



@ CARTIERA VERDE ROMANELLO

...TOGETHER WITH THE COMMITTED PAPER MILL ELECTRICAL TEAM, SAEL HAS RENEWED THE CONTINUOUS MACHINE DRIVES BY "REBORN" – THE DIGITAL INTELLIGENT DRIVE -. FROM TODAY ON, THE MACHINE IS MANAGED BY AN INTEGRATED SUPERVISORING SYSTEM AND I.W.S.A. FOR PAPER INDUSTRY (I.W.S.A. IS THE INTERNET REMOTE ASSISTANCE). WITHOUT OTHER IMPROVEMENTS, THE MACHINE PERFORMS THE **30% MORE**.

art in rebuilding...

Romanello

by: **Paolo Andrighetti SAEL s.r.l.**

The present economical and market situation in Europe, does not encourage investments by the Paper Mill owners: either on new machines or electrical rebuildings. However the continuous machines efficiency – under control even at the small manufacturing entities – is getting more important. Every production stop caused by electrical problems causes losses, and it is a real

headache for the responsible people on site.

The careful cost reduction analysis, technical wise, allowed **Sael** to jump into this topic, being one of the most important automation supplier today. Since ever the Company involves the customer from the engineering of its machine up to the learn-in-progress of the drives, steps – all the Drive courses are free of charge -. Thanks to this process as "experience

exchanging", the best ideas came out and became projects and concrete focused solutions on re-using old parts, especially.

The investigations made by Eng. Pietro Paulon and Mr. Eros Milocco – the Factory Managing director and the Electrical Maintenance Manager – at **Cartiera Verde Romanello**, showed that Sael, with its **Reborn**, had the best solution to solve the problems encountered on the old DC Drives.



Wet zone MC2 - Cartiera Verde Romanello, April 2011, "REBORN" SAEL



Cabling inside Papermill of the new cabinet-desk to control the wet area

Actually the Reeborn solution saves almost 50% of the costs. Paolo Andrighetti – Sales Manager B.U. Paper – highlights the fact. Reeborn allows to re-use all the original spare parts because the existing power sections of the drives are maintained, as well as the electrical equipments.

Reeborn can be applied to all the drives on the market and without size and SCR power section applied..

Talking about Cartiera Verde Romanello there were three different drives: today, thanks to this modification, there is only one. The supervising system works on the production methods getting them better and efficient. The system diagnostic built-in permits the quickest drive investigation in case of fault.

The Cartiera Verde Romanello

Born on 1925, the plant is based in Campofornido (UD). Its must is the paper paroduction starting from the recycled fibers. On 1955 the paper mill diversifies the production – it was grey and yellow paper only for packaging – rising up the food bags as well. On 1962 builds the automatic plant (by VOITH) for the pulper, and between

the 1964 and 1965 the MC2 Contonous machine was replicated in order to produce wave cartons for industrial packaging.

On 1974 the fourth continous machine for the bags, was built and got named MC1. At the end of 1984 the MC1 was dramatically modified for printing paper production – starting from the fibers like the beginning -.

On 1984 the department was closed and the machines sold; the manufacturing shifted to the two main productions: Newspaper and packaging papers. Between the 1987 and 1988 was built the de-inking raw material line. On 2000 the paper mill made a new line for stock prep – having the DCS who manages the tree prep departments together.

The project Steps

The MC2 drive – subject of the job – was originally based on different equipments/cabinets placed in different spaces within the paper mill. The 22 existing motors were driven by EEI ABB and SIEL Peterlongo Drives (added along the way) and managed as a cascade analogical-digital with no longer spare parts available, today.



Existing cabinets view before the “REEBORN” revumping

After a careful survey and matching the time line available between the stop and the re-start (five days maximum), We offered a “multiple step” solution, allowing to spread the costs over the time. The first step, made on April 2011, re-converted the humid zone drives (the most damaged) using an architecture that supports the main drive conversion without PLC S5 modifications – to be made later on vs. a S7 -.

Already used many times in different plants, Cartiera Verde Romanello has married our classical renewing philosophy too. Before we apply the Reeborn to the drives having a digitalization of the cascade refs, and then we work on the PLC – n.d.r. Paolo Andrighetti -. Actually, Our drives, in the opposite of the ecompetition, are made for that! Without any cascade co-ordinator (PLC – microprocessor boards – DCS) which every competitor need, they exchange informations generating the speed refs, reg. loop, load spread, by the boards. After a first step where the problems are fixed, we move ahead with the second step who involves the Reeborn application to all the existing drives.

The REEBORN system by Sael



Different drives view after the “REBORN”

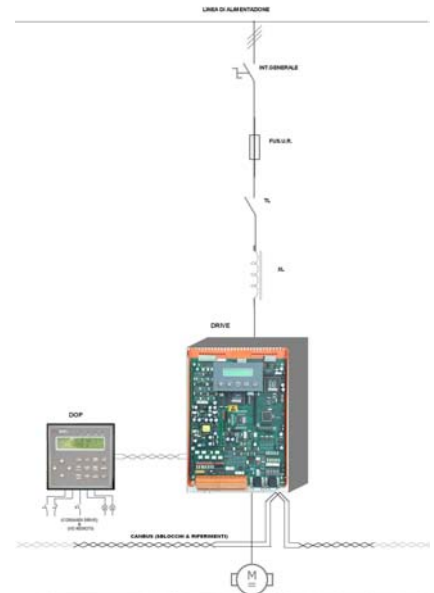
After a preparation step, the electrical cabinet wiring was made by the paper mill operators themselves. The preparations started some weeks after by the driving motors DOP “Digital Operator Panel” wirings. The existing encoders have been re-used, as well as re-placed the old pulper displays with new DOP video-keyboard (up to 8 drives re-digitallized by the Reeborn; managed via supervising station).

The Paper Mill electrical staff, well prepared at Sael, did an excellent job on wirings and the start up as well. In four working days vs. five planned, all the pulper and drives wirings were completed, and the machine was ready to produce.

The CANBUS Sael system is an “inside cabinet bus” – high performing and very fast – and its limit is on the cable length: 30 meters maximum.

To maintain the high performance of the system, two Mastercan board have been used: each of them had to canbus networking inside.

Each board manages its own motors area and the cabinets with drives; the data transmission and the cascade refs have been shifted to the second board with canbus net (CAN SYNC).



Up to 50% savings by – recycling the old drives -
The old drive will be renew after installation of “REEBORN” Kit and cabling the network

Today, the new system expansion, is comparable to a 150 motors section and can be implemented in the future, either to the wet zone or to the dry one. Eventually, the drives can be placed at the beginning or at the end of the machine without restrictions. The DOP – made for a motor management, placed on the pulpers – is awarded as simple as intuitive by the Paper Mill operators. Just few



“REBORN” tests on site

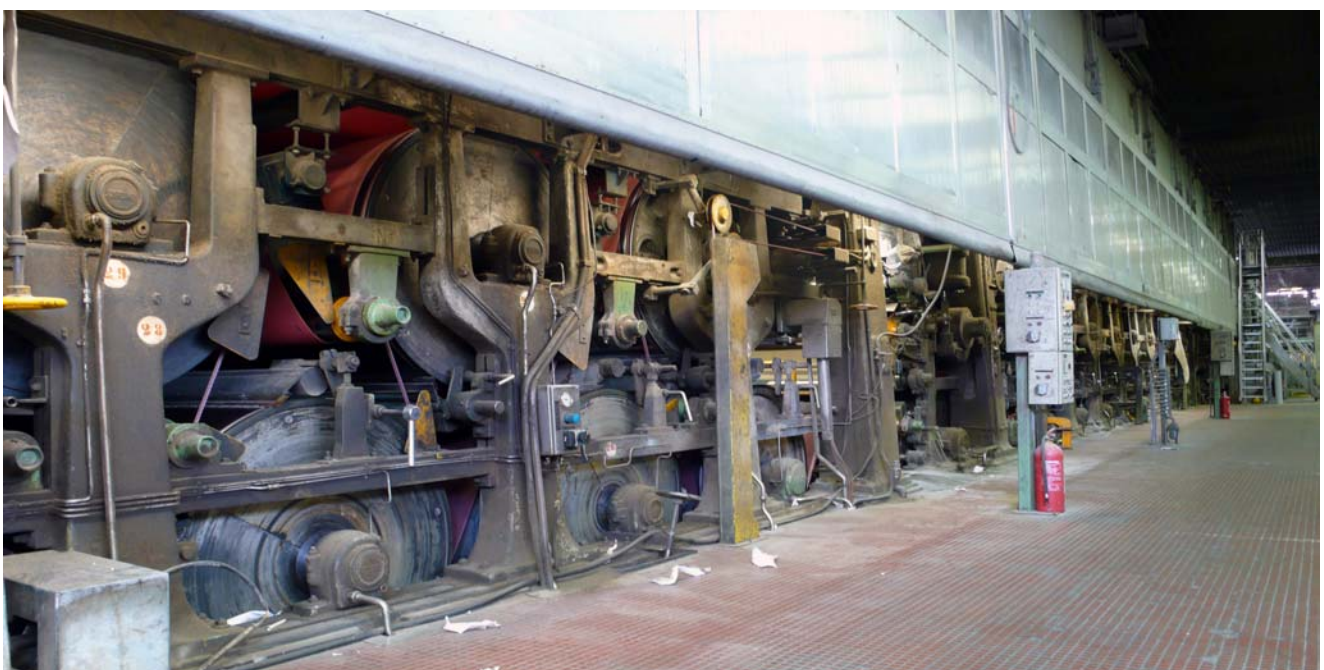
minutes of training and the people was ready to drive the machine at the best of its performances. The DOP displays every single motor current, speed and alarm, and manages all the speed modifications on demand. The input can be twisted from the touchscreen to the pulper with physical buttons. In case of pull regulation by a load cell, the DOP can display the pull set, the real pull, the speed adjustment data, setting the parameters via

software. In case of load distribution, the DOP can display the distribution set value, the real distribution as well as the motor speed adjustment in case. From the display it is possible to set the distribution parameters, and by the key, the regulation set point (proportional and integral). The system “as is” allows a.c. motors implementation in the future. Our system accepts a.c. or d.c. drives splitting the loads between them,

eventually – Mr. Paolo andrighetti n.d.r. – Either the sophisticated communication protocols or the supervising system, can be seated and work in any environment – heavy duty especially -. They are made and tested for steel industry, welding systems and so on.

To add a motor into an existing drive is very simple: join a shielded cable to a drive into the CANBS network and link the hardware- That's it! This system is used by the most European and Italian Paper Mill Groups – Mr. Paolo andrighetti n.d.r. – and it is highly appreciated by the operators because is friendly user, fulfills any winder, calander need at the time.

The regulation gets the refs from the a.c. or d.c. frequency converters and it is supported by a CAN BUS (1Mbit/sec.) high speed Multimaster network. This makes the difference vs. the traditional other PROFIBUS Master/Slave systems in the market – Too many spots in the network cause the communication speed slow down. Our cascade ensures 6 msec. speed up to 60 a.c. or d.c. motors. On top of the main values, the high



Dry MC2 - Cartiera Verde Romanello, April 2011, “REBORN” SAEI

communication speed, together with its specific protocol, allows to get the speed, current, alarms and each drive refs, simultaneously.

Practically, the basic architecture regulation, through a “listening” Mastercan board inside the network and the supervisor, we get Trends, diagnostics, system sets, and other main functions – Mr. Paolo andrighetti n.d.r. -

Our supervising system can be considered a DCS engineering station where all the drive settings, communication, Mastercan and PLC programs are accessible. A trustable, tough and rough, system.

Over 15.000 hours of test between Sael and CO.EL.ME. This system can store every single Drive communication.

The integration of the supervisor is automatic, within the page declaration where is defined the cascade motor ref added (a.c. or d.c.).

Cartiera Verde Romanello has adopted this SAEL technology and implemented by IWSA since 2005 (Internet Worldwide Sael Assistance); an evolved system that works in real time wherever the operator is.



The first day production after the re-start

The wet area of the paper mill has always generated adjustment difficulties, due to the complex structure of the plant. SAEL after the reconstruction and the new supervision system, has given to the paper mill the possibility to understand the dynamics of the plant, and also through adjustments in reference speed and regulation of the drives to produce a drive system, that paid back immediately all the efforts and the investments done by the paper mill.



Old electrical cabinets revamped by the “REEBORN” – Archive images -