LAVENO PAPERMIL – THE A.CELLI WINDER DRIVE REBUILDING

AFTER FEW DAYS SPENT ON DISMOUNTING THE OLD EQUIPMENTS, THE NEW DRIVE GOT STARTED WITHIN 5 DAYS OF TESTS. TO SOLVE TECHNICAL AND PRODUCT ISSUES THE MACHINE REBUILDING WAS A MUST: FROM THE EXISTING DRIVE LOW FLEXIBILITY UT TO THE UNAVAILABILITY OF DRIVES SPARE PARTS – AFTER 10 YEARS -. THE REBUILDING HAD A TREMENDOUS IMPACT: **25% HIGHER PERFORMANCES**, WITHOUT MECHANICAL MODIFICAITONS ON EXISTING MOTORS.

SAEL... RIBO Acelli MERATI

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

It was a fantastic teamwork between **SAEL** and **INDEXA**, who managed the wiring operations from the old to the new cabinet. After a technical investigation on "how to make this machine better" – motors and flexibility wise - Mr Marco Merati and Marco Fialuro agreed to place the job to SAEL: from a better use of the existing motors up to the rideroll motors replacement (DC to AC). Despite the added devices (above 550 machine I/O) the job was successfully done. Over 27 years of experience on Paper industry and electrical rebuilding, the SAELs team did rebuild the A. Celli machine in a **very short time** by adding a new redundant **DCS WINDER-SAEL**. Beside the old Ctrl Desks and Cabinets

"MERATI" LAVENO PAPER MILL , A.CELLI WINDER, SAEL Intelligent Drive "One Platform".

rebuilding, the scope of the supply was to increase the max speed **from 1.100mt/min up to 1.500mt/min without motors changing or any electrical modification**. Actually, thanks to the algorithm inside the Drive it was possible to achieve +/- 3% accuracy of the load cell regulation).

Even the standard requires 3 working weeks; the challenge for SAEL-INDEXA was to restart the A. Celli Winder in a quick time: below the standard and respecting the Paper mill shutdown already fixed (29-Dec electrical tests and 01-Jen 3 shift production). To meet this expectation, no mistakes were allowed!

The careful analysis made by Alberto Magani – Paper Mill Tech – co-ordinated by Marco Picconi – Plant Manager – allowed to get a footprint of the existing users linked to the Winder, as much as fitting them into the new project, providing the diagnostic too.

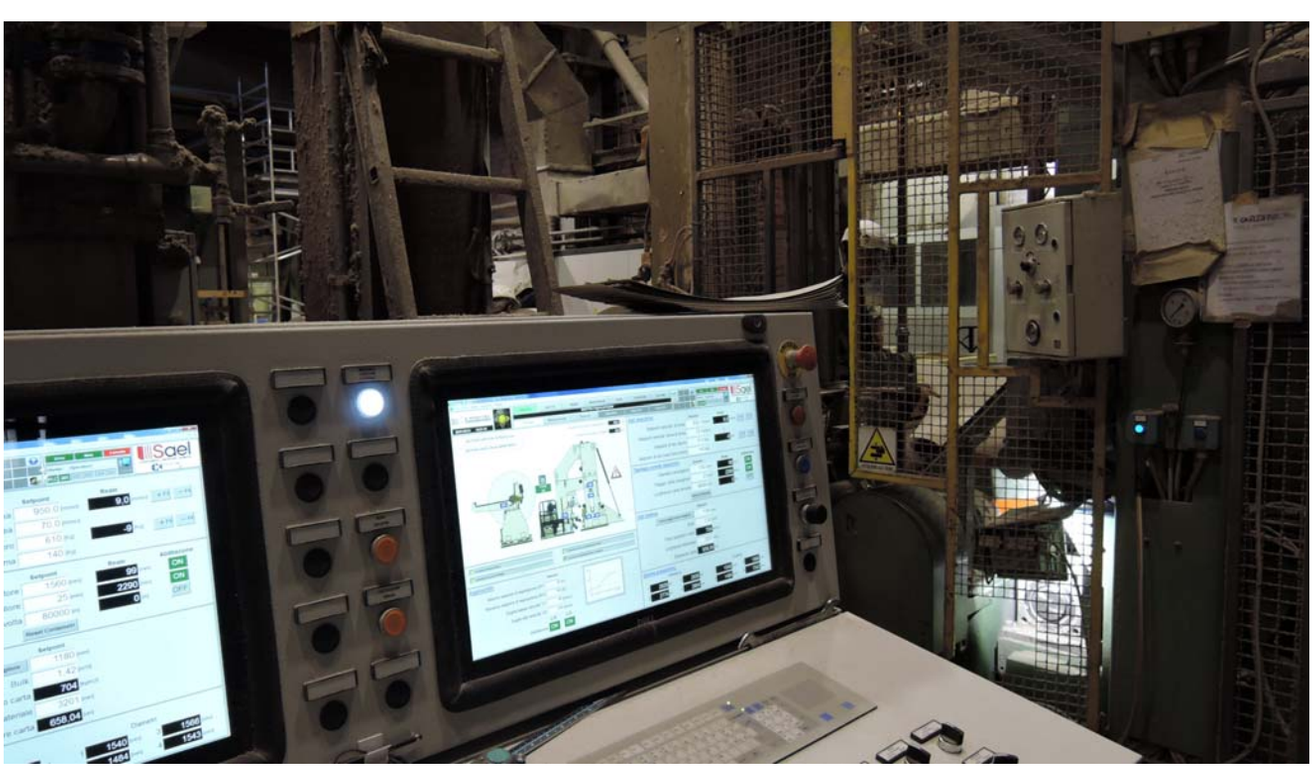
This was the successful key of the project. The plan met the expectations giving back the highest quality ever, and allowing the re-start at the max speed on time.

After the technical courses attended at SAEL, all the Paper mill techs are peers to the SAELs now, and they can set any regulation loop – Plc, SAEL Drive, System – by themselves. A great goal for the training policy of the Company. A great satisfaction for us!

The Drive renewing job involved the existing cabinet replacement by a unique big cabinet engineered and manufactured by SAEL. The original set used a big cabinet (6000x2500x1800 front end) with drives made on 2000. This one had cooling problems, components reliability problems (unavailability of the spare parts, actually). The automation was by GE-Fanuc Plc, Opto fibre SSD-Eurotherm Parker Drives (almost obsolete for the new applications): this caused many doubts on how to proceed.

The first rebuilding step was to find out the old electrical diagrams, for the Ctrl Desk and it electro mechanic mainly. Another big job was to tag and sign all the existing cables – because of lack information over the years of modifications.

To facilitate the operators the new Ctrl Desk was re-designed matching



Winder Control Desk with the Redundant DCS "WINDER SAEL" – Touch Screen Version -.

Winder Electrical Cabinet and Automation with Redundant DCS "WINDER SAEL".

the old positions as much as all the new implementations offered by the **DCS WINDER SAEL**. The main Cabinet has the same dimensions of the original one, and contains a S/PLC Vipa, four DC Drives and two inverters used to control the ride roll motors (originally DC). With few wires for Profibus-DP to the ET200, and auxiliary's supplies, everything is linked to the new Ctrl Desk. The start up sequence went as planned: dismounting of the cabinets, positioning of the new cabinet and its wiring (1st day). Remote I/O testing connected to the cabinet and Ctrl desk positioning (2nd day). Remote I/O Testing and Drives setting (3rd day). Sequences and servo diameters sets up on the fourth day. At the end of the fourth day few coils were produced. On the fifth day the machine was ready to produce at the maximum speed – 1500rpm, by 33,33 m/min/sec of acceleration. Without interfere the production, the following days were spent on babysitting activities, as well as a bunch of loading/unloading cycles.

A.Celli Winder Pic. – Laveno Paper Mill – Dec. 2014

The Winder system architecture: The architecture used is our well-known "WINDER sectional drive" which involves the S7 PLC in combination with a DCS WINDER SAEL + I.W.S.A. (Internet World Sael Assistance) on site. This allows an easy and direct machine management. The Ctrl desk with redundant PC – touch monitors – have been transformed by adding many functions to the monitor itself, removing some buttons originally used to control the machine. The screen system allows see the process,

the variables setting as well as interacting with the synoptic by the monitor. To make the interaction between PLC and supervisor happens, many utilities have been generated. Friendly user: to an easier analogical input setting. All the PLC parameters are stored and managed as a configuration file by the supervisor. Due to this approach the machine can quickly restart at every moment; moreover guiding the trouble solution. To a machine breakdown reduction time it is used the I.W.S.A. (standard from Jen-2015 on). This controls all the systems on line.

Laveno Paper Mill – 1 Cycle ervy 4 minutes

WINDER - SAEL

The "**DCS WINDER-SAEL**" is a Supervisory Station used to drive the most innovative and sophisticate winders on the market. This product has a friendly user graphic supporting drawings and tables, for the operators. Beside the machine management, this system, it is possible to set up all the Drives and the PLC. The I.W.S.A. (Internet World Sael Assistance) completes the package offering any software modification via Internet (some times the Drives can be tested via remote. Due that the Internet connection on site is mandatory).

On a different way of its competitors, the DCS winder-Sael incorporates the "historical trends fnc" of each coil: any customer before dreamt that. Actually it allows tracking each coil after many years, having all the information in a mouse click – an helpful tool for the quality certification. The real time trend is another important feature – keeping memory without time limitation (sampling speed every second).

The +25% speed production meets the Dr. Marco Merati expectations. This important goal was achieved without motors modification. Just SAEL Intelligent Drive.

WINDER SAEL; a DCS made to know all about your production.

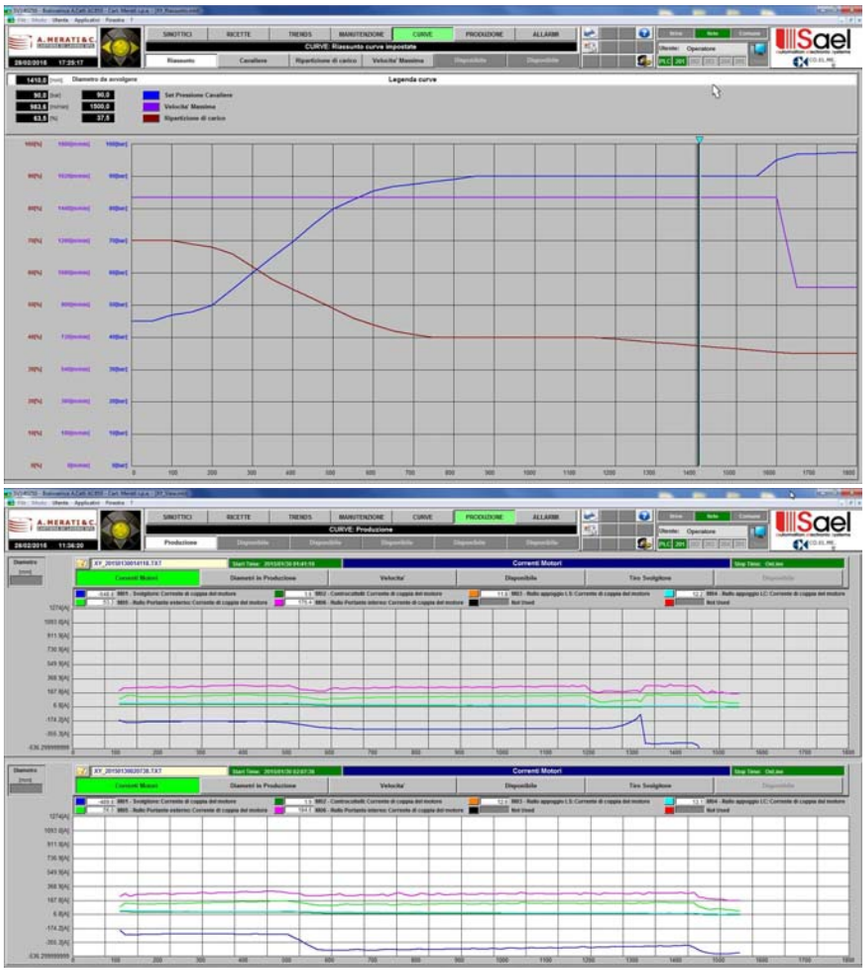
The wire dismounting, the new equipment and control desktop installing was done in a very short time. To meet the Paper Mill shutdown timing, everything was carefully studied and planed.

A good feature is the most flexible and intuitive tool to recall the original menu used for any specific coil. By a mouse click the old production menu is recalled and transferred to the new production – having the assurance of the same set up originally used.
The alarms are interesting the most. Each of them is stored into the hard disk and available with all its information at any time.
The architecture is based on Windows

7 and uses a Scalink DCS – This means the openness of the system.

The main function are:

· Motors display for each single zone;
· Bar graph / numerical information for all the electrical units;
· Alarm Continuous diagnostic with storage and archive (storage by day; by help; automatic diagram opening and films);
· Set point display and modification (eventually);
· Real time and Historical Trends storage for each coil (main units);
· Existing variable trend storage (sampling speed every second) – along the machine lifetime period;
· Tailstock, Rideroll, Speed, Pull and Rolls load share-out curves generation;
· Menu and stored working duty cycles, Curves selection and Data exchange Fnc extremely friendly user:
· Single production report;
· PLC, DCS and Drive setting engineering station – I.W.S.A. included -.



Some System pages: up side are the working programmed curves; bottom side are the 1 cycle stored curves

Laveno Paper Mill BOX:

Borne in 1954 nearby Lago Maggiore, the Paper Mill of Laveno is one of the most important recycled cardstock producer. Since 1996 the Company is investing on continuous revamping/rebuilding of the existing machines. Today the Paper Mill of Laveno is awarded as European market leader focused on cardstock tubes production. It is a full independent Company who produces green cardstock for high quality tube cardstock. 450 Tons/day are exported all over the world. Mr. Marco Merati and Marco Filauro own the Company.