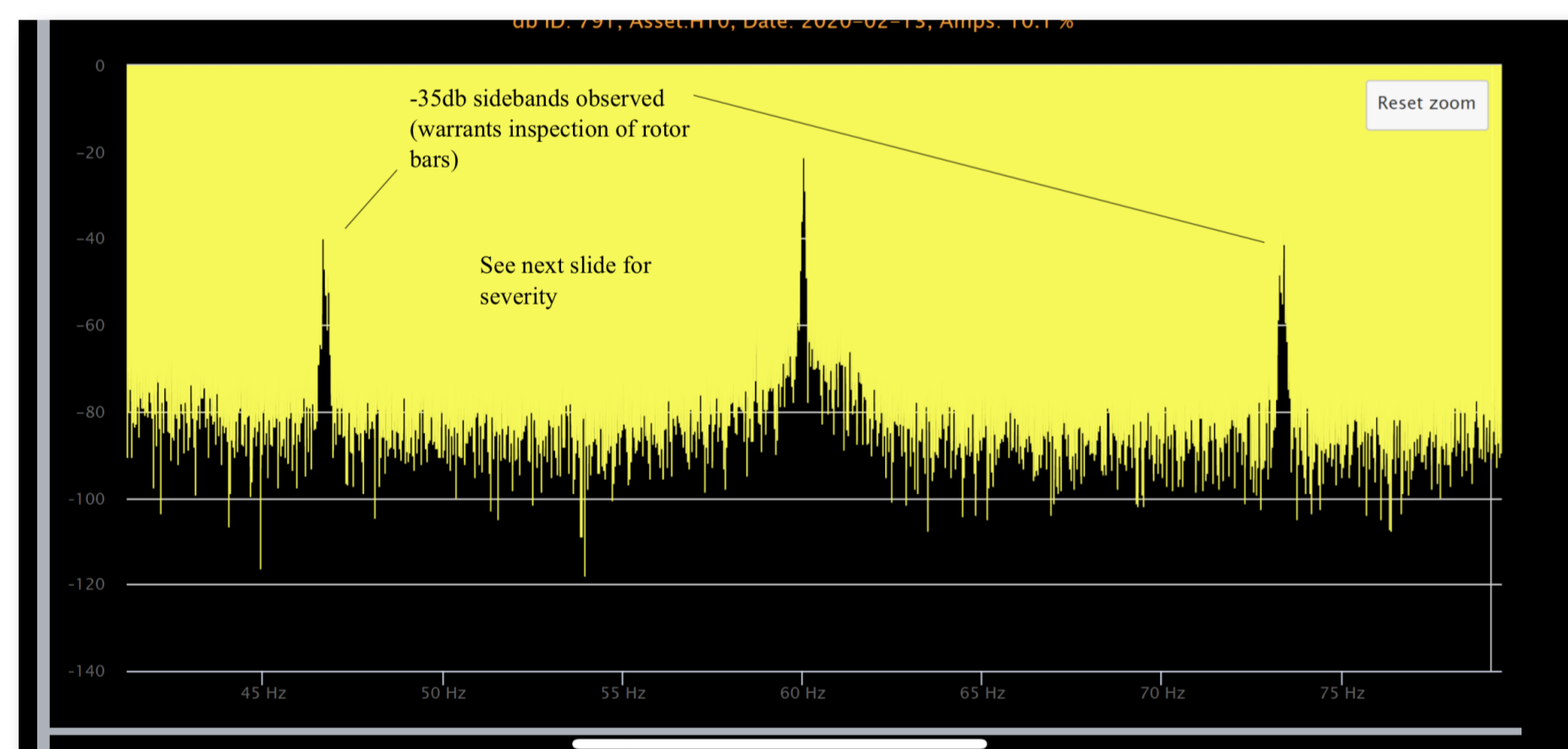


New Monitoring Technique

Significantly Improves Availability

METHOD:

Generator output signal contains critical information for both mechanical and electrical system problems.



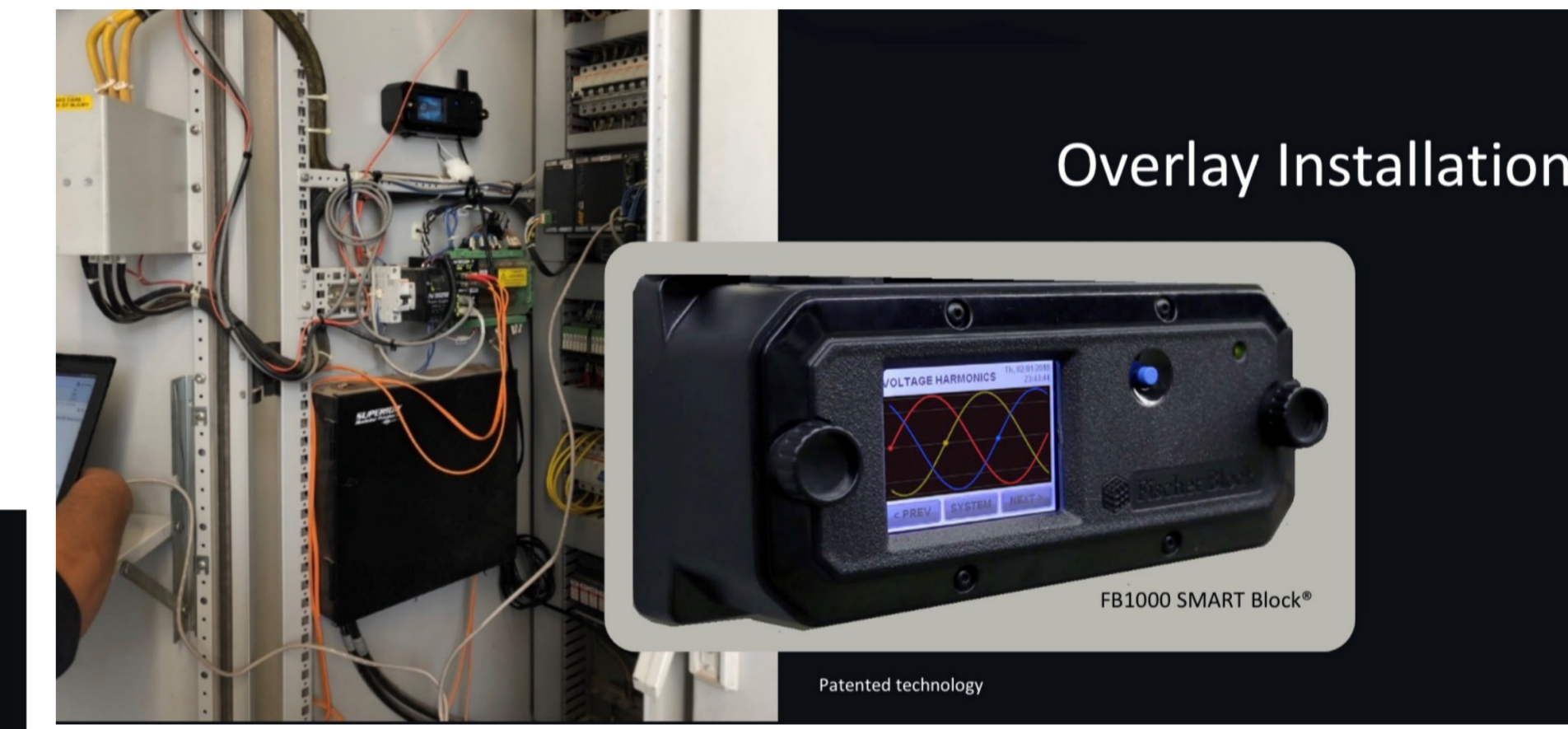
- High resolution monitoring of generator output signal can detect early indications of system failure.
- Alert notifications provide actionable insight to avoid costly failures.

IMPLEMENTATION APPROACH:

Edge sensor device installs one-per-turbine, non-intrusive; requiring no outage.


Leveraging existing communication infrastructure, edge sensors communicate with server-based analytics platform.

Dashboard can reside in the cloud or on-premise behind your firewall.



RESULTS:

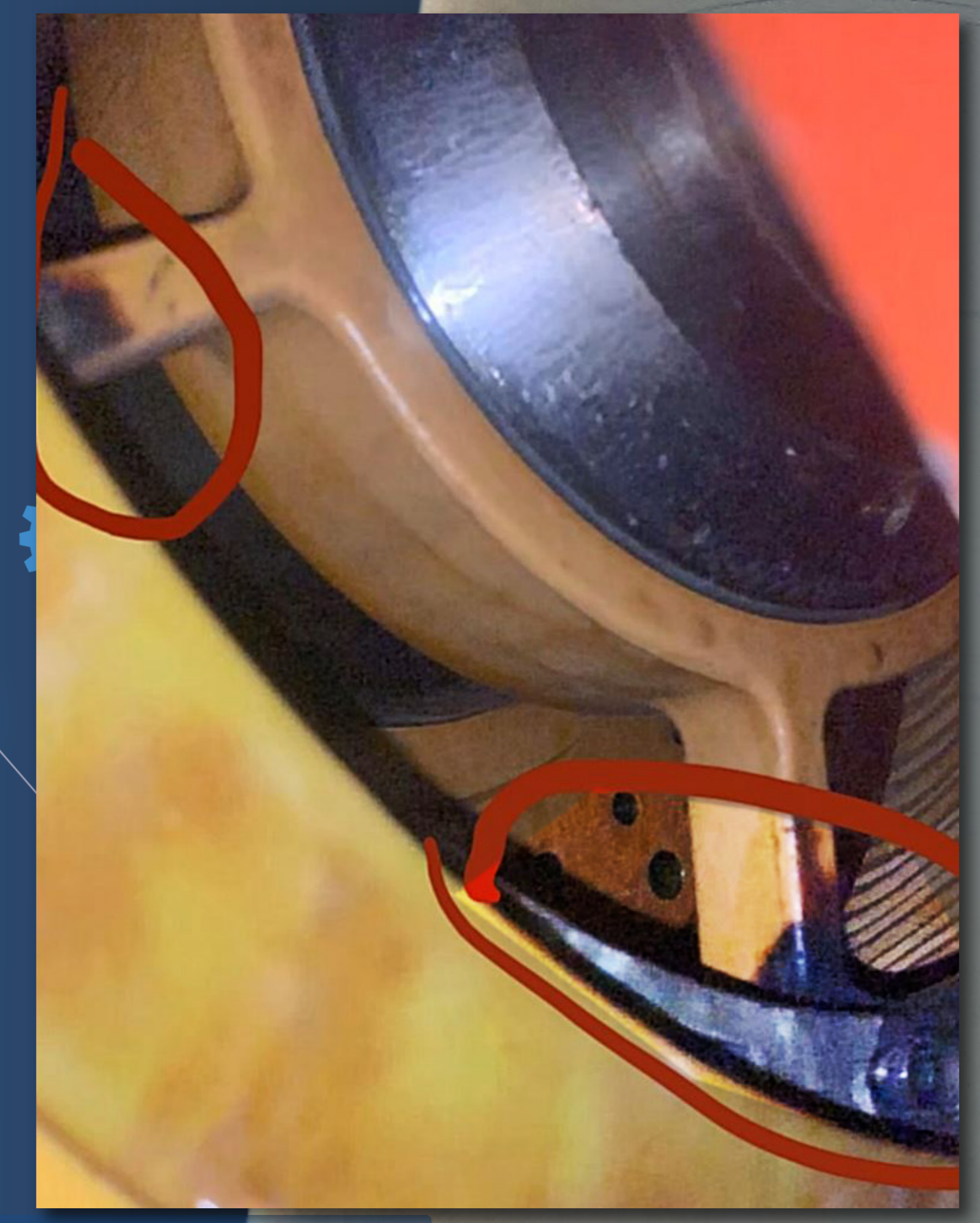
- Wye-ring fatigue detected well before costly failure.
- Alert notification was sent to maintenance team for visual inspection.
- Hot spot deformation confirmed at wye-ring joint.
- This wind farm operator is now able to pro-actively coordinate the repair with other turbine repairs, or postpone until off-season.



RELATED WORK:

This can be used as a stand-alone technology.

Underground faults at wind farms can be detected and isolated with this technology. Current work is being documented and will be presented at future conferences.



DETECTED DEFECT TYPES	
→	Shaft misalignment
→	Winding issues
→	Wye ring fatigue
→	Generator imbalance
→	Gear problems
→	Outer/inner race bearing
→	Harmonics
→	Blade imbalance
	<i>partial listing</i>