



RELIABILITY SPARE PARTS PRODUCTIVITY

Here we are. The three main points who pushed FAVINI to revamp the drive and the automation of its JAGEMBERG Sheeter. The machine who centres the whole production of Rossano Veneto Paper Mill Plant.

SAEL s.r.l. Papermill FAVINI

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The Jagemberg Syncro Speed 350-1650 DD automation control revamping has been approved by Favini's management because of reliability and spare parts availability issues

as much as to upgrade productivity and efficiency. To meet the costs reduction and new technology upgrades - within a good status of the original equipment - SAEL maintained

the original wirings and links.

The main sheeter control revamp was the first step - actually this is the core of the machine -. This was done by changing the draw roll DC



The Jagemberg sheeter subject of the SAEL revamping: Total atomization and DC motors replacements with AC low inertia motors - SAEL "PLATFORM ONE DRIVE".

“PLATFORM ONE”

The new Paper Mill LONG LIFE Inverter series



motors and the two knife with AC Vectorial Motors and Drives.

The obsolete Micromatik drive used for the old DC Sheeter group has been replaced by a new SAEL Inverter equipment within the consolidated “Standard Synchro-electro” configuration, combined with a VIPA PLC.

The “Platform ONE Drive” architecture and the S7 PLC allowed the full control of the machine cutting the old boards and electronic components as well. Every regulation, sequence, management algorithm, calculation, breaking control was obtained by the interaction of the ONE DRIVES SAEL with the Siemens PLC. The single DC drive used to control the two motors had been replaced by two inverters - Master-Slave config (one each

motor). This solution achieved a double goal: better performance and no stop machine in case of a single motor fault - the machine can run up 70% of the full speed with one motor .-

Main features:
(ex Micromatik e S5)

- Management of the new AC main motor – draw roll - and machine speed control
- Management of the new AC knife motors with profile optimized based on the sizing
- Management of the new AC belts motor for sheets extraction
- Management of the existing overlapping belt AC motor
- Stacker hydraulic moving management
- Cutting sizes management



Jagemberg DQA electrical cabinet sections and knife control before the revamping: All the electronic board were replaced as much as the S5 PLC with a S7 PLC. The Micromatik motor drives and knives were replaced by a new electrical equipment with AC inverter - substitution of the old DC management driven by a Micromatik micro processor.



The main control Desk drive rebuilt and simplified to a more ergonomic and modern management. The control Desk possesses a touch screen video-keyboard.

** joints or defects detection with program of the scrap length before and after the defect
 ** Deflector Drive spacing requirement
 - Synchro aspiration existing DC motor control and automatic compensations according to the sizing, the speed, the synchronization

- Alarms and speed visualization
- Interfacing to the existing network

(ex DQA)

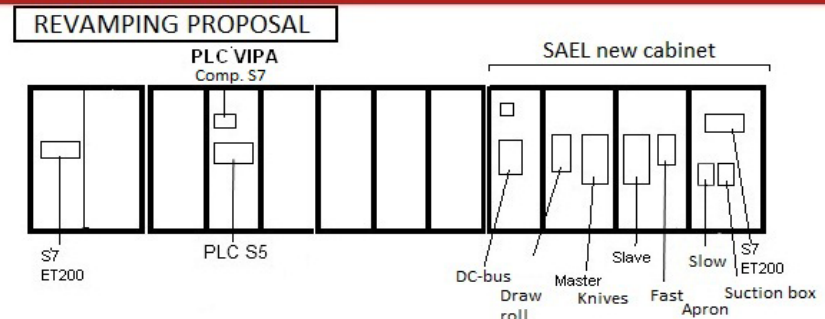
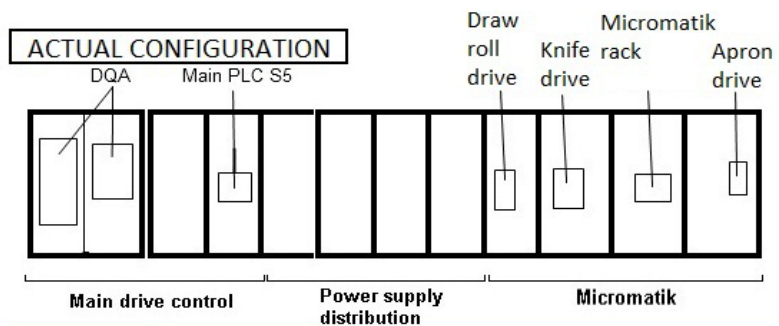
- Sheets counting and ream

- Nr of drums automatic detection
- Slow transport belt brake-friction management
- Belts emptying management
- Sheet rejector syncro management for:
 ** manual call by the operator

- photocell positioning, the mechanical time losses
- Sheets counting and pre-selection management for the pallet changes and ream control
- Automatic pallet changing sequences to the sheets counting



Jagenberg Syncro Speed 350-1650



The existing electrical equipments were saved and modified with a S7 PLC. The old BBC DC drives and the Micromatik cutting system were replaced by a new equipment - see above -.



Sheeter electrical equipment after the taking place of the new AC equipment vs. the old Jagemberg cabinet

preset achievement with “Stop/No-Stop” and “with/without scrap” option

- Management of the moving auxiliary functions and blows
- Supervisor system implementation on a Panel or a PC with standard operating system and S7 PLC project integration

(ex PLC S5)

- Rectifier AC Auxiliary motors, hydraulic pumps and blowers management
- Hydraulic and Pneumatic valves management

The new hardware and software solution increased the performance in term of accuracy and scrap limitation achieving the

best result ever - voice of the Favini’s team -. The new system provides all the safety functions required: speed limitation based to the sizing; maximum knife turns speed control. Avoid any mechanical stress to the machine the maximum speed has been settled accordingly - 300 m/1' - as much as the sizing range availability.

Before the Stop a careful check was done to any actuator, sensor and device connected to the equipment. The engineering of the new equipment respected the former configuration. Accordingly to the SAEL policy the revamping involves a machine performance increase.

A focused investigation to the cutting drive group allowed to point out the weaknesses of the system offering the best solution to meet the customer expectations. The safety devices have been updated as well.



Jagemberg cutting Unwinders view



View of the new electrical equipments with ONE Inverters who replaced the old DC drives ; the knife electronic management is made by the ONE board within the SAEL drive. Out of the "PLATFORM ONE" drives no other hardware or electronic boards were used.

The coils automatic braking system was totally renewed. Each coil has an own pressure device driven by a remote unit on line with a

Profibus DP on board machine. This is a multiple value selling solution vs. the original one, such as:

- Independent coil pull management for twists or different material usage compensation;
- Diameter programming to stop



Despite starting sceptical caused by short time availability, the customer's technical team - Eng. Vettese and Zurlo - were fully satisfied of the achievements.



The STOP AIR motor management and the knife - in DC before - have been replaced by equivalent AC motors driven by ONE DRIVE inverters. The Favini's team made the mechanical replacement by them selves.

the machine at any point;

- Nr. of coils automatic detection with braking and sheets counting adjustment;
- Over-brake management - thanks to the coil inertia calculation who allows to stop the machine without faults or material loosen, as much as a prompt restart -;
- Old pneumatic circuits cut off.

An important innovation was offered to the cutting drive management. Some improvements achieved more accuracy at lower speed - never got before - New sophisticated sequences as much as automatic

pallet changing got a dramatic scrap reduction. A friendly user interface on a touch-screen panel allows a quick and intuitive data exchange as much as a production changing with focused actions to be done by the operator. Thanks to a full automated machine management the "ad-hoc" software prevents any fault at normal machine use. This is a plus for the operators who can be concentrated on other priorities like quality controls. Every function who requires a synchronization with the sheets flow was made via

hardware - within independency of machine running and duty cycle timing computed by the PLC -. The Favini's production and operators team showed a full happiness to the SAEL goals. Speed and production increase; loosing time reduction; jamming reduction; quality increase by a new accurate cutting system and a better braking system; hardware and software safety tools; easy faults detection by a sophisticated diagnostic system; simplified hardware architecture; easy software to a quick maintenance.

