Success Story

Industry: Wind Energy

Application: Micro Wind Turbine

Cost Savings: $361,616

Introduction

A micro wind turbine project was in jeopardy of being shut down due to the prohibitive costs of the bearings designed for use. For the project to continue, purchasing and manufacturing costs needed to be significantly 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 savings $361,616 was realized.

Key Facts

- Micro wind turbine
- Project in jeopardy of being shut down due to prohibitive bearing cost
- NSK Solution: Application design change in several areas significantly reducing the units build cost
- Improved performance, reliability, simplified assembly procedures and bearing life increased from 200,000 hours to 224,400 hours

↑ Micro Wind Turbine

Value Proposals

- After an application review of the machine design the suggestion was made to replace the 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)
- Optimized 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
- Downsizing possibilities

↑ Deep Groove Ball Bearing with Long Life Grease

Cost Saving Breakdown

Before	Cost p.a.	NSK Solution	Cost p.a.
Annual bearing production requirment for Main Shaft - Original bearing arrangement	$414,319	Annual produciton requirment for Main Shaft - Improved bearing Arrangement	$64,483
Annual production requirement- Yaw Shaft - Original bearing arrangement	$79,264	Annual production requirement- Yaw Shaft - Improved bearing arrangement	$67,484
Total Costs	**$493,583**		**$131,967**