Newsletter 4

R3-Mydas to exploit gearbox flange connections by state-of-the-art testing and remanufacturing technologies for high torque density journal bearing gearboxes

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State-of-the-art testing and remanufacturing technologies for high torque density journal bearing gearboxes

Flender as part of the R3MYDAS project is developing and building a flange connection tester for the wind drivetrain application. Flender has over 40 years of experience in developing wind turbine drivetrain solutions and technology. As already presented in newsletter 2 about wind turbine journal bearings, it continues the R3MYDAS project theme of dynamic testing to represent demanding conditions of wind turbine gearboxes. One goal of the project is also to examine the potential of new "remanufacture" service processes and methodologies – providing cost and environmental benefits to the industry.

Flange connection tester is design to reliably produce test parts with fretting corrosion, which is caused by micromovement between bolted support structures. Currently, design of the tester is proceeding to final version and procurement of assembly components has started. Tester will be a state-of-the-art configuration not available anywhere else on the market. It will allow testing of variable initial parameters, such as simulating changing loads, planet configurations, friction coefficients etc. Purpose of the testing is to isolate parameters causing fretting in flange connection and seek methods to improve reliability by prevention, redesign or remanufacturing. It is currently planned that commissioning will start in Q1/2025 and initial tests would be performed during Q2/2025. Moreover, investigation into remanufacturing possibilities of flange connection after fretting damage is ongoing.

After testing the damaged components will undergo a "remanufacture" process with state-of-the-art technology. The methodology will be evaluated and cost efficiency of the process determined. Remanufactured components will also go through testing to measure the effectiveness of the remanufacturing process.

Figure 1. Example of fretting damage in bolted connection after part disassembly from field