

AIP – ADDED VALUE PROGRAMME

INCREASE YOUR PROFITABILITY AND RELIABILITY



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As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



The NSK company

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, The Americas and Asia are linked together in a

global technology network. Here we concentrate not only on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

Added Value Programme – designed to increase your efficiency



NSK created its AIP programme to identify additional value for the customer

It unites our core competencies – almost 100 years of global expertise in engineering and high quality bearing solutions – in order to increase the efficiency and profitability of our partners. Through our comprehensive range of services, we can support you in identifying technical problems and work together with your team to find solutions for optimising ongoing operations and maintenance processes. Final checks verify and value the results to ensure that you achieve the desired benefits. By applying our AIP approach, you can save money and time whilst increasing efficiency.



Beyond the bearing

Determining the most efficient application of bearing solutions is a complex task. This continual improvement process follows formalised procedures defined in the AIP Value Cycle, which includes our wide range of added value services, the AIP Service Offering.

AIP Value Cycle – strictly customer-centric

The AIP Value Cycle is our formalised procedure to support the initial evaluation of your processes in order to offer the best possible solution from our service and product portfolio. The AIP Value Cycle is based on many years of experience working in partnership with our customers and helping them to solve their problems.



The AIP Service Offering – tailored to your needs

Besides our extensive product portfolio, NSK also offers a comprehensive range of added value services. Based on the results of the AIP Value Cycle approach we select the optimum tailored solution for your needs.



- › Stores Survey
- › Workshop Survey
- › Process Map
- › Bearing Cross Referencing



- › Application Reviews
- › Machine Design Support
- › OEM Part Conversion
- › Diagnostics



- › Product Training
- › Application of NSK Bearings
- › AIP Training
- › Industry Specific Training



- › Bearing Condition Analysis
- › Failed Bearing Analysis
- › Lubrication Analysis
- › Material & Dimensional Analysis

Surveys: a closer look

Sometimes customers have inherent problems that go undetected for years, driving up costs and reducing profitability. That's why we take a close look at your manufacturing processes, working practices and storage. We deliver a comprehensive review which highlights opportunities for improvement.



Service

Benefits

Stores Survey

- › Documented reviews
- › Bearing Condition Assessment
- › Recommended Best Practice
- › Consolidation of stock

Workshop Survey

- › Documented assessment
- › Certificated standard for bearings
- › Continuous improvement recommendation
- › Best Practice examples

Process Map

- › Documented survey of production line from start to finish
- › Bearing Condition Assessment
- › Documented report with photographic records
- › Identification of critical bearing problems

Bearing Cross Referencing

- › NSK equivalent listings
- › Alternative products offered to improve performance
- › Alternative products offered to improve delivery
- › Replacement of obsolete parts

Selection: the perfect pairing



We collect data on your operations and the condition of your machines so that we can recommend the optimum bearing solution for you. The data is then analysed to produce the best bearing recommendation, information on machine component design, available part numbers and running conditions.

Service

Benefits

Application Reviews

- › Assessment of bearing condition
- › Selection of optimum bearing design
- › Lifetime calculations
- › Set up recommendations

Machine Design Support

- › Review of machine design
- › Recommended improvements for increased bearing performance
- › Preparation of drawings and data for housing and shaft fits
- › Documented technical report

OEM Part Conversion

- › Bearing replacement recommendations
- › Improved availability of bearing spares
- › Reduced inventory costs
- › Improved performance options

Diagnostics

- › Bearing running conditions
- › Early failure identification
- › Machine condition assessment
- › Engineering advice (performance, highlighting problems)



Training: improving your capabilities

We offer a complete range of training to support your team and make sure you achieve optimum performance – and genuine Total Cost of Ownership (TCO) savings – from our bearings in your machinery. NSK will assess your training needs and create a tailored programme to ensure your team develops the expertise required.

Service

Benefits

Product Training

- › Efficient online course
- › Perfect way to gain basic product knowledge
- › Enhances productivity (better skills in usage of Bearing Part Numbering, Problem Solver Bearings)

Application of NSK Bearings

- › Improved understanding of bearings in applications
- › Appreciation of Best Practice fitting of bearings
- › Improved knowledge of bearing failure modes
- › Understanding of bearing accuracy and its effects on bearing performance

AIP Training

- › Improves plant performance and profit
- › Structured and logical approach to solving bearing problems
- › Greater awareness of opportunities for continuous improvements
- › Genuine TCO savings

Industry Specific Training

- › Tailored training focussing on common industry applications, issues, equipment types and industry challenges
- › Examples of NSK solutions for specific industry sectors



Inspection: ready to improve

Many factors affect bearing performance. NSK analyses of used and failed bearings to identify the root cause of problems and makes recommendations for improving both the machine condition and the correct selection of bearings.

Service

Benefits

Bearing Condition Analysis

- › Visual and tactile test results
- › Early wear indication
- › Non destructive tests
- › Fully documented report

Failed Bearing Analysis

- › Full investigation into failure root cause
- › Problem solving solutions
- › Detailed engineering explanation
- › Fully documented report

Lubrication Analysis

- › Lubrication identification
- › Water contamination indicators
- › Particle contamination indication
- › Lubrication condition report
- › Investigation into failure root cause

Material & Dimensional Analysis

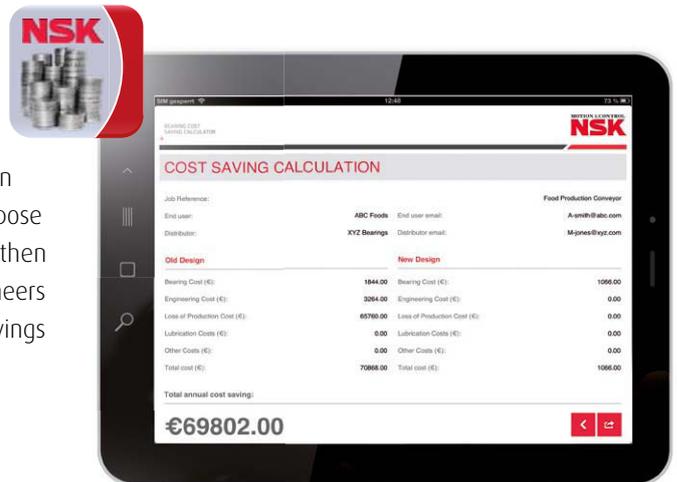
- › Metallurgical examination
- › Failure initiation identification
- › Dimensional analysis
- › Investigation into failure root cause



Service at your fingertips

Cost Saving Calculator App

Changing a bearing design can result in huge savings. We measure these for you. Elimination of downtime and production losses generates the biggest cost reductions. We dig deep to propose the perfect solution, always on a TCO and ROI basis, which we then illustrate with our specially designed NSK app. It allows our engineers to collect data directly at your facility and give you an instant savings estimate for a new design.



Survey App

Detailed surveys are an integral part of the AIP program. These allow us to investigate your processes and highlight opportunities for improvement. Not only that, by performing on site surveys we can also collect key data needed to apply the optimum bearing solution for your machines. It is a thorough and detailed operation and to aid this we have created an App that allows for collection of data in the most efficient way. This will automatically create survey report with relevant action plans, photographs and prioritised ranking score for each machine.



Solutions App

The NSK Solutions App is designed to illustrate the AIP journey and discover the benefits. It guides the user through a typical AIP process and explains how each of the services included are performed giving both their benefits and real life examples. The Solutions App also allows the user to discover how AIP is applied in the key industry sectors giving details of successes where NSK solve problems together with generating significant cost savings.



Best practice is best shared



NSK's AIP Programme is designed for success. Our worldwide industry expertise is renowned in many sectors and turns the projects at our customers' sites into success stories. Our best practice Success Stories can serve as inspiration for your processes, backed by our wealth of experience, which gives you full confidence. We are happy to share our knowledge to help you increase your profitability and reliability.

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Success Story

Industry: Automotive Production
Application: Machining Centre
Cost Savings: €190.992

Introduction
A large manufacturer of automotive engines was having increasing reliability issues with its machining centres. This had a severe effect on manufacturing output resulting in increased costs and reduced machine productivity. Following a failed bearing analysis it was revealed that the cutting fluid was entering the bearing which was severely affecting the lubrication. NSK proposed a sealed spindle bearing with significant improvements in bearing life.

Key Facts

- Machining Centre Vertical Spindle
- Malfunction of the machine due to coolant that entering the bearing
- NSK Solution: Sealed Super Precision Bearings
- Increased life-time
- Reduced down-time
- Cost saving for bearings and maintenance




↑ Machining Center Vertical Spindle ↑ Sealed Super Precision Bearing

NSK Europe - <http://www.nsk.com>

aip SS-E-7000
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Background Information

- Sector: Automotive Production
- Application: Machining Center Vertical Spindle
- End-product: Automotive components
- N° of machines: 18 spindles
- Country: Spain

• Problem: Tooling Coolant entering the bearings damaging the lubrication grease, which finally seized the bearings resulting in malfunction of the machine

• Approx. Lifetime: 4 months

Value Proposals

- Realisation of an AIP Process Map
- NSK Failed Bearing Analysis showed damage to the lubrication due to coolant entering the bearing
- NSK proposed Sealed Super Precision Bearings

• Implementation of training for the Super Precision Bearing's mounting process

• Machine design consultancy for associated housing components

Product Features

- Non-contact seals
- Time saving: Bearing mounting time 4 × faster and contamination through poor handling eliminated
- Non-contact seals provide valuable protection; reducing raceway and ball surface wear, noise and vibration, lubricant breakdown
- No speed reduction due to non-contact seals

• Improved spindle performance

• Operates between horizontal and vertical positions

• Sealed bearings prevent grease migration in vertical spindles, promote temperature stability and provide higher accuracy machining

• Longer grease life: extended by 50% with sealed bearings

Cost Saving Breakdown

Before	Cost p.a.	NSK Solution	Cost p.a.
Old bearing costs	€21816	New bearing costs	€7224
Bearing life	4 months	Bearing life	More than 1 year
S4 replacements × 4 hours / replacement × €50/h	€10800	12 replacements × 4 hours / replacement × €50/h	€2400
Production costs: S4 replacements × 4 hours / replacement × €1.000/h	€216.000	Production costs: 12 replacements × 4 hours / replacement × €1.000/h	€48000
Total Costs	€248816		€57624

aip SS-E-7000
NSK experts

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