Optimize gearbox design with SKF Engineering Consultancy Services

**Benefits**
- Increased power density
- Increased reliability and performance
- Improved energy efficiency
- Reduced noise emission
- Reduced time to market
- Reduced product life-cycle cost

**Applications**
- Systems
- Sub systems
- Components

**Improve gearbox performance, value and time to market**
Industrial gearbox manufacturers are continually challenged to provide more value to customers, by designing products with improved performance and reliability and reduced product life-cycle costs. Manufacturers who can do so can significantly shorten time to market, greatly enhance their return on development investments – and gain an edge over the competition. But, that’s no easy task.

Technical development projects require a variety of specialists, from those focused on advanced calculations to others with expertise in materials. Manufacturers without the appropriate on/staff resources may face high costs associated with subcontracting these vital competencies – costs that cannot always be forecast or offset. Unexpected problems can also develop during testing, or in the worst-case scenario, in the field. To protect their reputation and minimize warranty/liability costs, manufacturers need to rapidly identify the root causes of these problems and their solutions.

**SKF Engineering Consultancy Services can help**
From product design to development testing and trouble shooting, SKF Engineering Consultancy Services (ECS) can enhance the ability of gearbox manufacturers to innovate and compete. SKF ECS includes experts in material science, lubrication and tribology, with access to unique calculation and simulation facilities. SKF ECS team members work closely with SKF gearbox experts, and have the support of SKF’s state-of-the-art laboratories and research centers.

**The SKF ECS advantages**
SKF Engineering Consultancy Services (ECS) experts can help gearbox manufacturers increase power density, reliability and performance, while improving energy efficiency and reducing noise emission. Just as importantly, an ECS consultant can provide solutions for reducing time to market and decreasing product life-cycle costs. SKF ECS services include;

- **New machine development.** SKF ECS experts can replace costly and time-consuming physical testing by using proprietary software to analyze gearboxes – including bearing and all other components – while still in the design stage. The resulting analysis can then be used to identify areas for performance and reliability enhancements.
- **Design verification.** Test strategies can be developed by SKF ECS consultants to efficiently validate designs, and to evaluate the performance of tested components in prototypes. Using unique computer tools, gearboxes can be modeled and actionable, reliable recommendations can be provided.
- **Problem solving.** For gearboxes that are not performing as anticipated, SKF ECS specialists can conduct a root-cause analysis, combining computer modeling and simulation analysis with material science and gearbox knowledge. This analysis will result in hard data that can be used to solve the problem.

For more information about SKF products and services for industrial transmission applications, contact your local SKF representative.
Applying SKF knowledge engineering to improve your gearbox performance

SKF Engineering Consultancy Services can help you get more out of your gearbox design. This may mean improving product reliability, speeding delivery times, reducing warranty claims, and much more. Below are examples of SKF Engineering Consultancy Services at work for gearboxes.

SKF Engineering Consultancy Services solutions

Enhanced power and performance

Using advanced simulation tools, SKF Explorer bearings, engineered materials, special lubricants, and on-line sensorized monitoring, SKF designed and built a gearbox for demonstration purposes, including:

- 12% increase in power density
- 20% reduction in weight
- 25% reduction in volume
- 20% reduction in oil and energy consumption

Trouble-shooting and redesign

When a gearbox customer experienced premature bearing failures, SKF ECS combined material and oil analysis with computer simulations to identify the root cause problem and possible solutions. SKF ECS then helped the customer redesign the gearbox, applying Design for Six Sigma techniques. The bearing arrangement and type of gears were changed, and the redesigned gearbox now has the potential for a 500% increase in service life, and a 50% increase in speed/productivity.

Improved reliability in wind turbine gearboxes

SKF is working with the U.S. National Renewable Energy Laboratory (NREL), bearing and wind turbine manufacturers, and wind farm owners and operators to address specific gearbox reliability issues. Part of this initiative involves full-scale testing and analysis of actual gearboxes, both in the field and in a test facility. SKF is modeling the complete gearbox, including the planetary stage, and comparisons to different arrangements. Design for Six Sigma is being used to systematically select the input parameters to simulate, determine how many and which simulations to run, identify the most critical operating parameters, and select the best bearing arrangement.