



Actors: **SAEL** &

service point of Genova: **COELME** end piedmont: **SELI**

**The** BOSCO MARENGO mill is a company operating for over a hundred years in the cardboard and cartons production market for spiral pipes manufacturers, line pipes and boards for cones and angulars. With its production of 290 tons/day decided to replace its existing sectional control already in AC technology, installing **platform "ONE drive"** SAEL complete technology, advantaging of **LONG LIFE** type inverter and **"One DCS drive"** through which you can seek and manage every single issue concerning the control.

**HOW MANY TIMES DID YOU ASK YOURSELF ONE OF THOSE QUESTIONS?**

- The control is faulty, who knows how much time it will take to restart this time..
- the drive signals encoder fault, I replaced it but it still doesn't work, what will it be?
- I don't understand if the problem is in the drive, in the PLC or in the control board..
- Each time I have an unexpected fault I have to call up an engineer to fix it up and spend a bunch of money..
- It's four o'clock in the morning and I should substitute the drive, but I'm afraid to cause other problems..
- Let's try changing card, will I remember all the parameters?
- I changed the drive but it doesn't work like the one before, did I make some mistake in the parameters?
- Now that I can't start again, calling for

**SAEL** s.r.l.  
 plataform "ONE"  
 in Bosco Marengo  
 Paper Mill

assistance will I receive a fast reply?  
 -I don't remember what we did last time we encountered the same problem, how did we solve it to start up again?  
 -I must spend a lot of money in spare parts, the control is now over four years old..  
 To solve those doubts and reply those questions SAEL launched in 2011 the new platform "ONE drive" exclusively for paper mills, each one of our drives (AC, DC, BRUSHLESS, CHOPPER E REBORN) for continuous machine, reeler, calander, wrapping machine and dough preparing up to system control cards is managed by a hardware exactly identical "ONE" card. The "ONE" card holds a ductile memory containing all relevant data, which is extractable and easily replaceble by anyone, even with no experience. No programming, parameter setting or operation normally prerogative of engineers world is practically necessary and no need for a PC to restart one of our drives after a failure.  
 A simple system equipped with self

diagnostic tools to help the mill in conduction with no equal failure seeking. Platform "ONE drive" features use of very last generation LONG LIFE drives, with practically infinite lifetime. Our drives have been designed using components that don't fear aging (for example all electrolytic capacitors with 50.000/70.000 hours of work time have been replaced with film type capacitors). They are designed to be easily repairable opposite to our direct competitors, producing in series in the consumer tendency house appliances are made; in case of failure they must generally be completely replaced. Model changes even after few years from placing on the market is always lurking; another nice brainwave to confuse customers and force them to update their spare parts stock. Remote control and possibility to seek every problem happened to the control through "DCS in drive ONE" completes our platform that, over making you save money on spare parts, grantes long system life and easy component replacing. This is the philosophy

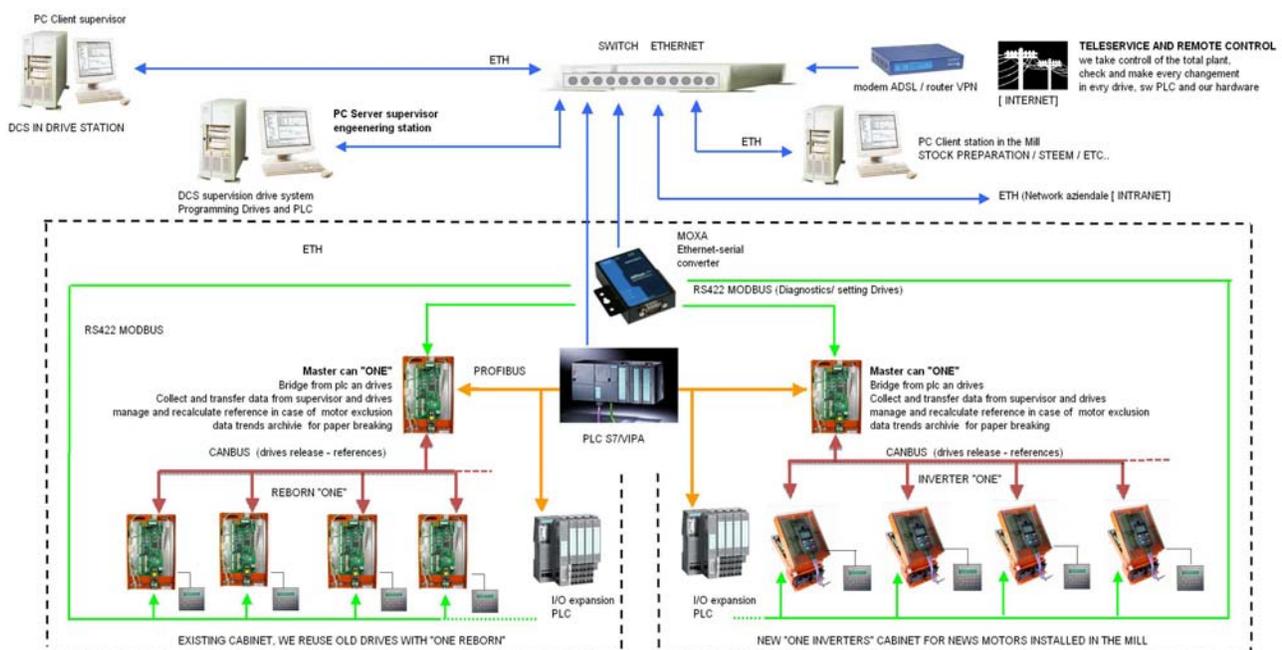
with which SAEL “ONE platform” replies to paper mill drive requests in 2012. Bosco Marengo PM2 control is the clearest example of what above said. It showed components aging problems (even after only six years in some cases), market spares availability problems (components out of production), and to frequent machine stops that, especially in these last days, no paper mill can afford. The paper mill owners Stefano and Alberto Ghigliotti with the technical manager Mr. Vigo in close collaboration with SAEL, developed a renewing plan for MC2, flexible, ergonomic and low cost, replacing all existing Ansaldo inverters with SAEL “ONE drive” platform keeping both existing DC-BUS hardware updated with “ONE REBORN” control card end all existing electric boards. Another very important improvement came from putting in safety condition of the whole plant. Possibility to switch off in safety mode every single inverter. It is now possible to cut out a drive from the DC-BUS and put it back to work with no need to stop the other motors and the DC-Bus itself (very important feature in presence of big drying units that could create condensation). Sectioning of each inverter in complete safety, can be made also from the control pulpit via a lockable selector. All these features were impossible to be implemented

with previous system. For this reason and due to the fact that on the European market SAEL builds drives granting a minimum life cycle over 12/15 years (differently from multinational companies that got the market to be used to very frequent products radical changes even in 3 to 10 years). In Bosco Marengo they married SAEL proposal and started the job, now completed on MC2. “Is to be underlined - says Paolo Andrighetti, commercial responsible of SAEL paper field - that for each buy order, we offer to more than one paper mill technician to follow courses on the systems installed in the mill. This makes the partnership even stronger, and allows to have qualified internal skilled personnel for the start up and able to keep the plant to its maximum performance level. No other company operating in the industrial automation field works on training and shares information with its customers so widely and opened”. SAEL effort in engineering and develop better products prevents its customers from the side effects of continuous and sudden product change, that makes relatively young devices to be obsolete very quickly. The electronic automation and drives market as the PC and consumer electric product market is in fast an continuous evolution. Companies that produce and sell drives all over the world are forced to continuously develop cheaper

products to compete with their competitors on a price struggle so heavily penalizing their customers who find their drives out of production in a few years. “Our international competitors in system engineering, even unwillingly - says Paolo Andrighetti - are obliged to comply with that rule. SAEL instead always stands for engineering its drives intended to be used as components of a complete system rather than be sold as single units. This allows us to pursue and attain long products lifetime as one of our primary goals”. Another particular feature of SAEL Intelligent AC and DC DRIVES is their components reparability. This last aspect makes a big difference comparing to commercial drive builders, who require complete product substitution in case of minor failure, allowing big savings in the spare parts expense.

### SAEL’s “One Drive” platform

The new **technology platform “One Drive”** installed in paper mill, is the real revolution in the drive market. Completely reversing market tendency, SAEL from year 2011 uses only one control card for all of their drives, no matter if DC, AC, Chopper, Brushless or Reborn, and also for the reference cascade. The company also



**SAEL “ONE” PLATFORM SYSTEM, EXPRESSLY DESIGNED TO MEET PAPER MILL NEEDS**  
**The bloc diagram shows how we can recover old existing drives with only “ONE” card**  
**Any motor adding is made through new LONG LIFE drives, made to be as long-lived as possible**

ensures card replacing in only 3 minutes, having provided “ONE” with a ductile memory containing all setting and parameter data, extractable and easily replaceable by anyone, even non skilled on drives maintenance. In practice, no programming, parameter setting or operation normally prerogative of engineers is necessary and there is no need for a PC to restart one of our drives in the unlikely event of a card replacement. Inverters of “SAEL One” series, designed with an eye on the paper mill needs, have been provided with film type capacitors in place of electrolytic capacitors with 50.000/70.000 hours of expectable work time. So SAEL inverters lifetime is practically infinite not having aging components installed.

Some highlights from the job performed in Bosco Marengo paper mill: 1.5MW is the motor power distributed on 17 inverters that compose the MC2 control; inverters have been standardized to have only 2 hardware sizes allowing to greatly reduce spare parts number; complete spares for PLC and inverters have been provided to grant zero time restart in case of failure; 1 is the number of spare cards control card “ONE” needed, for all the drives mount the same control and even technology cards like MASTERCAN are developed on the same HW since 2011; 2 are the DCS supervisory stations for plant control and supervision, installing powerful software tools allowing to follow every single operation performed by the operators in case of break; 17 are

the operator panels (in redundancy with DCS) allowing to control each motor and display its status, giving possibility in case of DCS crash, to perform all actions necessary to the machine conduction operators.

The plant start up involved as protagonists all the paper mill technicians together with our Piemonte “service point” “SELI” form Cuneo. The paper mill staff performed all the inverter wiring inside cabinets - having eliminated the ones previously installed - the laying of all communication networks

for our Digital Operator Panels, the two PC/DCS supervision networks - diagnostic and engineering station - the master PLC of all emergency chains to comply with safety standards and the electro-mechanics to disconnect single inverters under load and relevant reconnection with line start-up circuit on the DC-BUS.

To accelerate job execution time to be performed during the plant stop, every single component was pre-wired on steel boards designed to be installed in the control boards. “We were able with this



solution - adds Andrighetti - to speed up device wiring to record time. A well trained team was so formed, very motivated, managed by our job manager Damiano Longo and the paper mill electric department manager Mr. Barocelli involving everyone in the many tasks to be carried out.

At the fixed date, May 30 2012, every single component and planned task to be performed before the stop was perfectly tested and ready to be inserted in the into the existing electric boards. After three days of wiring we were able to move the first



**BOSCO MARENGO HUMID ZONE; IN ONLY 7 DAYS THE AUTOMATION WAS RENWED WITH “Platform ONE”**

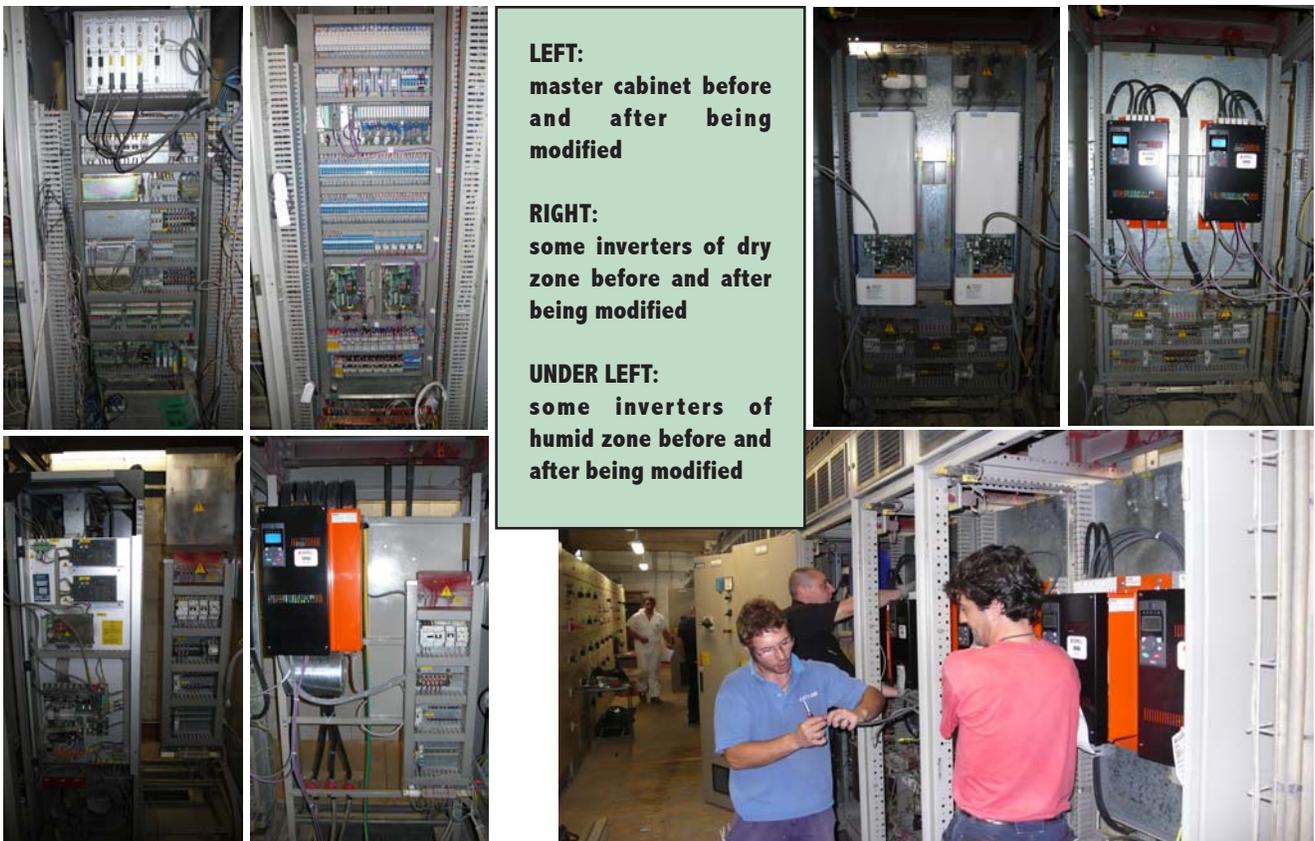


**ALL MATERIALS FORMING THE CHANGE WERE CAREFULLY PREPARED AND PRE-WIRED BEFORE STOPPING SO AS TO REDUCE DOWNTIME MACHINE.**

motors and after only one week the plant was already producing at the maximum running speed with the specific paper for the pope. To be of strategic importance were the tasks implemented by paper mill staff on each alarm and run consent inserted in the "alarm help" tool of the "DCS DRIVE". This

last is a very useful function through which you can store and edit, for each alarm, all related components and operations to be performed to fix the fault. In this way is possible to lead less skilled personnel to quickly solve any problem on the plant. By a mouse click on the alarm maintenance staff is given access to the relevant electric

diagram in the exact point where the circuit breaker, proximity, contact, encoder or whatever is and is also given possibility to display a video record (produced with any video recorder device be it a camera or a cell phone) to bring even less skilled personnel to know what to check, reset or replace to solve the fault. This function is



**LEFT:**  
master cabinet before and after being modified

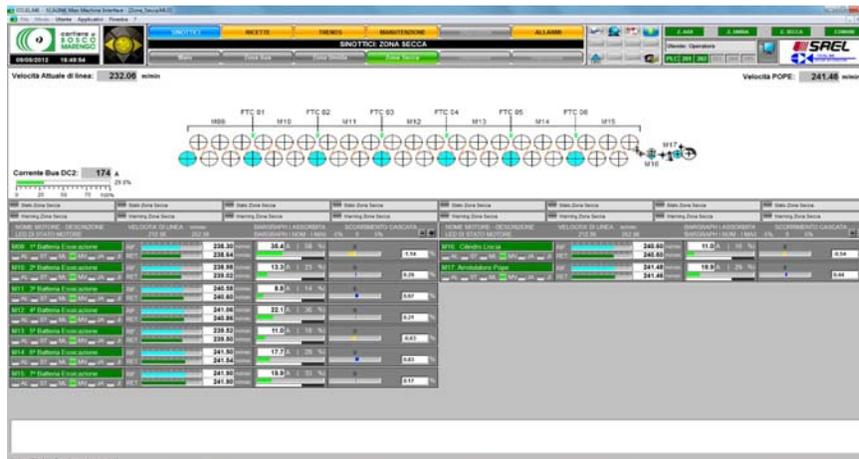
**RIGHT:**  
some inverters of dry zone before and after being modified

**UNDER LEFT:**  
some inverters of humid zone before and after being modified

**electric wiring operations took only two days**

by now at the third generation and features in plants where many efficiency points increase was measured. Guiding maintenance staff by means of texts, snapshots, video and automatic schematic page opening, it becomes very easy and fast to seek for faults giving a pointed and precise indication of where to intervene in case of failure.

Another peculiar feature installed and tested on this plant was to insert the "MAIL" function for the alarms eventually extendable to "SMS alert". This means that every anomaly detected in the system data, over been displayed and recorded in trends, is emailed or sent via SMS to paper mill emergency technicians, so as to activate them in very strict time to seek for an eventual failure or fault. From anywhere around the world, the emergency maintenance personnel can connect via the Internet with the plant, using the function



**The powerful "ONE DCS in DRIVE" control system, now features more efficient tools to seek every system operator problem. For every fault we grant very fast restart with failure analysis records.**

"Lite Time Client" (default feature on our DCS) coordinating restart procedures and having all the plant data in his hands. That's because all operations and displays

available on the two PC controlling the plant in the paper mill, are available also to any PC external to the paper mill connected via the Internet for up to two hours maximum time.



**Electric cabinets before and after Ansaldo inverters substitution with our "Platform SAEL" LONG LIFE type, to be noted the considerable dimension reduction due to very last generation components, it allows hi inverter performance and energy costs cutting.**

In recent years SAEL continuous growth covered the increasing number of applications changing its structure to meet the right technologic attitude to value the hi technology level of this plants. "Research brought us to compare and overcome main European electronic engineering companies that historically used to represent a standard as electronic automation dealers in this field - adds Paolo Andrighetti - using mainly market PLC combined to proprietary "ONE Drive" devices. A very simple architecture that does not need dedicated proprietary HW, granting simple realization and few spare parts needs being, apart from the drives, all common marketplace devices. Research over components has always been the key in every system we designed. Through to the experience developed in many previous jobs carried on and thanks to the policy pointed on proprietary research over drives, we moved great part of the control and technology functions inside the drives system". "ONE Drives" offer infinite possibilities for those who develop e realize paper machines. Inside their software you can find many configurable math functions through which you are able to make every adjustment normally needed in the paper field automation. Furthermore the new



**BOSCO MARENGO PAPER MILL POPE ZONE, "Platform ONE"**



**POPE CONTROL ZONE modified with our new Digital Operator Panel (with no resident software so equal for all motors)**

"AZRUNNER" software allows a simple approach to the drive. By means of this tool, possibility is given to link the various available math blocks to perform automatic process regulations needed and you can configure on-board digital and analog I/O to control system variables.

Month after month, year after year, our drives be it an inverter or a DC drive, bring on-board all SAEL know-how. The "DCS in drive Scalink" supervision and programming system, developed together with our service point in Genova COELME, featuring in this plant, provides a powerful work and plant control instrument, giving machine operators easy and immediate management over all tasks involved in the machine control letting them intervene on the process in an easy and immediate way. Growing over time and capitalizing on the experience made, we reached a high management level and now the system includes also the Engineering Station option allowing PLC and Drives programming. Furthermore IWSA "Internet World Sael Assistance" allows to remote manage the plant in "real-time" in any of its parts from anywhere in the world an engineer decides to intervene. From this remote control station you are given possibility to manage drives and control cards parameters, Develop and modify PLC SW and remote control all plant variables.

**"Platform ONE"**  
**created for paper mills and intended to the end customer**