Operation's Inspections Drive Reliability

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INTRODUCTION. Smurfit Stone's Fernandina Beach facility continues on a long path to reaching world class reliability. In 1999, the mill embarked on a courageous effort to revitalize its reliability program. The mill had a vision of being "world class" and set out on a course to achieve this goal.

At that time, the entire pulp & paper industry was going through a paradigm shift. The market now dictated that only those facilities that focused on lowering cost would remain competitive in a global market economy. More tons out the door would no longer improve the facilities profitability. Reducing cost and improving operating efficiencies was required to ensure that the Fernandina Beach facility would be a long term provider of linerboard. The mill's management team realized that significant improvements in plant maintenance and equipment reliability were critical to driving down the overall cost of manufacturing, and thus ensuring the facilities position in the market place.

Since 1999, many of the changes in the mill's reliability effort have primarily been in the maintenance department. However, to achieve world class results, operations must be a core component of the reliability process. Recently, the mill has begun to incorporate operators in critical reliability functions.

The Fernandina Beach woodyard seemed like the perfect area to begin incorporating reliability principles. The woodyard management team was fully supportive of reliability concepts and principles, understood that operators could have a very positive impact to the maintenance process, and was willing to commit resources to implement new processes into the operators work flow.

THE MILL. Fernandina Beach is a fully integrated, ISO 9001:2000 Quality Management System certified mill with three paper machines. The mill was established in 1937 to produce kraft linerboard. Original production was 125 tpd of unbleached kraft pulp and has progressed through expansions and rebuilds to a production rate of 2850 tpd. Fernandina Beach operates a large woodyard receiving chips and round wood, batch and kamyr digester pulp mills, and a chemical recovery system including two recovery boilers, two power boilers, and two turbine generators.

RELIABILITY JUSTIFIED. The current state of the industry has led to new business practices in lieu of large capital expenditures to maintain the competitive edge. Additionally, traditional woodyards are being replaced with satellite chipping operations. A traditional woodyard process, such as Fernandina Beach's, consists of very large mechanically driven equipment and numerous conveying systems that must withstand the destructive nature of wood raw materials. Therefore, to remain cost competitive with satellite facilities, it requires implementation of maintenance processes that counteracts the negatives of operating a traditional woodyard. The traditional woodyard must be highly reliable and proactive to keep the cost of running the business to a minimum.

In 1999, 70% of all the Fernandina Beach woodyard maintenance repairs were reactive in nature. The Woodyard was experiencing increased production and safety vulnerability, poor employee morale, lost production, and higher maintenance costs due to poor equipment reliability. At this stage, the woodyard was highly reactive; the decision-making process was being dictated by the equipment and not by the management team. The decision by Fernandina Beach to completely revisit and revitalize the entire mill's preventive maintenance program in 1999 was a welcome site for the woodyard operating department.

IMPLEMENTATION. By 2001, changes in the mill reliability program were well underway. Condition Monitoring Routes (CMR) in the woodyard with mechanical maintenance technicians/millwrights was proving to be successful. Woodyard management recognized

the value of the reliability process and began developing a strategy to incorporate the process at the operator level. The initial thought was that the process would not be successful if it was not driven at the operator level. This philosophy still holds true today.

The vision was to develop a world-class, employee driven process that would be measurable and achievable. This new way of conducting business would become the Fernandina Beach Woodyard maintenance doctrine.

The management steps used to implement a new equipment reliability doctrine was:

- educate the woodyard management and supervision on the concept of reliability
- conduct awareness meetings with the operators on reliability practices
- gain upper management support to acquire tools and re-direct resources
- train operators in proper equipment inspections
- develop operator condition monitoring routes

PROCESS. The woodyard wanted a short implementation cycle yielding immediate results. With the maintenance department having already established condition monitoring routes, it made good sense to use their existing program and make minor modifications to accommodate the operator requirements. Requirements of the operation's CMR process included more frequent inspections, but with less detail than the mechanical CMR route. The mechanical inspector in the area essentially inspected every piece of equipment in the woodyard during an inspection cycle of one month. To be effective, woodyard operators could not inspect all equipment with the same level of detail. The woodyard reliability team* decided that operators would be more effective by focusing on critical equipment only.

** The woodyard reliability team consists of the woodyard department manager, the maintenance supervisor, a reliability maintenance supervisor, and two woodyard operations supervisors.*

The woodyard reliability team developed a model to assess equipment criticality. Over 400 pieces of equipment were evaluated individually. The following categories were considered for each piece of equipment:

- Safety and Environment Impact
- Cost of Repair
- Impact to Production
- Quality Impact
- Availability of Parts
- In-line Spare
- Repair Time

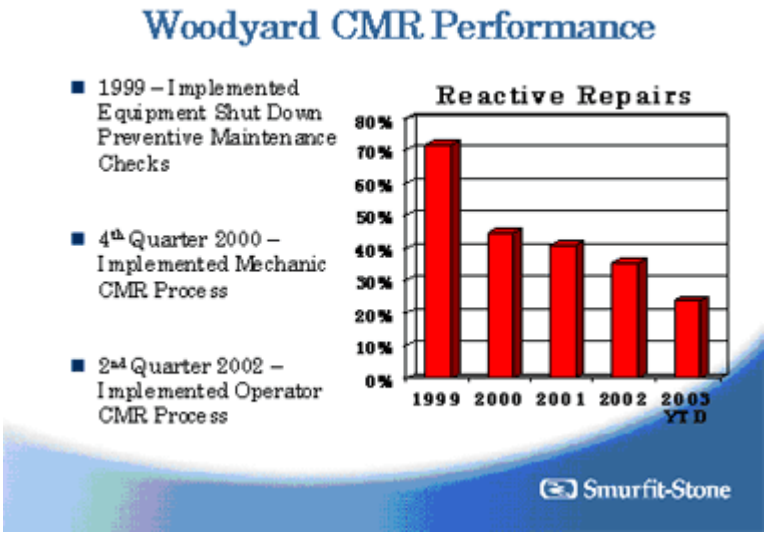
The evaluation resulted in 83 of 400 items in the woodyard and all associated components deemed critical. Critical equipment was placed in one of the four condition monitoring routes listed below:

- Log System (16)
- Bark System (6)
- Chip System (17)
- Chip Thickness Screening (44)

In 2991, woodyard operators began performing inspections on critical equipment as part of their routine shift responsibilities. A typical inspection requires the operator to simply look, listen, and feel the equipment to assess condition. Operators have also been given additional tools to support the inspection process such as hand held computers and infrared temperature guns to facilitate capturing and recording bearing, motor, and other component temperatures.

RESULTS. Today, the Fernandina Beach woodyard maintenance process is a proactive process. The CMR process, with operator involvement, has resulted in a 70% reduction in reactive repairs since 1999. Reactive work for 2003 (as of July 2003) is down to 24% with a world class target of 5% as a goal. Recent data has shown operators are now responsible for identifying almost one-quarter of all critical equipment issues. During the same period, the woodyard's maintenance budget has been reduced by almost one-third.

Additionally, recent woodyard case studies support suggestions that proactive repairs can be as much as five to ten times less expensive than repairs that are performed on a reactive basis; unplanned and unscheduled. They have learned that identifying equipment issues much sooner in a failure mode means less intrusive repairs requiring less time to complete. The Fernandina Beach woodyard is focusing on a path of more effective and efficient planned and scheduled work.



CONCLUSION. As most realize, implementing change can be difficult to execute. The Fernandina Beach Mill woodyard management team believed that gaining initial support from the employees would improve the odds of a successful change process. The team realized that being world-class would require operations personnel to take back ownership of their equipment. There has definitely been a culture change in the right direction.

It is understood that changes have to continue to take place in order to move closer to the goal of world-class. It is important to understand and communicate to the workforce and upper management that significant results are not expected overnight. Nevertheless, the impact to the workforce morale, safety and housekeeping has been positive and immediate. That alone justifies the implementation of the CMR process. The woodyard has seen some early and very significant improvements to equipment reliability, but the new relationship between operations and maintenance holds real promises for the woodyard to remain a long-term, low cost, provider of wood chips to the Fernandina Beach facility.