

CASE STUDY

PERFECTING MACHINE OPERATIONS WITH PERFORMANCE SOLUTIONS

Plants in the paperboard and packaging (P&P) industry are often highly dependent upon a few machines, or even a single massive piece of equipment. Issues with these tools — minor stops, quality problems, safety hazards, machine failures — damage a plant’s output and its bottom line. P&P plants need a system with standard practices to ensure that mission-critical equipment runs at perfect or near-perfect levels at all times.

PERFORMANCE-IMPROVEMENT OPPORTUNITY

The plant’s managers had applied elements of lean manufacturing, quality-management, and continuous improvement for many years. Performance Solutions was invited to assist with total predictive maintenance (TPM) activities, which were less developed, and to foster more employment involvement, as opposed to the existing management- and engineering-led decision-making.

“TPM activities and employee training were probably this plant’s biggest challenges,” says Battocchio, who, like all Performance Solutions practitioners, has held a variety of leadership roles in Milliken plants. “They have a lot of complicated jobs and high complexity, but did not have a thorough, consistent training process. This meant that there was very little standard work, and the level of detail in their SOPs [standard operating procedures] was limited.”

These maintenance and engagement issues prevented the plant from achieving optimum throughput and high overall equipment effectiveness (OEE).

WORKING WITH PERFORMANCE SOLUTIONS PRACTITIONERS

This plant consists of an enormous corrugating machine and various support equipment and services, such as packaging. Performance Solutions started this engagement by helping leaders

and workers to identify constraints that slowed throughput or negatively impacted OEE. One significant constraint was the packaging area downstream from the corrugating machine, where

the sheets are labeled and bundled for shipping.

“The whole area was slowing the machine down,” says Battocchio. “They could not

CLIENT

This multibillion-dollar manufacturer operates hundreds of plants and manages thousands of employees, with paperboard and corrugated-products divisions. The company has been assisted by Performance Solutions by Milliken at dozens of plants across North America.

James Battocchio, an advanced practitioner with Performance Solutions, worked with one of the company’s corrugated plants. This facility produces a complex mix of goods: 1,000 to 2,000 SKUs per week, with as many as 150 different SKUs in a single shift. Multiple SKUs are often produced on the same machine, at the same time: a large machine (approximately 250 yards long) sandwiches and glues a zigzag-patterned paper between two other papers, at speeds up to 500-feet per minute. The same machine then cuts this corrugated sheet into box sizes: a 90-inch-wide sheet is sliced into 40-inch, 30-inch, and 20-inch lengths. These flat sheets are then bundled and sent to finishing plants, where they become television boxes, home-delivery containers, specialty displays, etc.

THE BIG PAYOFF FROM THE SKILLS
DEVELOPMENT WORK FOR THIS AREA
WAS IMPROVED QUALITY

get material off the end of the machine as fast as they could run product into the machine.”

Performance Solutions assessed training of employees in that area, as well as the capability of a recently acquired strapping machine — could it efficiently create bundles while not holding up the line? Performance Solutions also organized “pillar teams,” consisting of a supervisor and frontline associates, to apply improvement principles based on the pillars of the Milliken Performance System. Pillars included those associated with TPM — planned maintenance (i.e., equipment reliability) and daily team maintenance (i.e., the daily operator interface with the machine) — as well as continuous skills development.

For skills development, the team undertook a rigorous process of identifying all job elements required to perform packaging roles efficiently and correctly. To do this, the pillar teams and Battocchio observed three eight-hour shifts, documenting the work of nine frontline associates on each shift, as well

as maintenance personnel and other support staff.

Job elements consist of both knowledge and skills: Knowledge is assessed via written tests (does an employee know what to do?), while skills are evaluated by observing demonstrated ability (consistency of practice and speed). The pillar team identified approximately 100 job elements for this area, a typical number for most production jobs. Yet many of these job elements were insufficiently supported with training materials and/or on-the-job guidelines.

The pillar team then reviewed current training materials, assessing their content, clarity, and ease of use. Next, the team standardized these materials, applying a greater level of detail for SOPs and standard work, and developing visual standards to assist frontline associates.

“For example,” says Battocchio, “Instead of just referencing what a control panel does in a manual, we put a picture at the control panel that identifies all buttons and describes what each does — and how it should be used.”

As part of the TPM improvements, Performance Solutions determined that the new strapping machine was contributing to problems. Battocchio and the pillar team established benchmarks for how the equipment should function, then developed a correct preventive maintenance schedule that would ensure reliability across the three-shift operation, and set up an inspection and cleaning schedule for frontline associates.

“These were key to the success of the project,” he says. “For example, there was lint buildup due to the nature of the products. So understanding the cleaning cycle and frequency — and where they needed to focus their cleaning labor — reduced the number of mishits by the strapping machine, and the number of minor machine stops.” A machine mishit can result in a missing strap or one that requires rework, both of which then require operator intervention and space to store rework jobs. Because this area ships directly from the packaging machine, even a modest rework buildup can halt the overall operation.

POWERFUL IMPROVEMENTS

Within two months, teams had reviewed all job elements. Over the next six months, SOPs were updated and all staff were retrained to new standards. Because the packaging area is typically staffed by entry-level employees (the plant promotes from there to other locations), Performance Solutions also developed an onboarding process to rapidly acquaint new hires with the job elements and prepare them for the area.

“The big payoff from the skills development work for this area was improved quality,” says Battocchio. “We reduced the number of customers either getting the wrong material or receiving the wrong count of material, in part because we reduced the number of incorrect labels or tickets. When we started, the baseline was 0.3 percent of sales with quality rejections. By the end of our improvement process, it was cut

almost in half — 0.16 percent as a percent of sales. That’s approximately \$200,000 in savings.”

Equipment effectiveness also improved: OEE for the 10-month period went from 47.25 percent to 50 percent, resulting in another \$250,000 in savings. Even better, the plant is on pace to hit its first-year goal of 54 percent OEE.

FUTURE SUCCESS

In less than a year, the plant achieved a significant return on investment (ROI), and is now expanding implementation to other areas of the plant. For example, pillar teams and Performance Solutions are examining production steps within the corrugating machine itself, identifying mechanical or quality factors that slow

production. A pillar team also is working to eliminate minor stops for various machine functions.

Battocchio says that during the second and third year of a Performance Solutions engagement, ROI increases significantly. As one area of a plant applies the pillars

of the Milliken Performance System, the system and its objectives become familiar throughout the plant and in other operations. “The teams that have been through the process begin to train other teams to do the same, and your bandwidth — and your results — get bigger. You start doing more faster.”

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