

MACHINE DOCTORS: A PRESCRIPTION FOR TEAMWORK

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THE MACHINE DOCTORS ARE A VOLUNTARY EMPLOYEE ACTION TEAM FROM APPLETON PAPERS INC. IN WEST CARROLLTON, OH, WHOSE PRESCRIPTION FOR SUCCESS HAS CONTRIBUTED TO THE WELL-BEING OF THEIR ORGANIZATION.

Teamwork and employee participation are the managerial buzzwords of the 1990s. Participative management, autonomous work forces, and diverse, flexible work groups are some terms in use today. Everyone seems to espouse the benefits of employee involvement teams.

Although the benefits can be substantial, teamwork is more than a group of people gathered to solve a problem. Like good leadership, good teamwork is not a born skill. It is something requiring learning, practice, and proper support to be effective. Dedication and a willingness to participate, although required for a successful team, will not work alone. Teamwork skills are necessary to realize the full potential of a team. It requires training, time, and investment. The following is the story of the Machine Doctors—a voluntary employee action team from Appleton Papers Inc. in West Carrollton, OH.

ity of approximately 80 tons per day is an old, small, and slow machine in the company. The No. 91 paper machine makes approximately 10 different grades of coated carbonless paper in seven different colors with basis weights of 34-114 lb.

Recent technological advances have combined to push the carbonless paper market to maturity. Demand

for carbonless paper has declined worldwide over the past few years. Carbonless paper manufacturers are beginning to feel the effects. The initial casualties of a declining market are usually the oldest, smallest, and slowest production facilities within an organization. This prompted management to make some changes in the operation of No. 91 paper machine.

Because of corporate strategic objectives, the role of the unit is now that of a quick-change and small-order machine. This role provides flexibility for the company by allowing the bigger and faster

machines to have long production runs without affecting short lead times to customers. It also allows the other machines to start production of other product lines as the carbonless market declines. The strategy has resulted in a significant increase in the number of grade changes for the No. 91 paper machine.



1. Machine Doctor members are (1st row) Crystal Roush, Luther Cummings, and Andy Focht; (2nd row) Eric Huggins, Rick Francis, Fred Zouck, David Brown, Lucky Castle and Scott Delph (Dave Knoll is not pictured)

BACKGROUND

The West Carrollton mill is a union shop that employs approximately 450 people working as a four-shift operation for 24 hours each day for 365 days per year. The mill has three paper machines with a recycling plant. Of the three machines, the No. 91 paper machine with a capac-

BEGINNINGS

The group designated as Machine Doctors formed approximately two years ago when co-workers on the same shift of the No. 91 paper machine voluntarily decided to cooperate to help solve some machine problems. They were a natural work team incorporating the machine crew and the crew leader. Their first project was to address problems with the doctor blades on the machine. Unfortunately, they struggled severely as a team to solve this problem. They did not have any experience in teamwork and problem solving. They had no facilitation skills and no sense of direction or focus. The group was merely people arguing about the bad state of the doctor blades. In addition, they faced some significant peer pressure against this type of involvement from other co-workers in the mill. Employee involvement was then new in the mill and the “us” vs. “them” mentality was still prevalent. After three months and a dozen meetings, the team was no closer to solving the problem than when they began. The team was very frustrated. They lost a few team members as people gave up. The situation looked dismal!

Then prospects began to improve. The team leader attended a problem-solving training seminar for one week. Shortly afterwards, the remaining team members received training in teamwork, problem solving, and facilitation skills. It became apparent during this time that just having machine operators on the team was not sufficient. The team required expansion to involve a more diverse group that also included support personnel. The skills the team leader learned indicated that the team itself needed considerable work before even considering solving problems. They had to define the team and its goals.

DEFINING THE TEAM

Defining the team was the critical part of the development that propelled the members from a mere group of people meeting together to a team in every sense of the word. They spent four months identifying their roles and goals, defining team values, creating a mission statement, and determining rules for the facilitation of team meetings. They also learned and began using various problem-solving techniques and models. Although this was a long and difficult task, the mill management was very patient and supportive. The team had little to show at this time for their efforts. Management's investment in the team would pay for itself later when the team met with adversity. They started by defining their team values.

The Machine Doctors devised the following team values:

- No personal attacks—show respect to others

- Commitment is priority No. 1—nonconditional
- Accountability
- Work toward measurable results
- Take risks
- Value everyone's opinion
- Continuous improvement—stay focused
- Have fun!

These eight values are the code of conduct for the team and the method to measure team behavior. The next step was to adopt the following team mission statement:

- We, the No. 91 paper machine doctors, will aggressively pursue opportunities to improve the performance of our machine continuously, the safety of our people, the satisfaction of our customer, and the quality of our work life while ensuring our long-term job security. We will accomplish this by identifying problems, planning solutions, committing ourselves to action through measurable methods, communicating effectively, and following up until we deliver.
- We will do it!

The group lost a few members and gained a few members. The main result was an evolution into a more efficient, dynamic, and stronger team. With the support of management and an understanding of the No. 91 paper machine's new role in the company, the team began to identify opportunities for improvement. With the investment in the development of the team and its members, the group was prepared to take action. The team could see where the future of the machine was going, and they felt that being proactive would not only save money but also ensure their jobs in the future.

PROBLEM

The team brainstormed or thunderheaded—to use their term—for issues that influenced the grade-change efficiency on the No. 91 paper machine. Of the five top categories of broke, three were a result of a grade change. The No. 91 paper machine was averaging approximately nine grade changes per week. Annual losses incurred by the No. 91 paper machine for grade-change-related broke and downtime were almost US\$ 1 million. Note that this high level of loss was expected and accepted by management. The culture was such that this was “simply a cost of doing business.” A million-dollar loss in a year was not a crisis.

The Machine Doctors ranked all the ideas generated by the thunderheading session and developed a cause-and-effect diagram or fishbone to record and separate them into categories. At the conclusion of the session, the team had a large list of areas and issues to examine for

problem solving. Having a diverse team of operators and cross-functional support people made for lively discussion and some truly original ideas. The group defined their problem and set a goal to reduce average grade-change time and grade-change broke on No. 91 paper machine by 35% with no negative impact on machine efficiency. The team felt that they should attempt a substantial reduction in this critical area. They further sorted the list into short-term and long-term fixes and identified those areas that required capital investment. Obtaining capital dollars for a 70-year-old slow machine would be difficult. If they could prove themselves, the team felt that anything was possible. They therefore concentrated their initial efforts on ideas that they could tackle immediately and cheaply.

QUICK SOLUTIONS

The main "quick fix" was to create a better grade-change tracking system. Little reporting on grade-change efficiency existed. Available tools were generic in nature and applied to grade-change efficiency as an average over a month. Since the team needed more information on individual grade changes, they developed a database. It individually tracked broke and machine grade downtime for every grade change. The team also used an informational tool already in place at the mill—a process variation reduction system (PVR). This system involved examining lab data, log sheets, and operator workbooks daily to identify nonconformance issues and take immediate corrective action. Although the PVR system did not concentrate on grade changes in particular, the team modified parts of the process to meet its needs.

The Machine Doctors began using their newly developed databases and PVR system to communicate the results of every grade change to all machine operating crews daily. For every change, they reported the actual time, the average time for this change, and the record time. The results of these communications were surprising. They fostered a healthy competition among all the crews. The first few months saw many broken records. During this time, a period of intense job-shadowing and training among and between team members also began.

After implementing these quick fixes, a dramatic drop in grade-change broke and grade-change time occurred. The grade-change tracking and the communication of actual results decreased costs per grade change significantly.

The next step was to expend effort in some longer-term solutions. The team felt that installing an on-line color measurement system, implementing standard operating procedures across the machine, and benchmarking other mill's grade change procedures were the top permanent solutions to improving grade-change perfor-

mance. Some items on the list required capital investment, and others did not. During this time, the Machine Doctors began to ask management for some capital dollars. While that process was occurring, some team members went to other paper mills within and without the company to benchmark grade-change procedures.

PERMANENT SOLUTIONS

The results of these activities and the Machine Doctors' training efforts became part of the standard operating procedures. The team found that several operators did the same job in different ways. With cooperation among all the operators, procedures were written for grade changes. These procedures used the most efficient processes from each person. Implementation of the standard operating procedures was a long and tedious process. With four different crews and 24-hour work schedules, assembling everyone for opinions and evaluation was impossible. Every revision or change took some weeks to implement. The machine doctors are still fine-tuning the standard operating procedures today.

The No. 1 item on the team's list for improvement—on-line color measurement—was a solution they felt could give the biggest payback. Before installation of on-line color measurement, a color reading involved manually tearing out a piece of the paper while the sheet was running through the machine and taking it to the lab for analysis. This procedure could consume 15 minutes. With an on-line color monitor, continuous readings occur with display on a computer terminal every 10 seconds. The operator finds this easy and efficient to monitor the color. The time savings during a color change result in monetary savings. The on-line color monitor also enabled establishment of some setpoints for each color so operators could better estimate dye use requirements for the beginning of a color change.

Implementation of a piece of equipment of this magnitude normally involves approval of capital money. The supplier agreed to provide the equipment free-of-charge for a trial period. After the trial period expired, there was an option to lease or buy the equipment. The supplier provided training for the equipment. Although implementing the system was difficult with many starts and stops, some significant improvement in the color grade changes occurred. The system has proven its worth. After the trial period, leasing of the equipment made it a permanent part of the No. 91 paper machine process.

PAYOFF

The results of these efforts speak for themselves. Every type of grade change showed a significant drop in downtime and broke. In 1996, average grade-change time decreased 33% from 1995 results. Grade-change broke

diminished 24%. These savings are very significant given the small size of the machine. They flow directly to the company's bottom line. Although everyone involved with this effort was pleased, the team viewed the results with some "celebrated" discontent. They are proud of their achievements, but they are not completely satisfied. When comparing the results with the original goal, one can see that the results have fallen short of the 35% reduction goal. The year 1997 has been difficult, but the team managed to maintain the downtime reduction and improve on the broke reduction.

Other benefits achieved with this project are hard to measure in monetary terms. The color monitor helps the operator watch color variations so that corrective actions can occur more quickly. With the standard operating procedures, this allows the mill to produce a more consistent product. That makes the customers very happy. Another benefit is that operators spend less time in the hot, humid environment of the paper machine during grade changes. Less time spent on the floor leads to better operator comfort and safety. The excitement and goodwill generated by this project have been very uplifting. The team's success has been recognized at the top levels of the organization and their story has been shared throughout the company. This can only help in the machine doctors' quest to remain an important part of making paper for Appleton Papers Inc.

The Machine Doctors had a great year in 1996. The team is a group of dedicated and participating employees committed to the improvement of their job life. They discovered early in their team's development that it takes

teamwork skills to be truly effective. Although big parts of their success as a team, dedication and a willingness to participate did not work by themselves. A defining moment in the Machine Doctors' development was the training they received in teamwork, problem solving, and facilitation skills. The investment made in developing the team's values and team mission statement paid huge dividends for the team during the long, tough road of improving grade-change efficiency. This was only possible with the visible and solid support of mill management and the never-say-die attitude of the team. The keys to incorporating effective teams into organizations are managerial patience, voluntary participation, and effective training for all team members in the skills of teamwork. With these keys in place, teams are capable of outstanding accomplishments. TJ

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