## LOAD NONITORING NONITORING STENER

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## **Transmission Dynamics**

Copper State

> "The Future of Critical Bolting"

ORE Catapult's 7MW Levenmouth Demonstration Turbine (Credit: ORE Catapult)



• 75MW Wind Turbine, Levenmouth (UK)

MF.

Vaso

- 7 X instrumented M72 bolts installed on the wind turbine tower
- Measuring bolt tension and temperature since 2019
- Login now to check bolt tension live at https://gdn.jrdltd.co.uk/ Username: orec Password: QJ5ANv4Xjg

"Our Levenmouth Demonstration Turbine allowed this technology to demonstrate how it sends instant alerts if bolt preload drops below a predefined level, allowing operations and maintenance teams to act instantly to re-tighten the bolt and address any underlying issues." - Chris Brown Asset Manager, ORE Catapult

## Tension Trend

	1750	
	1500	
	1250	
2	1000	
sion 000	750	
Tent	500	Sanday, Jul 21, 06:00:05 = Series 1 - 28
	250	
	0	
	-250	9 Aug 10 Sep 19 Oct 19 Nov 19 Dec 10 Jan 20 Feb 20 Mar 20 Apr 20 May 20

c.1500 kN when bolts were installed, followed by light relaxation and subsequent re-torquing.

Wind Turbine Application: Foundations, Towers, and Blades

- Operations and maintenance costs account for >30% of Levelized Cost of Energy
- Up to 90% of expenditure results from manual inspections
- LMF<sup>+</sup> provides continuous monitoring, reducing manual checks and associated costs