

Ultrasonic Monitoring of Barnesmore Field Wind Turbine Gearbox Bearing

INTRODUCTION

20% of wind turbine downtime is caused by gearbox malfunction which are mostly caused by bearing failures [1]. Advanced condition monitoring through ultrasound can improve reliability and lower cost of energy resulting from downtime. Results were obtained from both lab and field testing.

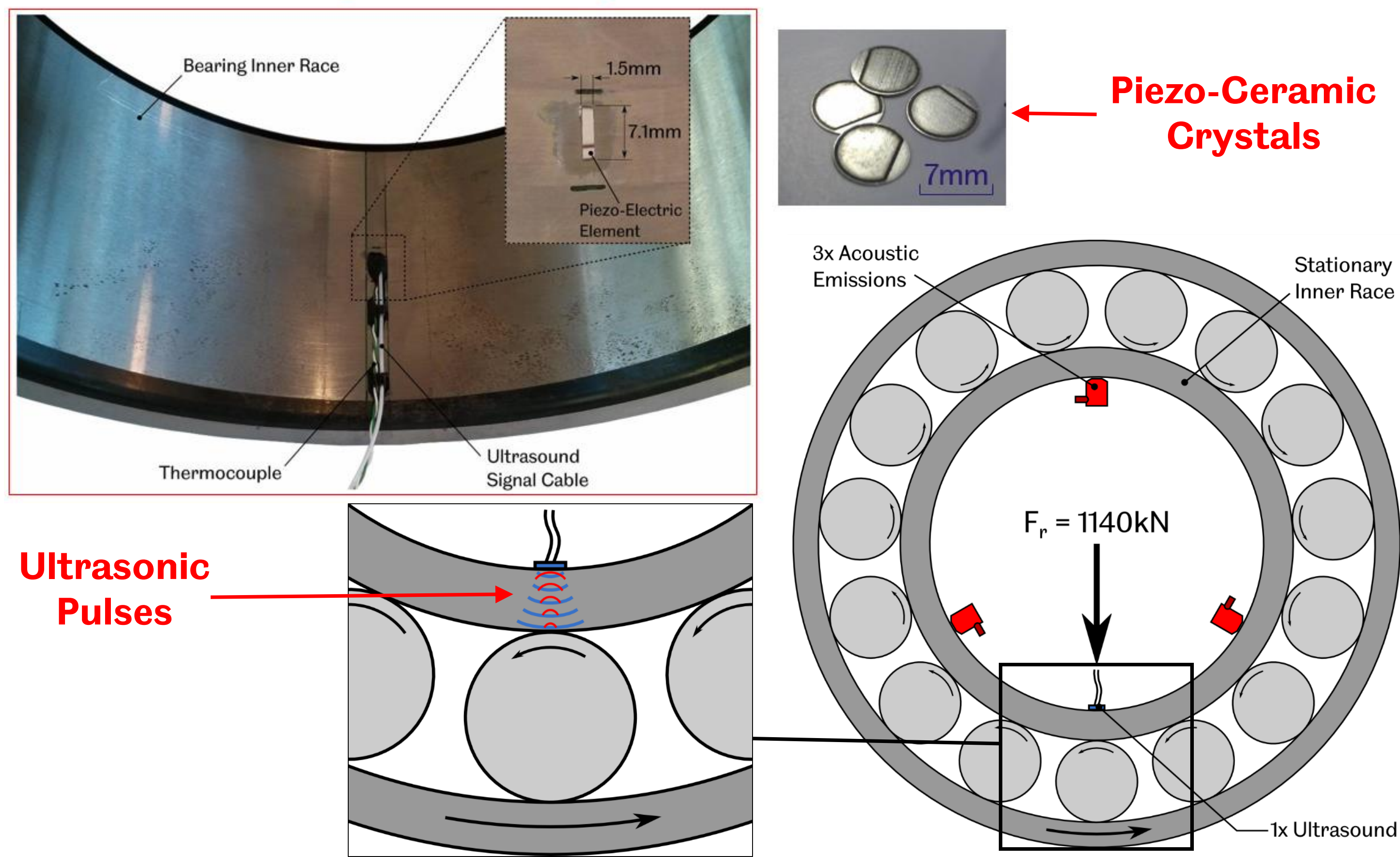
BENEFITS

- Detect onset of failure
- Bearing surface & lubrication condition
- Bearing load & lubricant film measurements

BEARING TEST RIG INSTRUMENTATION

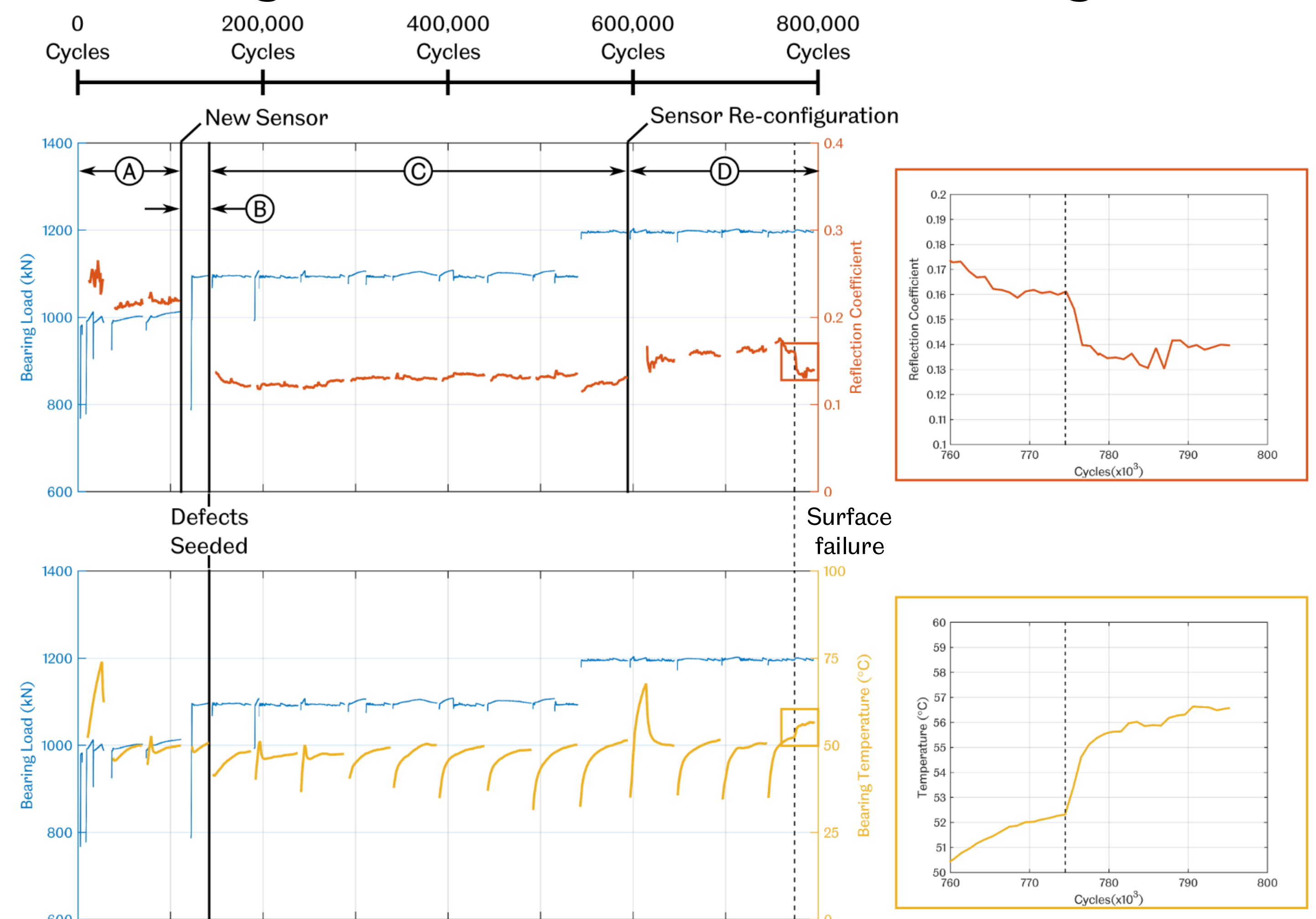
- Testing on PSL NU2244 Cylindrical Roller Bearing
- Ultrasonic sensors & thermocouple utilized
- Accelerated life testing

Test Bearing Inner Raceway

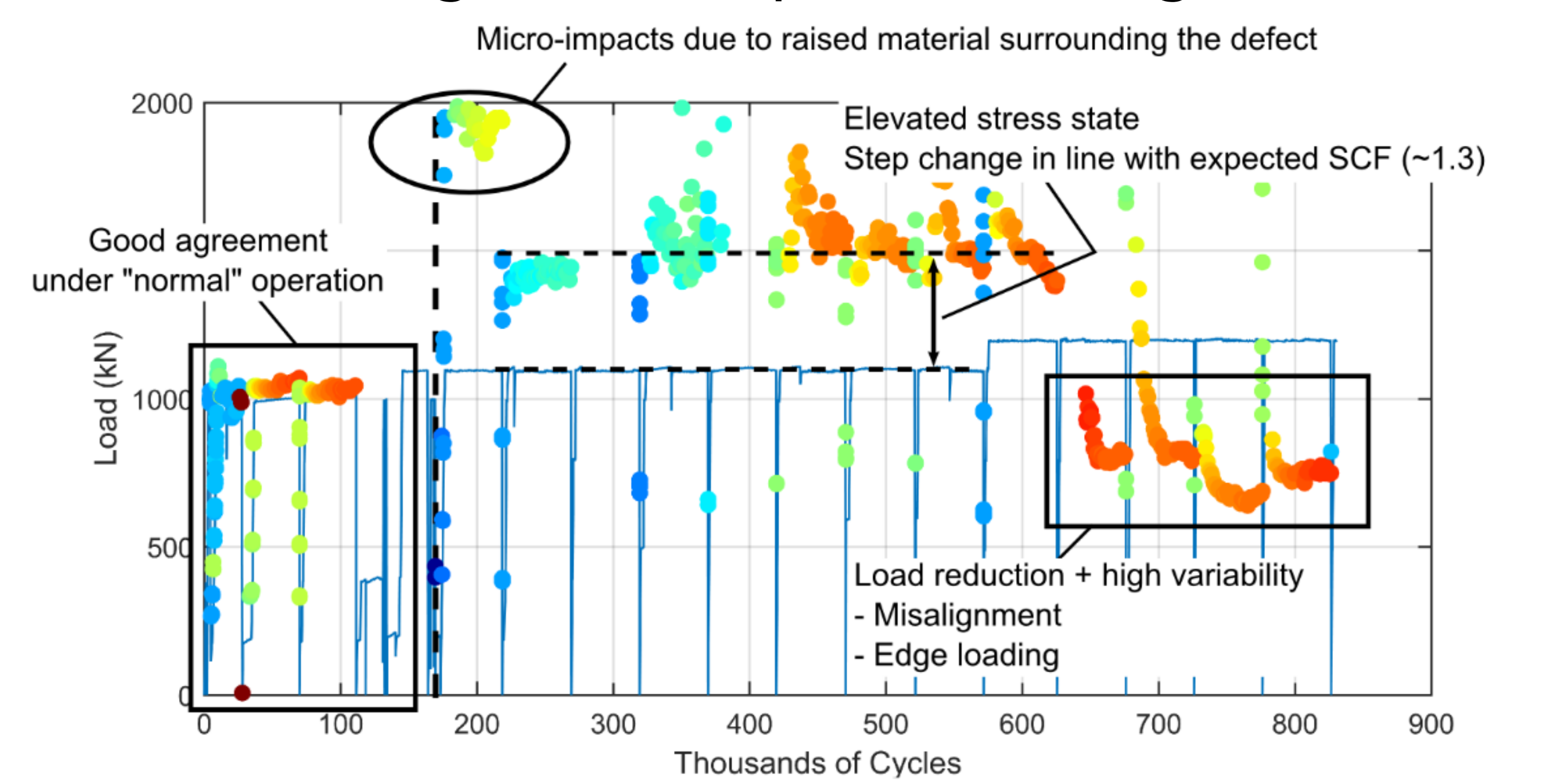


RESULTS

- Bearing lubrication condition from test rig data

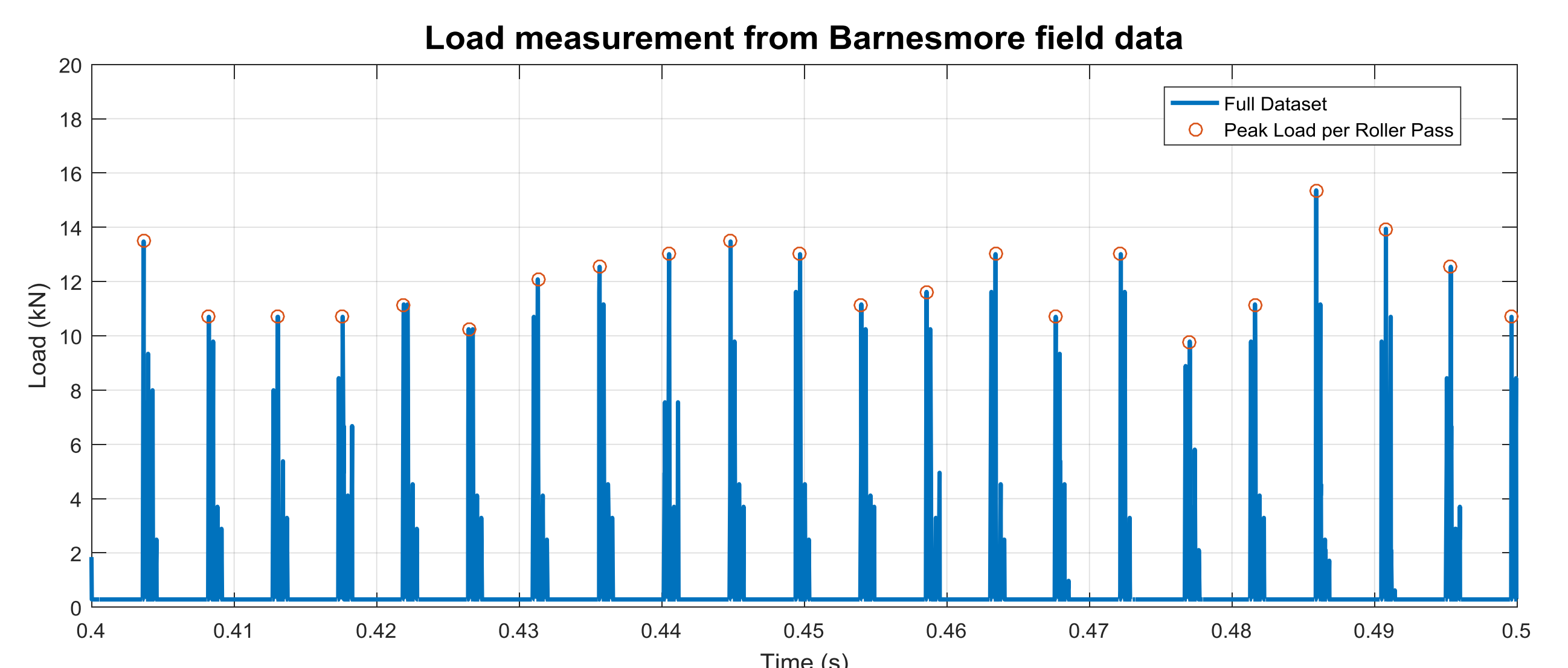
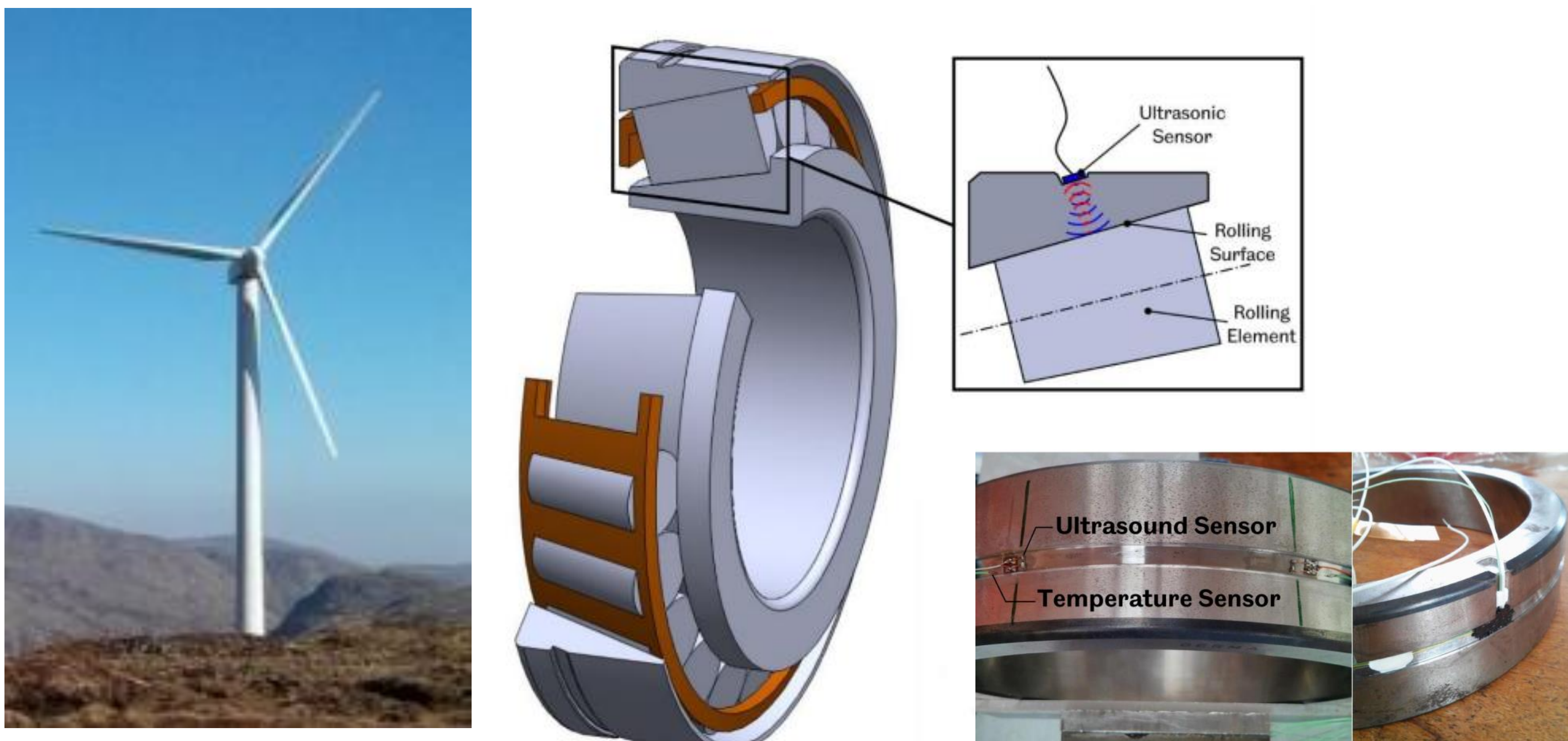


- Contact load measurements from rig & field data
- Field data agree with expected bearing load



BARNESMORE WT BEARING INSTRUMENTATION

- Within a Vestas V42 600kW Wind Turbine
- Testing on a SKF 32222 Tapered Roller Bearing Inner Race



[1] S. Jain and H. Hunt, "A dynamic model to predict the occurrence of skidding in wind turbine gearbox bearings," in Journal of Physics: Conference Series 305, Cambridge, 2011. Gary Nicholas (gNicholas1@sheffield.ac.uk), Dr. Tom Howard (tomhoward417@gmail.com), Dr. Matt Marshall (m.b.marshall@sheffield.ac.uk), Prof. Rob Dwyer-Joyce (r.dwyerjoyce@sheffield.ac.uk)