Retrofit service: breathing new life into existing drives installations

Drive life cycle services become increasingly important as a company’s drives installed base ages, preventing breakdowns and improving drive asset productivity and reliability. Retrofit service in particular can unlock the potential and optimize the life cycle of aging drives.

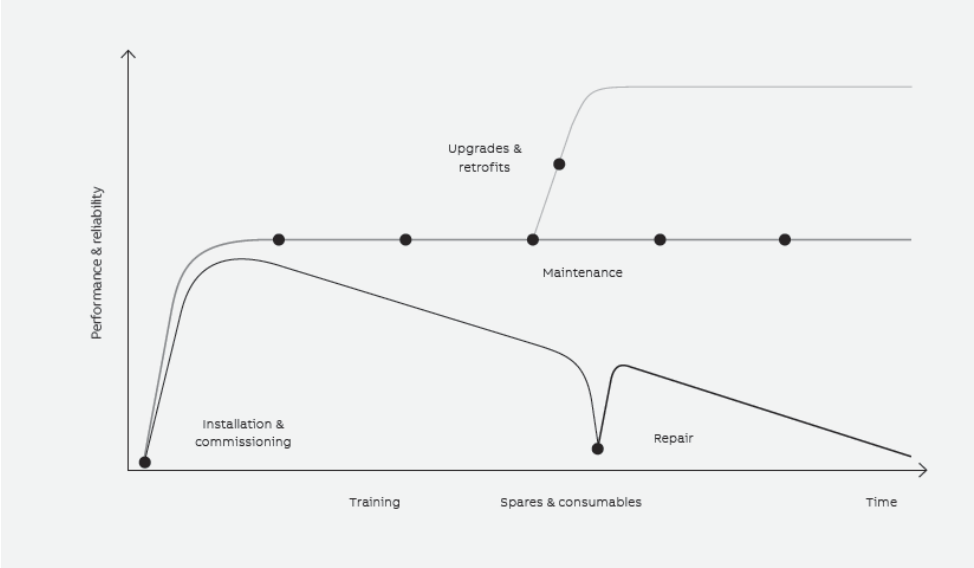
As companies increasingly focus on their core competencies, the need for services from drive suppliers increases and becomes a more critical part of their operations. Drives are an essential part of many different industrial processes, providing energy efficiency, improved productivity and high performance to electric motors in a variety of applications. Thus, when a drive breaks unexpectedly, it can bring operations to a halt and cause a broad range of problems for the company.

Service is a key

The best strategy is to prevent a breakdown before it happens. During the product`s life cycle, this typically means regular preventive maintenance. But for an industrial drive at the end of its life cycle, retrofit or replacement is the best solution for minimizing the risk of breakage and unplanned production shutdowns.

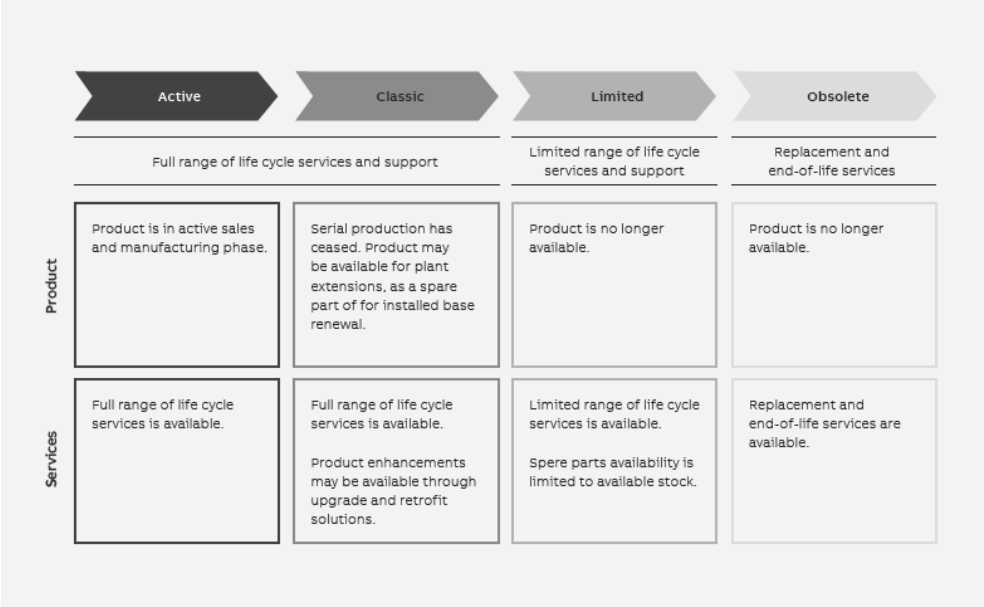
A retrofit solution is often tailored according to the customer’s specific needs

Simultaneously, these two services will often improve a drive`s performance.



A product's performance and reliability over time

Building upon the life cycle management thinking, ABB has developed a life cycle management model to demonstrate a drive´s performance and availability throughout the product´s life cycle.



ABB's life cycle management model

This model, as presented in the figure, divides a product's life cycle into four phases: active, classic, limited and obsolete. In a product´s active and classic phase, ABB's products have a full range of services and support available. In the limited and obsolete phase, on the other hand, often the only available and thus recommended services are replacement and retrofit, which, in addition to updating the drive, will also return the product's life cycle status back to active.

Because industrial companies have several different maintenance strategies for their investments, ABB's broad offering allows them to choose the drive services that best support their strategies. As part of the life cycle management model and ABB's service offering, retrofit supports replacement service and other solutions to provide different drives maintenance options for ABB's customers.

History of retrofits

The starting point for designing a retrofit is often complicated since retrofits require sophisticated engineering skills to deploy the newest drives technologies into the various generations of drives products while keeping in mind the customer´s needs like fast installation time, customization needs and the variable conditions on site. To efficiently provide ABB customers the best-value cost, ABB started a project to standardize its retrofit offering in late 2000s. In 2007 Marjukka Virkki, Finland's current country service manager, was working as a drives service R&D manager and simultaneously managed the retrofit standardization and concept development project:

"When I started working as a retrofit project manager in 2007, I realized that to scale up the production volume of high quality retrofits for all potential customers, we cannot sell every retrofit solution on a case-by-case basis. Sure, a case-by-case ensures a design based on the customer´s exact needs, but it can challenge the quality of documentation and the installation time after sales support. Additionally, it was not possible to optimize the supply chain to achieve the product cost targets. Based on customer feedback, we needed to decrease our delivery times and, together with the volume increase, this would not have been possible without standardization. We further needed to increase our field service capabilities as the number of installations was growing globally and therefore the need for high quality documentation and training material and courses became more evident. A continuous learning process was set up to decrease the probability of risks materializing. We started the development work by assessing the market situation and needs and, with the help of a small project team, we continued by defining product structure with standardized subassemblies and by creating documentation, instructions, and process descriptions. In close cooperation with sourcing, we selected the suppliers and built up the volume production line with clear KPIs and targets."

Retrofit service development has always been about the customer and meeting the customer´s needs. Marjukka further explains how to ensure the best quality service for the customers:

"In the retrofit service development we aimed to primarily use the same components as in the newest drive products. Consequently, the installation and assembly would be more efficient and the retrofit´s reliability would be improved, as the existing components had already been tested and approved by the product factory. We further used the existing design and documentation standards and ways of working in the product development. Fast forward to today, everything from air gap dimensions to controlling electrical eddy currents in retrofits are expected to meet the same design criteria as our new products. This too illustrates our high-quality standards."

Today most retrofits are delivered as a standard package. By utilizing continuous learning principles, ABB ensures the highest quality and most cost efficient retrofit solutions with fast delivery and installation times. Additionally, the standardized packages can minimize the time and risk of retrofit projects. Even though standardized packages provide many advantages, ABB still develops some retrofits on a case-by-case basis to ensure that the customer´s various needs are fulfilled. In all ABB's retrofits, systematic documentation methods, quality assurance and highly trained engineers ensure the high quality and long lifetime of the drives.

Successful new service products pilots

Under new service development, ABB has successfully executed several pilot projects in multiple countries with customers operating in numerous industries, such as paper and pulp, metal, mining and food and beverage. Through these pilot projects, ABB ensures the reliability of new retrofit designs and verifies the functioning of internal processes from order to delivery until final installation and commissioning of the retrofit.

One of these pilot projects was successfully conducted with SSAB, who, following the pilot, made a decision to modernize all of the drives in its galvanizing line 3 at its Hämeenlinna, Finland plant. The project in total includes retrofitting 151 drives, which are to be installed in a step-by-step manner over a five-year period.

151 aging ACS600 drives at SSAB's Hämeenlinna galvanizing line 3 will be modernized within 5 years to ensure their maintainability and reliabilit

SSAB is a global steel manufacturer that focuses on highly specialized steel products. The company is a leading producer of advanced high-strength steels, as well as quenched and tempered steels. SSAB's Hämeenlinna plant's galvanizing line 3 produces zinc-coated steel plate for the construction and car industries. Its smooth operations are crucial, since the line's highly specialized products cannot be manufactured elsewhere.

A tailored retrofit

Some years ago ABB informed SSAB that the ACS600 drives were approaching the end of their life cycle and hence the availability of technical support and spare parts would become limited in the future. After considering multiple options, SSAB chose ABB's retrofit service to modernize and restore the products back to the active life cycle phase.

"The step-by-step retrofit was a good solution for us," says Tero Saarenmaa, Electrical Maintenance Section Manager at SSAB's Hämeenlinna. "It gave us the possibility to do effective preventive maintenance with the original spare parts, while getting full support and service on these crucial drives. In addition, the project allowed us to utilize the old products as spare parts for the older ACS600 drives until the retrofit was completed. The overall cost-effectiveness and reduced shutdown time were key elements for us in choosing the retrofit service."

Additionally Matti Aaltonen, ABB drives and controls service sales manager, added that the ability to tailor the solution specifically to SSAB's needs was important. "Since a standard retrofit solution didn't fully fit their requirements, we tailored a solution according to SSAB's specific needs. So all the components inside the old cabinets are being removed and ACS880 tailored retrofit kits for the wider ACS600MD cabinets are being installed.

Old drive (left) and retrofitted drive (right)

Control of the drives will still be implemented with the existing AC80 control system, with some modifications to the AC80 software. The scope of the project includes commissioning and the minor program changes for the new ACS880 drives will be carried out during each maintenance shutdown."

Modern service business

While the reasons behind a customer´s decision to choose a retrofit service vary, there are some clear advantages. One of the most common reasons to choose retrofit is that the service enables companies to make new step-by-step investments rather than relying on a one-time investment. The retrofits do not only decrease the customer´s capital expenditure since investments can be made over a longer period of time, but the service also allows the installations to be made during shorter production breaks. The retrofit further benefits from the new technologies and therefore also often increases the efficiency of the drive. For example, new drives generations have embedded capabilities for remote connection and self-diagnostics that enable remote support and condition monitoring services, improving the availability and optimization of the drive and the response time in case of failure. Additionally, by using an existing drive's cabinet, cables and motors, the customer saves a significant amount of money and time as there is no need to re-engineer or work out any changes, for instance in the cooling system or cabling.

As the global population stretches the earth's resources to the limit, a company´s environmental impact and use of resources have become increasingly important. To this end, the retrofit service minimizes material waste by using the existing cabling, motors and cabinets, while simultaneously employing the latest technology with better tools and diagnostics.

ACS880 retrofit for ACV700/SamiStar mechanical design with 2 modules.

According to one pulp and paper case study conducted by ABB in 2015, retrofit's total CO_2 emissions were over 65 % less than a new line up; the CO_2 emissions for a new line up added up to 6 405 kg, while the retrofit kit's emission were only 2 215 kg. This was saved both in production and transportation of equipment.

A retrofitted drive is guaranteed with an up-to-date drive system and product support. Retrofitting drives is a fast and efficient way to modernize an installed base, bringing immediate performance improvements to the customer's plant and process. Through retrofits, the customer is further guaranteed a full range of life cycle services and support for years to come.

For more information please visit:

http://new.abb.com/drives/services/upgrades-and-retrofits/retrofit

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