

Case story: Metsä Fibre Joutseno | DrivePro® Services

# Metsä Fibre Joutseno optimizes utilization via world-class lifecycle planning

## 98.5%

equipment  
utilization goal

**Metsä Fibre's Joutseno pulp mill in Lappeenranta is the world's largest single-line softwood pulp mill and has been in operation for more than a century. The mill is among the best in the world for both efficiency and environmental considerations. A utilization goal of 98.5% has been set for equipment throughout the plant, which requires solid life cycle planning and proactive maintenance, to optimize production processes. For more than 20 years now, hundreds of drives in the VACON® product family have been supporting Metsä Fibre's pursuit of this aim. With solid life-cycle expertise and a number of DrivePro® Retrofit projects to its credit, the Joutseno mill ranks among the best in the world for utilization and reliability.**

Its long-standing cooperation with Vacon Oy began in 1995, when the mill tested some new units to replace old DC drives. The tests prompted the mill to invest in about a dozen VACON® drives. The mill is still using 3–4 high-speed motors from those days, controlled by VACON® CX drives.

Significant upgrades have taken place over the years: The mill's device base was replaced in 1998 and 2000, and hundreds of VACON® CX units were introduced. In the last few years, Metsä Fibre has been replacing these units. Thus, over the years, Metsä Fibre's Joutseno mill has carried out several DrivePro® Retrofit projects. Metsä Fibre replaced the sectional drive in 2008 and initiated discussions about the introduction of Vacon Oy's replacement service in the same year.

### Preventive maintenance based on criticality assessment

The life-cycle renewal program is based on criticality classification. All the electronic devices at the mill have been grouped into three categories. The criticality classification considers the impact a failure could have on production within the department and mill-wide, along with environmental and safety considerations. In addition, replacement speed and availability of spare parts can affect the criticality class. The mill's maintenance staff plans the spare-parts policy and such measures as preventive maintenance, on the basis of the criticality class.



VACON® drives in the pulp mill's control room  
Image: Metsä Fibre Oy

Careful life cycle planning for the years ahead reduces the workload and ensures that the utilization goal will be met. In recent years, the mill has replaced dozens of drives, around 15–20 units annually. In 2020, Metsä Fibre replaced category-3 VACON® CX devices, installed in 1996 and 2000.

## VACON® drives optimize operation of critical applications in the pulp mill

The mill operates with a single line, so if one device stops, the whole line comes to a halt. The most critical applications at the mill are the pump, fan, and worm drives. In addition, the mill has a sectional-drive application based on standalone drives for the dryer. At the moment, there are 130 VACON® drives in category 1 (from the VACON® 100 and VACON® NX product families) in use at the mill.

Life cycle planning is very important, and is necessary in understanding when the equipment has to be replaced. Danfoss Drives praises Metsä Fibre, for instance, for the replacement intervals of the critical fan drives. In addition, Danfoss Drives provides a utilization guarantee for the equipment. "We guarantee that the drives will operate at the required 98.5% level for a full year," says Key Account Manager Jari Ollila. In 2008, Metsä Fibre purchased devices for use as spare parts for the sectional drive, but the mill has since started using the Danfoss Drives replacement service. The benefits with this service are the 24-hour technical support; short response time for replacement-device deliveries, which reduces production downtime and losses caused by interruptions to production; products that are always ready to use; and the availability of on-call support services in case needed.

Metsä Fibre's Joutseno mill still uses some highly critical equipment (in criticality class 1) and stores spares for that equipment on-site, to guarantee fast replacement and avoid production downtime.

## A process model emphasizing life-cycle management

All operations at the Metsä Fibre Joutseno mill are designed for maintaining high reliability. "During a recent mill stoppage, we replaced several dozen fans, in various locations, in accordance with their criticality class. These activities are all aimed at making sure there is 98.5% utilization across the entire mill site," says Pekka Kettunen, Maintenance Engineer for Reliability at Botnia Mill Service Oy.

Since the Metsä Fibre Joutseno mill has hundreds of drives, with various criticality levels, life-cycle planning is very important for reaching the goal of high utilization. The life-cycle planning is guided by a process-management model in which investments, maintenance, large-scale repair processes, and planned downtime follow an annual schedule. In spring, the mill's maintenance personnel make a preliminary plan for replacing equipment, on the basis of the items' criticality class and stage in their life cycle. At the end of the year, they review the life-cycle projects and decide on the measures to be taken in the following year. Preventive maintenance measures are registered in the maintenance system. The devices are inspected each year by the local DrivePro® service partner, Caverion, authorized by Danfoss Drives.

## An open and confidential customer relationship

Kettunen, who is responsible for reliability at Metsä Fibre's Joutseno Mill, praises Danfoss Drives for how well it tends customer relations: "A long customer relationship must involve trust. If I have asked for a reply to something, it will come in due time, and promises are kept. I can count on getting an honest answer, and potential utilization risks are identified in time. This has worked since the time of Vacon Oy, and Danfoss Drives is addressing the challenges."

Kettunen has always maintained open contact with Danfoss Drives' technical experts, who have given him useful advice right away, for example on parameterization and the configuration of drives as needed. He says, "We get a lot of value from Danfoss Drives being open about things that affect the life cycle or service needs of the equipment."

In addition to the DrivePro® Retrofit program, the more general collaboration between Danfoss Drives and Metsä Fibre's Joutseno mill will continue far into the future. Today, Danfoss Drives and Metsä Fibre are exploring the possibilities of using data collected by the drives in order to develop preventive maintenance. The project explores how the data can be processed into useful information.

## DrivePro® Site Assessment adds value for the customer

To support improved life-cycle planning, Danfoss Drives offers its customers the DrivePro® Site Assessment service, in which AC drive specialists collect data from the units installed. The information thus obtained is used to conduct a risk assessment that considers the equipment's condition, life-cycle phase, and criticality for the process. The customer receives both a summary of potential risks connected with the device base and maintenance recommendations that are defined in line with the customer's maintenance strategy. This results in the highest possible reliability and performance of the equipment.

"The DrivePro® Site Assessment service involves visits to the customer, with tours of the premises alongside local workers, during which we collect drive data critical for our purposes. We provide maintenance recommendations and suggestions based on this, which will be discussed with the customer and used in planning annual maintenance measures for the coming years. This helps customers significantly in planning their future budgets," says Danfoss Drives Finland's Aftermarket Service Manager Pasi Ihainen.

In addition to an open and confidential customer relationship, Danfoss Drives wants to offer its customers special added value by supporting the life-cycle planning of the device base.