Success Story
Industry: Steel and Metals
Application: Gas Turbine Blade Casting
Cost Savings: 100,095 euros

Introduction
A company was experiencing a short service lifetime from the bearings used in the casting of gas turbine blades. NSK undertook an Application Review of the existing design which included an inspection of the failed bearings. An extremely caustic solution combined with high loads and misalignment was causing lubrication and seizure problems. An alternative wheel design was proposed using a cylindrical roller bearing, with improvements in sealing and lubrication. This resulted in significantly improved performance and doubled lifetime.

Key Facts
- Gas Turbine casting
- Bearing replacement every 6 weeks
- Caustic solution: 50% Sodium hydroxide at 180°C
- NSK solution: Application design change of wheel used on carousel, with bearing substitution to NSK sealed cylindrical roller bearing
- Reduced downtime and maintenance
- Doubled bearing life
- Significant reduction in bearing and maintenance costs

Value Proposals
- The customer was experiencing poor performance on bearings within a carousel application. A Failed Bearing Analysis performed by NSK Engineers showed that this was caused by ingress of extremely aggressive caustic solution, combined with high loads and misalignment
- An Application Review highlighted inadequate sealing as the cause and NSK Engineers designed an alternative wheel design, incorporating improved sealing, easier assembly and an NSK sealed cylindrical roller bearing
- A trial was conducted using the new design and the results were reviewed. The redesign was successful with the remaining lines modified
Product Features

- High load rating
- Highly corrosion resistant phosphate coating
- Contact seals prevent ingress of foreign particles or water
- Increased radial and axial capability
- Bearings pre-greased with Lithium grease
- Re-lubrication holes for easy maintenance & grease replenishment
- Snap ring (DIN 471) can be applied to the outer ring

Cost Saving Breakdown

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<tr>
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<tbody>
<tr>
<td>Cost of 1 set of assemblies = € 4.462</td>
<td>€ 133.860</td>
<td>Cost of 1 set of assemblies = €7.089</td>
<td>€ 39.111</td>
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<tr>
<td>Cost of labour to renew 1 set of assemblies = € 297</td>
<td>€ 8.910</td>
<td>Cost of labour to renew 1 set of assemblies = € 297</td>
<td>€ 3.564</td>
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<td>Bearing life 6 weeks</td>
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<td>Bearing life 12 - 14 weeks</td>
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<td>Total costs per year à 10 changes (x 3 rotators) = € 142.770</td>
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<td>Total cost per year for 1 change (x 3 rotators) = € 42.675</td>
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Total Costs

€ 142.770

€ 42.675