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## **Ricardo led consortium wins funding for advanced wind energy bearing technology**

**Project aims to develop Ricardo bearing technology to extend service life by up to 500 percent – will benefit from share of £3 million in funding to be provided by the Northern Wind Innovation Programme (NWIP) intended to stimulate innovation and technological developments for the offshore wind industry in the North of England**

Turbine gearbox bearing durability is a key issue for wind energy providers, in particular for off-shore farms where in-service maintenance is both expensive and challenging. Bearings are subject to a wide range of different operating conditions and installation constraints, resulting in a diversity of failure modes that continue to challenge the wind industry. Forensic investigation undertaken by Ricardo on behalf of clients has unearthed classic faults categories: some are due to unequal load distribution applied to the bearings in epicyclic gears, while others arise after running at partial turbine power when the rolling elements are prone to skid rather than roll and cause scuffing of the precision ground surfaces. Irrespective of the cause, wear on the inner bearing ring is concentrated over a small arc of some 40 degrees and can lead to premature failure, whilst the remainder of the ring remains unworn. One pragmatic solution involves rotating the “fixed” inner race every-so-often such that the wear is distributed around the full circumference of the race. This ensures that the fatigue damage or wear never reaches a critical condition during the turbine life – an approach also applicable to the outer races of direct drive turbines subject to sustained gravity loads.

The new consortium project will be led by Ricardo and involves The University of Sheffield and an industrial bearing manufacturer. A suite of automated mechanisms to index the bearing races was devised and patented by Ricardo before presentation at the 2009 Offshore Wind Conference in Stockholm. Through their respective contributions to the project, the Leonardo Centre Sheffield



# NEWS RELEASE

University will apply its analysis and oil-film measurement techniques, while the industrial bearing manufacturer will provide volume manufacturing expertise for large bearings and prototype parts. When fully developed, the new Ricardo bearing technology is aimed at providing a five-fold increase in bearing life in comparison with existing bearing technology.

Commenting on the funding award, Ricardo CEO Dave Shemmans said:

“The award of funding for this key project demonstrates the manner in which Ricardo is able to successfully develop technology and innovations aimed at meeting some of the most pressing needs of the renewable energy industry. Improved reliability and reduced warranty issues are crucial targets for wind power operators as they seek to deploy higher capacity systems in off-shore locations.”

The Northern Wind Innovation Programme is a Collaborative Research and Development product as part of Solutions for Business, the Government's package of publicly funded business support designed to help companies start and grow. From almost thirty applications received, ten consortia – including the successful Ricardo project – were selected against strict technical and economic criteria.

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## NOTES TO EDITORS:

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