R3-MYDAS

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ADVANCED TECHNOLOGIES FOR BATTERY LIFECYCLE MANAGEMENT

Identifying and Overcoming Skills Gaps within the R3-Mydas Industrial Remanufacturing Use Cases

As the manufacturing sector transitions toward greener and more digital practices, including adopting circular approaches such as remanufacturing, it is crucial to equip the workforce with the skills needed to implement and lead these changes. EIT Manufacturing is addressing this challenge by leading training and upskilling efforts in R3-Mydas, with the first phase, a detailed analysis of skills gaps among partners involved in remanufacturing pilots, which are now completed, with the findings outlined below.

Partners involved in the oil and gas remanufacturing use case reported key skills and knowledge gaps relevant to the advancement of automated laser-cladding workflows. These include understanding material properties (e.g., hardness, toughness, wear resistance), the impact of environmental factors (temperature, humidity, air quality) on material behavior, and proficiency in welding techniques.

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Market & Technology Insights from R3-Mydas: Remanufacturing Shaping Europe's Future

Europe's manufacturing landscape is transforming rapidly, driven by sustainability ambitions, circular economy initiatives, and advanced technologies. At the forefront of this evolution is the R3-Mydas project, which recently assessed market dynamics and technology trends shaping remanufacturing practices in three pivotal sectors: Oil & Gas, Electric Vehicles (EVs), and Wind Energy, alongside an innovative digital marketplace.

In the Oil & Gas sector, remanufacturing of crankshafts is experiencing a notable shift from traditional welding and thermal spraying methods to advanced laser cladding. This trend is driven by the industry's need for solutions that minimise downtime, extend component life, and cut maintenance costs.

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FLENDER reaches milestone in development project in R3-Mydas to reuse and upgrade technologies for high torque density journal bearing gearboxes

Flender, as part of the R3-MYDAS project, is developing flange connection repair, reuse, remanufacture and upgrade options. Flender has over 40 years of experience in developing wind turbine drivetrain solutions and technology, upon which the R3-Mydas project dynamic tester is built. One project goal is to examine the potential of new “remanufacture” service processes and methodologies, providing cost and environmental benefits to the industry. This can also include options forrepair and reuse of the component.

Since the start of the project, Flender has successfully implemented an upgrade option to bolted flange connections that are susceptible to fretting wear. This wear usually accumulates due to small movement between the bolted surfaces in operation

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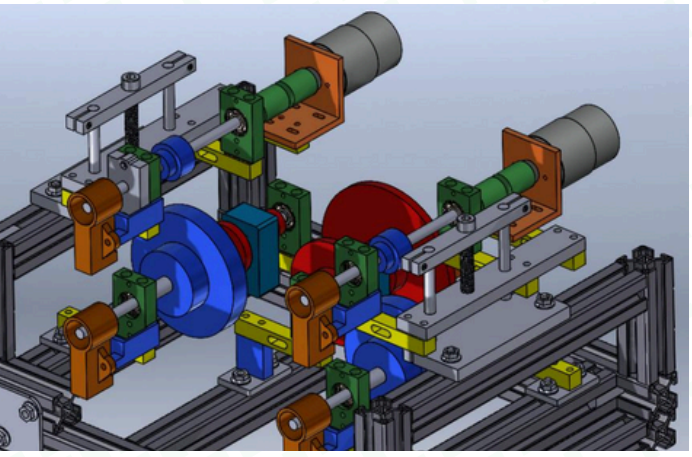
Getting to the root of wind turbine failure by Multiphysics simulation

Wind turbines are vital for renewable energy, but face significant maintenance challenges that drive up costs. Premature failures in key components like pitch and main bearings, gearboxes, and generators are some of the most common issues. Mechanical stress, rapid acceleration, deceleration of gearbox shafts, and torque reversals can lead to high-impact loads that disrupt lubrication and alter bearing kinematics, resulting in increased wear from friction.



Another serious concern is electric discharges, especially in the gearboxes of wind turbines. These discharges can lead to the formation of white etching cracks (WECs) in rolling element bearings. This damage, which results from stray currents and certain lubricant conditions, causes localised wear and structural changes in the bearings, ultimately leading to premature failure.

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Partners

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