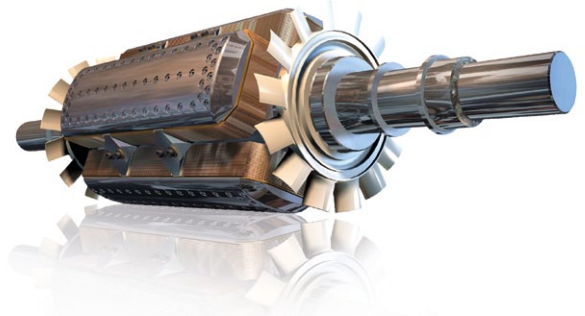
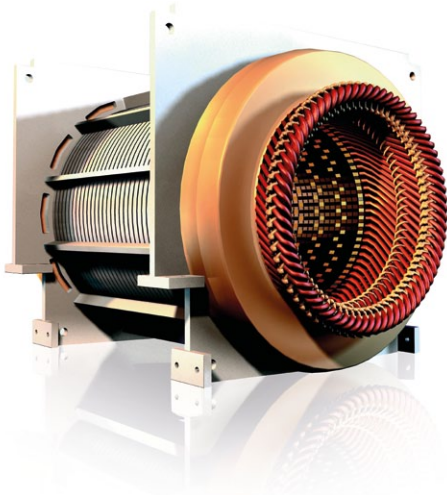


Service note

Capital spares for motors and generators



The need for capital spares

ABB's motors and generators often play a critical role in the plants in which they operate. In many cases the complete process would be brought to a halt if the motor or generator stopped working.

Downtime may result in considerable costs in terms of lost production, waste and damage. Therefore the availability of this equipment is a top priority.

When unexpected downtime must be kept to a minimum, capital spares often represent the optimum investment and provide the basis for maximizing operational availability.

Aging and reliability

All equipment is subject to aging through stress caused by factors such as operating and ambient conditions, poor maintenance, and other.

ABB equipment is highly reliable and designed for trouble-free operation over its entire lifetime. However, aging related factors may eventually lead to a failure.

Any unplanned stoppage is costly and component failure may result in consequent damage to vital parts such as the stator and rotor. It is therefore very important to be fully prepared in case a failure should occur.

Downtime versus delivery time

In the case of a serious component failure, the operational downtime is in direct proportion to the delivery time for the required spare parts. To maximize availability it is therefore important not only to perform proper maintenance but also to keep a stock of essential spare parts on site.

Rotors, stators and other capital spares are typically designed for a specific project and have to be custom manufactured. This means that such components have a significantly longer delivery time than standard spare parts.

Customer benefits

Keeping essential capital spares on site is a good investment that provides a number of benefits:

- Minimized downtime in case of failure
- Minimized production loss in case of failure
- Use of a single component as a capital spare for several motors and generators
- Excellent overall risk management strategy

The optimal capital spare for every case

A range of capital spares is available for ABB's motors and generators. Some examples are:

- Complete spare motor/generator
- Complete rotor
- Complete stator
- Exciter rotor and stator

Determining the optimal capital spare for every case is a matter of performing a risk analysis and reviewing the specific case from the motor/generator viewpoint:

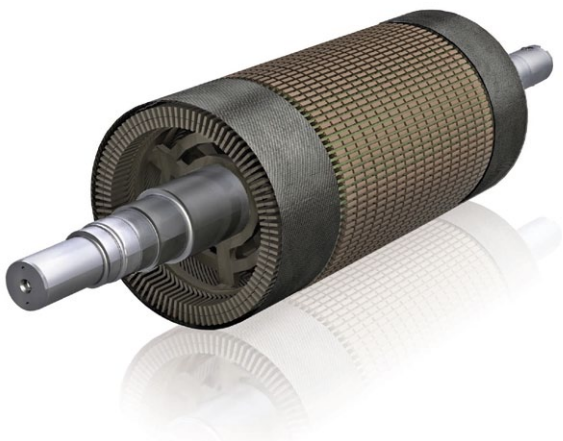
- What component is subject to the greatest stress?
- What are the ambient and operating conditions?
- What are the original design parameters?
- What is the motor/generator application?

ABB's specialists can apply their vast experience to help determine the optimal capital spare for each case by performing site surveys and motor/generator diagnostics.

Capital spares versus repair

While repairing a damaged component may prove a good temporary solution in many situations, keeping capital spares on site will always be a better option.

- Repair is not always possible
- A repaired component is never as good as a new one
- Capital spares mean shorter downtime
- Capital spares carry a full factory warranty



Business risk analysis

The key element in risk management and the goal of minimizing production disturbances is to be proactive and fully prepared for major failures or other serious events.

In order to get a clear overview of the situation and determine which preparatory actions need to be taken, the owner should perform a thorough risk analysis. The following factors should be considered:

- Are we prepared for a failure?
- How long might the downtime be?
- What is the production loss per day?
- Will there be delivery problems?
- What is our total downtime cost?
- Do we have or can we easily obtain spare parts when needed?
- Can we use the same capital spare for several motors/generators and sites?
- Will our insurance costs be lower if we keep capital spares on site?

Expected downtime

The table below illustrates how a serious failure may affect availability and how downtime will be significantly reduced if capital spares are kept on site. Note that the table is an example only: the actual downtime depends on the motor/generator type and size.

Spares / failure	Expected downtime
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No capital spare

Rotor failure	Several months
Stator failure	Several months
Exciter failure	Several weeks

Capital spare on site

Rotor failure	Days
Stator failure	Days – weeks
Exciter failure	Days

Complete spare motor/generator

Any failure	Days
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Return on Investment

An analysis of the risks and benefits clearly shows that the payback time for capital spares is very short when the downtime costs that would otherwise result from a failure are taken into consideration.

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