

**SYMPOSIUM 1 - BBS, A CONTINUOUS PROCESS
HOW TO ADAPT AND TO MAINTAIN IT (27TH JUNE)**

Baltimore Aircoil: A successful integration of OBM and B-BS into Lean Manufacturing environment

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ABSTRACT

Baltimore Aircoil started in 2006 a global Lean Manufacturing project involving all the plants in US and EU.

In the Italian manufacturing Plant in Chiuro, together with the coil production line renewal, managers group promoted a sustainable B-BS project promoting behaviors targeted not only to safety but quality and efficiency as well.

The project, still ongoing, was set up during an ambitious redefinition of the department layout building new structures and introducing modern equipment and machinery. Startup phase last 8 weeks included a specific OBM training for shop floor leaders and the definition of observations and promotion methods of desired behaviors.

Success is witnessed by all target reached and the drastic improvement in work environment perception by the operators.

Keywords: Organizational Behavior Management, Lean Manufacturing, Behavior-Based Safety, Quality, Efficiency

INTRODUCTION

Our HSE Manager, Flavio Volonté, is always looking for opportunities to improve the safety attitude of all of us and thanks to him we decided to invite Professor Tosolin to our factory to understand what OBM and B-BS is all about.

After the first managers training we decided to identify an area in Chiuro Plant where we could exercise the skills gained.

In 2012 Coil Fabrication department was ready to be the first Lean Manufacturing shop of Baltimore Aircoil all over the world. This strategic pilot project would have been a benchmark for future implementation in other countries.

Company deployed a huge investment to completely renew coil production line and installing a new semi-automatic tube bender. Just to give some figures the department

area of 1500sqm got in two month a new loft of about 200sqm and a completely new welding line fully equipped of about 270sqm.

Together with structures and equipment a big job was done in order to redefine department organization: all accounted leaders and key role persons got a new and detailed job description. All activities were defined writing and releasing proper working instructions.

To ensure success to this ambitious project, managers decided to invest in people, the most important capital of the company, through OBM and B-BS.

TRAINING AND SET UP

First step of the project was to train the shop floor leaders about the behavior management. During the first two classes Professor Tosolin introduced them to the concept of behavior and give them the tools to stimulate such as feedback and reinforcements.

During further training sessions leaders developed their own ability to observe behaviors and understand which of them drive to safety, quality or efficiency. This is a crucial step, since observing people working was a chance to write detailed work instructions together with the identification of correct behavior to measure and stimulate in the future.

During set up phase check lists were published together with the work instructions. While working on them, the leaders suggested us to extend observations not only for safety purposes but for quality and efficiency as well. This is a real great added value of the project because we could implement a single tool covering the most important topics of any metric set of a modern shop: Safety, Quality, Efficiency.

The use of a single tool to collect all the observations is really appreciated by the managers because it is extremely lean and drastically reduces the paperwork related to registration. Furthermore this aspect is important just because Baltimore Aircoil gives great importance to the non-production hours reduction and Chiuro Plant organization reflects this being much more operations oriented if compared to other plants of the same group.



Figure 1 – Observation score for behaviours related to Safety - Quality - Efficiency

IMPLEMENT AND SUSTAIN

Behavior management is a big chance for any leader to better know the people they work with. Anyway, it takes some time to get use to observation and to distribute effective feedback or reinforcements.

Thanks to the help of Ms. Maria Gatti, our leaders improved their skill to observe behaviors and they got the right tools and examples to sustain the positive ones and extinguish the not desired. This is not a minor aspect of the project: training is important as you may discover that even a good leader is more use to look around instead of really watch what's happening!

Aside the day routine, one detailed tour per week is due in order to register observation score. Together with the work instructions, well known by the leaders, they made a check list referenced to each step describing how to perform the job. This was done per working station and every single station has at least one point of observation related to safety, quality and efficiency. Check list and work instructions are a good tool to train new employees and follow up as well.

CONCLUSIONS

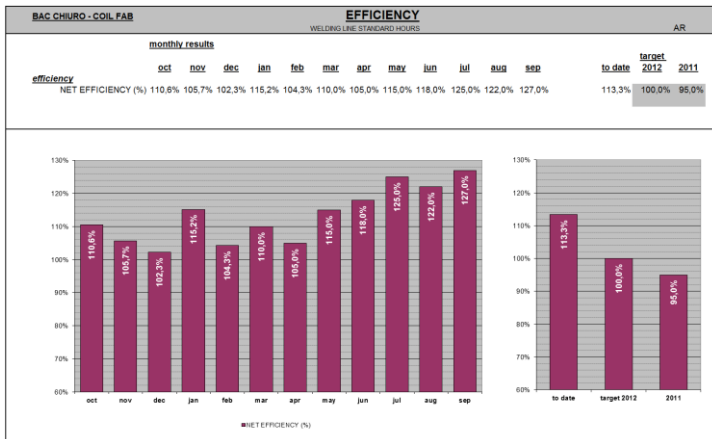
In the startup phase we registered the three different scores about the percentage of desired behaviors versus not desired: the basis was around 45% and 65%. At the same time we started the exercise to deliver positive reinforcements. To improve this aspect the managers measured at early beginning the numbers of R+ versus the R- of all the leader involved: the purpose is the provide feedback to them. Furthermore the managers tried as much as possible to be present during the day routine in order to distribute

themselves R+ to the Leaders.

The growth of desired behaviors is proportional to the those of R+ versus R- : in the following 8 weeks we saw values around 70% and 90%.

Observation Score regarding Quality and Safety are used as official department metrics giving us an immediate feeling about how people is working without waiting warranty claims or accidents.

From the Efficiency perspective, we can see a correlation showing an awesome trend starting from the first month (May 2012) we applied the protocol. Thanks to this, we ensured a great success to the whole project reaching the minimum target set at the beginning to pay back the investment. Furthermore we got really positive feedback from people who appreciated the overall working environment change, witnessed at least by the reduced absenteeism during the period (3% average second half FY12 Coil Fab only, 4,5% average FY12 Coil Fab only, 3,3% average FY12 whole Plant).



Picture 2 – Welding Line Efficiency FY12

AUTHOR

Luciano Falciani graduated in Mechanical Engineering at Politecnico di Milano in 2004. He has deep knowledge of Sheet Metal process and Pressure Vessel manufacturing according PED directive. He directly led main fabrication department in Chiuro Plant for Baltimore Aircoil taking care of introducing Lean Manufacturing tools in order to reach higher level of quality, efficiency and on time delivery.

He is currently in charge as Plant Superintendent in Chiuro for Baltimore Aircoil. Core business of the company is refrigeration market manufacturing cooling towers, fluid coolers, condensers and thermal storage units. Baltimore Aircoil is worldwide established and serves from Chiuro plant together with Heist plant (Belgium) Europe,

North Africa, Middle East and UAE.