Success Story

Industry: Wind Energy

Application: Micro Wind Turbine

Cost Savings: 337,600 euros

Introduction

A micro wind turbine project was in danger of being shut down due to the prohibitive costs of the bearings being used. For the project to continue, purchasing and manufacturing costs needed to be reduced. NSK engineers identified several areas in the machine design which required modification, to ensure the optimum and most cost effective bearing arrangement was used. By reviewing the complete unit build, a saving of €337.600 was made.

Key Facts

- Micro wind turbine
- Project in danger of being shut down due to prohibitive cost of bearings
- NSK Solution: Application design change in several areas significantly reduced the unit build cost
- Improved performance, reliability, simplified assembly procedures and longer bearing life from 200.000 hours to 224.400 hours

↑ Micro Wind Turbine

Value Proposals

- An Application review of the machine design identified several areas to significantly reduce the unit build cost. This included replacing one single row angular contact ball bearing combined with a single row radial ball bearing on the main shaft, charged with regular grease - with two single row radial ball bearings, charged with long life grease. Single row ball bearings have the advantage of being able to support axial loads as well as radial.
- NSK's recommendations also offered improved performance, reliability, simplified assembly procedures and longer bearing life from 200,000 hrs to 224,400 hrs. A supporting design justification report, bearing and grease life calculations were also produced.

Product Features

- Steel cage
- High load ratings (7% to 19% increase in dynamic load rating)
- Optimised internal design
- Bigger rolling elements
- Some sizes available with closures (shields, seals)
- Longer life (22% to 68% increase in ISO L10 life)
- Interchangeable with the standard Deep Groove Ball Bearings
- Possibilities of downsizing

↑ Deep Groove Ball Bearing with Long Life Grease

Cost Saving Breakdown

Before		Cost p.a.	NSK Solution	Cost p.a.
	Main Shaft - Original bearing arrangement annual production requirement	€ 386.800	Main Shaft - Improved bearing Arrangement using a simplified design, annual production requirement	€ 60.200
	Yaw Shaft - Original bearing Arrangement annual production requirement	€ 74.000	Yaw Shaft - Improved bearing Arrangement using a simplified design, annual production requirement	€ 63.000
Total Costs		**€ 460.800**		**€ 123.200**