

3Q TECHNOLOGY  
SUCCESS STORY  
RIVA THY  
MARCINELLE



DANIELI AUTOMATION







## THE CUSTOMER

Riva Group is Italy's largest steel producer and the fourth biggest player in the European steel industry. Founded in 1954, the group has specialized in the manufacturing of long products using electric arc steelworks, achieving an international leadership in the main European countries, thanks to high production standards and to a focused and steady strategy of growth and investments. It has 21 industrial plants located

in the following countries: five in Italy, seven in France, five in Germany, two in Belgium, one in Spain and one in Canada. Riva Group supplies different product areas, some of which, for example mechanics engineering, automotive and earth-moving machines, demand especially high quality standards. Production includes drawn, peeled and ground steel items derived from further cold-rolling processing.

Riva Thy Marcinelle steelmaking plant is located in Charleroi, Belgium, and it consists of:

- > 160-t electric arc furnace;
- > ladle furnace;
- > eight-strand continuous caster for billets;
- > pusher-type reheating furnace;
- > a two-strand bar and wire rod mill for reinforced concrete;
- > Cold rolling and straightening for concrete-reinforcing rounds.

The vision of the Riva Group and the solutions developed by Danieli Automation are come together at the Thy Marcinelle plant. This system upgrade paves the way to a new concept of control for the steel industry, for improved plant performances and reduced dependence on the skill of operators. This concept has led to develop a new generation of operator interface and pulpit design, to make operators work more safely,

efficiently, and easily. This pulpit matches very well the requests from the Riva Group. At the Thy Marcinelle plant Danieli Automation has won the opportunity to create a unique and revolutionary workspace where the operators don't see the plant through windows, but rather watch huge screens and apply a new system approach. The Knowledge-Based Approach consists of showing the operator only the useful information

required for that precise process step. The operators have the ability to work on different plant areas from one single pulpit, safely and quickly. They direct every machine as required by the process and with the control system driving them to the right action in the right time, whereas traditional plants depend mostly on the operator's skill to choose the sequences and process steps.

## THE CHALLENGE

THE SOLUTION

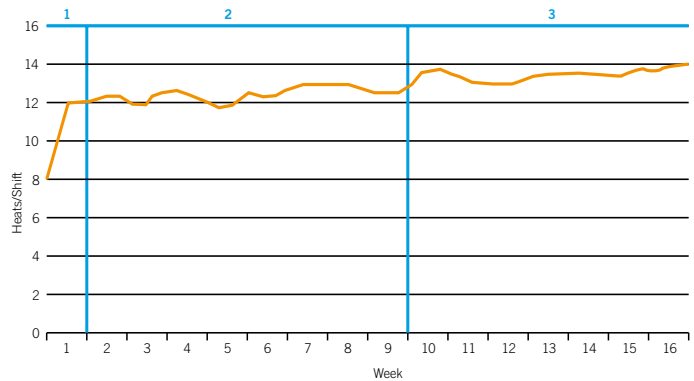


The solution adopted by Riva Thy Marcinelle with Danieli Automation is to unify and integrate the control pulpit of the EAF with the one of the LF. The new control station is defined by a room without windows, in order to control two different technological processes. The pulpit has two workspaces, one for each furnace, where one operator commands one machine set. This new pulpit is divided into two parts: every operator looks at two big screens, one for the CCTV (Closed Circuit Television) and the other for the API (Area Performance Indicator). The pulpit control desks are equipped

with a minimal number of pushbuttons and controls, thanks to the new Operator Assistant.

The new 3Q automation control pulpit is composed of:  
 > **OA Operator Assistant** Instead of working on a panel with many pushbuttons, the OA is a multi-touch display interface with a knowledge-based approach, that advises about the situation of the plant, any problem or difficulty and, most important, suggests the right sequence of actions to obtain the expected result. The Auto-Pilot and the advanced messaging system guide the operator throughout all melting and refining phases.

> **API Area Performance Indicator** The API function provides, for each technological area, overall information on the status of the process in the controlled area. It receives and translates information into a graphical overview presented to the operators in the simplest and direct way;  
 > **PPI Plant Performance Indicator** The PPI function provides overall information on the status of the processes in the controlled areas. As for the API, the PPI receives information from the EAF/LF and translates that information into a graphical overview for a quick recognition of critical process status;



Number of heats per shift during three-stages commissioning



## THE BENEFITS

> **OWS Operator WorkStation** the basic interface between operators and Process Control Automation;  
 > **CCTV Close Circuit Television** for a real and direct vision of the plant, without unnecessary risks for the operators.

The additional goal of this project was to increase the plant's output by reaching 14 heats during each 12-hour shift. The commissioning phase was divided into three stages:

> **The first stage**, the startup time, during which only five days were needed to reach 12 heats/shift (before the update intervention, the average production per shift was 12.37;

> **The second stage**, the adjustment period, lasted about two months; the record shows a fast stabilization of production at 12 casts/shift, as well as a fast and deep improvement of the operators' knowledge of the new system;

> **The third and last stage**, the improvement phase. During this period, up to scheduled shut-down period for maintenance, it was possible to achieve the target rate of 14 heats/shift.



Both Riva Thy Marcinelle and Danieli Automation are well satisfied with the results of the revamping. The new system had sensibly decreased the unscheduled delays during production, and therefore the power-off of the furnace has been reduced. The Auto-Pilot and the advanced messaging system guide the operator throughout all melting and refining phases.

While in the past the production of 14 heats was very difficult to achieve, after revamping and with the same loading charge it is possible to complete the 14th heat before the end of the shift. The result was obtained without mechanical or process interventions but only by power-off decrease, thanks to average delay reduction per heats. This phenomenon is realized by the good effect of the launch of all the functionalities of the Autopilot system, along with the



huge introduction of overlapping cycles, in the reduction of overall delays caused by automation.

Moreover, the enhanced reporting system allows the meltshop department manager to control each day's results and

to tune the process to increase the level of production. Riva Thy Marcinelle recognized that over a long period there are margins to achieve even better performances, and expressed its appreciation to Danieli Automation for a job well done.

## THE FUTURE



As a confirmation of this successful operation, Riva Thy Marcinelle awarded Danieli Automation for the revamping of Process Control Automation of the 8-strands CCM billet caster, with the target to extend and harmonize the same 3Q Automation to all the plant.



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