

RECORD PRODUCTION IN MACEDONIAN PAPER MILLS THESSALONIKI, GREECE



IS REACHED AFTER THE REBUILDING OF THE OLD EXISTING DRIVE SYSTEM, AND THE ADDITION OF A NEW SHOE PRESS, WITH OUR “PLATFORM ONE DRIVE” AND DCS SCALINK. THE PROJECT STARTED IN THE MIDDLE OF JULY AND AFTER ONE WEEK OF ADJUSTMENTS, THE MAXIMUM HISTORICAL PRODUCTION BECAME TRUE!

SAEL s.r.l.... MEL Grece

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

The rebuilding of the paper machine drive system of paper mill MEL- part of Turkish PAK Group, including one series of new AC and DC electrical cabinets with DCS and the automation of a shoe press in collaboration with Voith-Spain, was successfully completed. We have replaced and old-obsolete and low maintenance drive system, by maintaining the DC dry zone motors, and placing new AC motors in the wet zone and the new press section. The paper mills vast renovation-upgrade, which was strongly desired and supported from CEO Efthimis Nalmpanis and the paper mill Manager Giorgos Georgiadis, involved almost all the paper machine

BOX MEL

The history on paper

The history of the MACEDONIAN PAPER MILLS began in 1964 when it was founded by Georgios Ladopoulos. In 1967, the plant and management were transferred to Northern Greece, where the company continued to grow. With its trust of technology and expertise, the company prospered at its new location. The role of the company in the economy of the wider area and its contribution to carton board production in Greece were both significant. In 1984, MEL came under the Business Reconstruction Organization, and was privatized in 1998. MEL has been a member of the Pak Group since March 2012. The history of the Pak Group dates back to 1923. Today, the Pak Group consists of 19 companies and specializes in four areas: Foods, flexible packaging, carton board and real estate. Total gross turnover for the Pak Group is more than \$500 million, and it employs about 1,650 people. The Pak Group owns 75% of Kartonsan, the largest carton board producer in Turkey, and 70% of Intermat, the leading manufacturer of flexible packaging in Europe. With the addition of Macedonian Paper Mills, the Pak Group has become the fourth largest carton board manufacturer in Europe, with a total production of 340,000 tons.

The plant

The main offices and plant are located in the Thessaloniki Industrial park, the first private industrial park in Greece, at the 22nd km of the Thessaloniki-Edessa National Road. MEL is in a key location with convenient access from all points in Thessaloniki and Macedonia Airport, making easily reachable from anywhere. It is located on privately owned land of 230,000 m², with a plant of 30,000m² and 190 specialized employees. More than 100,000 tons of coated printing carton board intended for general and food packaging uses are produced here. The majority of our production is exported to demanding markets in Western Europe and countries in Africa and Asia.



parts, in which radical changes have been made in the entire Press section and drying section, tail screening and reject handling, new guide rope, complete paper machine Drive System with DCS Scalink, steam and condensate system modification, new vacuum pump system upgrade including 4 new vacuum pumps, installation of a new pulping line in the stock preparation system and the modification-upgrade of another two lines including automation, also was installed a new automation for coating kitchen, new machine hall ventilation system, new roofs and new crain with 3 hooks 30 tons plus 2X15 tons. The total investments exceeded the amount of 12.000.000 Euros.

Above to that MEL acting in advance and with the new increased capacity now in hand, has ordered a new sheeter from Milltex to be delivered in Early 2018 and is prepared to move to more actions next year in order to increase their productivity.

Some numbers about the project:

2MW installed Power only for the 38 paper machine motors and 17 new motors for stock prep, 3,6 meters paper machine width, daily production now reaching at 400 tons/day, maximum speed 210m/min- target for the next upgrade 400m/min, more than 300 people involved in all mechanical electrical, construction



The mill under reconstruction

works, including MEL personnel, in around 3 weeks of works. The paper produced from the machine, serves the needs of customers in Europe, North Africa andIt is estimated that more than 3,4 million boxes are produced every day, using paper produced in MEL. The record-breaking production speed of 210 meters, was a rapid reward for the enormous investment done by the paper mill both in personnel and resources, during this upgrade. The production goals in terms of speed and efficiency, and the increase of quality of the product, which was the principal reason for the investments, surpassed the

expectations, receiving big satisfaction from the positive feedback from their customers.

Returning to the project supplied by SAEL, the predominant and technological part of the system was the supply of DC / AC cabinets for the control of the paper machine. The AC cabinets were powered by a new specifically dedicated transformer, in order to prevent the interference between the Inverters to the DC drive. According to our standards, the inverters are equipped with film capasitors instead of electrolytical ones, to guarantee an infinite lifetime of the product. The regulation cards



MEL Macedonian Paper Mill view of the production plant, Salonicco Grecia.



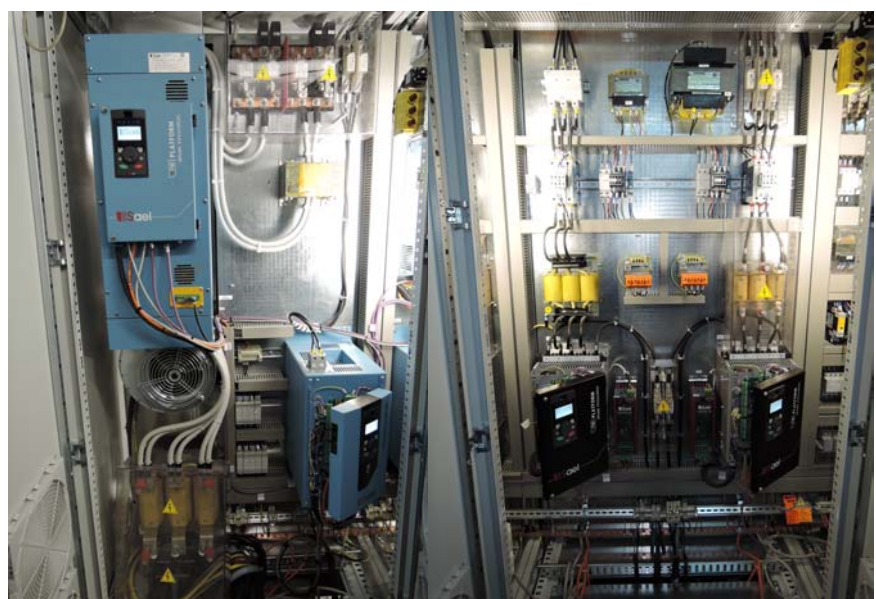
MEL papermill, Drive and automation room during commissioning

“ONE” are exactly the same used for both DC and AC drives; with PLATFORM ONE drives also MEL will have the possibility having only one electronic card spare part. The realization, under the customer’s request, has been engineered with two separate panels for the AC and DC sections. The cascade of references was made with the “SAEL SECTIONAL DRIVE”. The only existing system based on the use of the intelligent SAEL drive without the use a cascading manager. A direct communication between the drive (without distinction between them, even though there are different DC-AC origins), carried out by a build in CAN-BUS communication with which every drive is connected, ensuring a high Cascade refresh speed between the drives and the electrical shaft of the sections. The Can-Bus used is actually a Multimaster and not a master-slave system many of our other competitors use; this protocol allows us to fully manage every single communication.

In our programming and supervision tools, we are able to control all the packets transmitted by each drive, including infinite historical trends over time, for each communication, and for all network participants. Any

transmission or defective network or drive failure is memorized and stored in such a way that it is possible to control, over time, successfully if it was a failure or drive malfunction. Changes were also made to bring safety equipment into compliance with current regulations. The management of each sequence has been delegated to two S7 PLCs, one for the drives and one for the Shoe Press. All the machine control desks were also rebuilt with the installation of our “DOP” -digital operator panels - one for each motor, which guarantee the

redundancy of the control together with the 5 DCS stations, scattered in the plant. The DCS Scalink , realized in redundancy mode, which also manages the control of the Shoe Press, without tags limits being virtually infinite, memorizes every second all the parameters of the system without time limit. With this platform now the paper mill will be able to extend its control also to other PLC’s and memorize variables infinitely. The ‘DCS in Drive’ which is included inside the DCS, is an unmatched drive and management control system; allowing to memorize and display any trend, machine status and variables existing and managed by our drives. An real engineering station from which, in addition to driving the system, it also has its full control by programming and parameterising each single drive, existing hw and PLC connected to it. The DCS, drives and DOP operator panels positioned along the machine and inserted into the control desks have the Plug and Play function. Practically for their replacement in case of failure, no programming of the panel is necessary, it is the same instrument that once inserted into the desk, performs a download of the necessary sw from the “ONE” card that is assigned the display of the motor, and Reprogramming exactly



Left: Inverter cabinet double side for wet area Right: DC drive for dry area

as initially set. Immediately the customer, previously lacking this control, was able to understand the depth in which this engineering station can store all that is going on inside SAEL cabinets, memorizing also any single action that the operators do in the paper mill and the electrical mechanicals change in the system. Finally IWSA "internet World Sael Assistance", permits us to teleassist the paper mill in real time directly from any part of the world, where our technician can interfere. In practice from this control station is possible to parameterise the drive and the electronic card SAEL, develop or modify SW PLC and remotely control the entire system. In these years of growth SAEL has always been able to hold pace with numerous applications always finding the right solutions to value the high technology content of these plants. Our investment in research and the combination of standard PLC's with our "PLATFORM ONE", has enabled us to keep pace with the more famous electronic companies whose components had historically been standard equipment for designers of European machines. Our architecture is extremely simple, and does not require dedicated or custom hardware, leading to design simplicity and readily available spare



THE NEW PRESS SECTION MODIFY IN MEL PAPERMILL

parts. Apart from the drives, all the materials used are standard off the shelf products. SAEL's research into products has always been the point of strength in the systems built. Thanks to numerous applications and the policy of doing research on drives, we have implemented the technological and control algorithms inside the drives. The motor-controllers of the series "PLATFORM ONE" today offer a vast number of possibilities to designers and builders of paper mill machines. Their software

contains various mathematical blocks, which can be configured to compose all the control modes and algorithms, that are usually used in the paper industry. A powerful and new software "AZRUNNER", makes the approach towards the drives simple. Connections between various control blocks used for the production process are done with this tool. It also configures the drive's digital and analogue I/O's and can enable control algorithms. Year after year and month after month the drives, either inverters



MEL cabinet room, combined with double side mounted drive to reduce the space.



Complete AC double side cabinet - to reduce space- in SAEL workshop, Platform ONE guarantee film capacitors instead electrolitical - no end life components.

or DC-converters, integrate the whole of SAEL's know how. Also on these premises in MEL, Greece, we insisted in the training of the mill's personnel, not just to manage the drives, but to fully use them. Today in the paper mill our drives are components for normal everyday usage in various type of machines, be it a single motor or a complete paper machine. Making the paper mill personnel able to get

actively involved, through training courses and by giving them up to date programming tools lead to a synergy that got stronger time after time rendering the mill's technicians independent even when making small changes in the system. The integration of tele-assistance and tele-control tool (SAEL I.W.S.A.), overcomes the problems of distance, and guarantees rapid

problem-solving and technical assistance at all levels. It is because of all these characteristics, that a group like Sael, is considered reliable even by a primary company like "PAK GROUP", which is awarding Sael with ever more important and strategic supply orders, in their plants that need revisioning and modernizing.

