Eliminating Downtime:
A Structured Approach to World Class

by Preston Ingalls

BARRIERE
CONSTRUCTION CO., L.L.C.

Under the leadership of Kevin Ervin, Operations Manager of Asphalt Facilities, Louisiana-based Barriere Construction Company has made great improvements in plant uptime and operations efficiencies.

Barriere Construction Company, LLC is a third generation family-owned business that specializes in construction services, Hot and Cold Mix asphalt, materials, and industrial project services for a variety of development efforts throughout Louisiana for both the government and private sector. Ervin joined Barriere in early 1999 and is responsible for maintenance and operations of the company's two asphalt facilities and a burgeoning gravel mining operation.

Barriere's asphalt facilities supply mix to three paving crews on the South Shore and two main line crews on the North Shore. The operation also supports Barriere's retail customer base. The constant demand for asphalt requires a strong dedication to preventative maintenance and continuous process improvement at the production facilities. Ervin says his goal is "to try and maximize operations everyday," which can be challenging when production needs change on a daily basis.

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1. Buy good equipment and service it well.

Barriere's two asphalt facilities are home to nearly fifty major components and a $4 million equipment inventory that include silos, transfer conveyors, storage tanks, baghouses, and dryers. If one piece of equipment isn't functional, operations can shut down entirely. With production rates of 400 tons of asphalt per hour per facility, even one lost day can severely impede Barriere's project commitments.

Prior to purchasing major pieces of equipment, Ervin and members of his team spend days at the equipment manufacturing facility developing an understanding of the machinery they are considering. "We buy what is built best," says Ervin. "We will spend extra money to get quality." That also includes maintaining service contracts with their primary equipment vendors.

PICTURE LEFT: KEVIN ERVIN, OPERATIONS MANAGER OF ASPHALT FACILITIES

The Operations team's primary goal, says Ervin, is to keep equipment in like-new or better condition. Following the CLAIRE methodology (clean, lubricate, adjust, inspect, repair, eliminate), components are painted and cleaned on a regular basis, in addition to preventative maintenance that now includes temperature trending and vibration analysis twice weekly and thermography semi-annually. The approach is paying off. Facility uptime hovers at 98%, a marked improvement from the 50% range in 1999.

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"In an asphalt plant, there is no 'book' to identify service time-lines," says Ervin. He relies on their Explorer CMMS to track and trend equipment maintenance, produce preventative maintenance work orders, and capture money and labor spent on each component.

Ervin tracks key performance indicators that include mean time between failure (MTBF), overall equipment effectiveness (OEE) and preventative and predictive maintenance rates. He also relies heavily on information collected and displayed on pareto charts, or graphical representations of data showing relative importance. Each time an unplanned stoppage occurs at a facility, Ervin's team records the reason, length of time, and root cause. This information is then displayed on a pareto chart and reviewed by the group weekly to assess how to avoid unplanned downtime.

These are some Key Performance Indicators (KPIs) Kevin tracks:

- **Overall Equipment Effectiveness (OEE)**
- **MTBF on Critical Equipment**
- **% PM**
- **% PdM**
- **% PM Schedule Compliance**
- **% Corrective from PM/PdM**
- **PM to CM (that is the ratio of Corrective to PM)**
- **RCFA Caps Completed Within 30 Days**

2. Think in terms of the big picture.

When faced with a failure resulting in a loss of $2,000 or more, Ervin's team conducts a Root Cause Failure Analysis (RCFA). Armed with the analysis, they then determine alternatives to address the failure and apply a Return on Net Assets (RONA) formula to calculate the best longer-term solution. "I look at how I'm going to get my payback," says Ervin. "If it comes in less than three years, [the solution] is generally a go."

For example, when a bearing went out in a main drag slat conveyor, RCFA determined that a grease line to that bearing had been broken. While the expected bearing life was one million tons, the faulty part failed at its half-life (or 500,000 tons) and required the use of a crane to replace, which added additional expense and downtime.

Solution alternatives included replacing the bearing (a $10,000 investment) or changing to a different kind of bearing (a $13,000 investment) which allowed for visual inspection, temperature and vibration analysis, and maintenance. Though the change in bearing cost $3,000 more than a straight replacement, when Ervin calculated the Return on Net Assets (=Net Assets/(Fixed Assets + Net Working Capital)), the more expensive alternative was actually the better business solution. Ervin now expects the new bearing life to be one and a half million tons, or three times that of the original bearing.

Another long-term investment Barriere makes is their decision to shut down for a week each year between Christmas and the new year. The Operations team spends three months coordinating and scheduling planned maintenance activities that will occur during the shutdown. During this time, as much as $100,000 is invested in preventative maintenance and refurbishment activities.

3. People are an asset.

Ervin says he believes in hiring “good people with good management skills.” Barriere, he says, targets the top people in the industry based upon the desired criteria for a particular position, and compensation is “towards the top of the [industry] pay range.” Ervin specifically looks for employees who are teachable and dedicated as well as capable of bringing new ideas and thought processes to the team.

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“You can also use the Return on Net Assets formula with people,” he says. “If I can pay someone a high-end salary who brings experience and ideas to the table, they may be a better investment than someone with a mid-range salary who lacks those things.”

In addition to the two plant managers, two quality assurance managers, trucking foreman, retail sales coordinator, and gravel crushing operation manager he directly supervises, Ervin also meets weekly with managers responsible for Barriere’s asphalt paving projects. Prior to these meetings, project managers lay out their “wish lists”, the quantities and mixes of asphalt desired for a specific week. In the meetings, the group works together to analyze the previous week and look forward two weeks, with a goal of not only meeting project demands, but optimizing the plant facilities’ production operations.

Ervin also looks to those outside of Barriere who face the same daily challenges. Barriere has long been part of a peer group made up of others in the asphalt business in different geographical areas. Because its members do not compete in the same market, they share information and best practices on how to more efficiently run their operations and maximize profit. Says Ervin, “The peer group serves to shorten the learning curve on new modifications that some others may have done previously and learn and share operational methods that may increase wear or uptime.” Like his employees, Ervin views this group as a strong asset in improving his operation.

4. Adapt.

Ervin joined Barriere in January 1999 when the organization’s South Shore Hot Mix Asphalt facility became operational. Since then, he has initiated or been a major part of much change, including the implementation of Total Process Reliability (TPR), introduction of new equipment analysis tools, installation of a radio frequency reader system, and the opening of the North Shore facility in Franklinton in 2005. TPR is a process to improve equipment efficiency by getting the entire organization involved with asset management. However, the biggest change, and the largest challenge he has faced in his career at Barriere is their current move into the gravel mining business.

“After Hurricane Katrina,” says Ervin, “the market went crazy. Our aggregate supply dropped, while asphalt demand increased.” Aggregate is the natural, manufactured, or recycled material used to make asphalt. While the South Shore facility aggregate is largely limestone from Kentucky, the North Shore facility relies upon natural gravel from Louisiana. As a result of increased demand and regional changes brought about in the aftermath of Katrina, Barriere has acquired land and will soon begin to mine gravel to ensure the supply they need. Ervin is responsible for bringing that operation online.

Ervin understands that in order to get better, an organization and its people must adapt. A heavy rainstorm can shut down asphalt mixing operations, so Ervin monitors the weather and, if inclement weather is expected, he may re-arrange his crew’s work week to ensure both production needs are met and his staff has adequate time off.

Asphalt mixes can vary depending upon the specific needs of a project or customer. Therefore, planning is critical to achieve maximum production in each mix formula, taking into account all needs, rather than constantly switching back and forth between mixes and losing time. Currently, Actual to Planned production is at 80%; Ervin’s new goal is to improve operational efficiencies through better coordination between the field (project managers and retail sales) and the plant so that percentage increases.

By following these four basic management principles, Ervin has made Barriere Construction’s Asphalt Facilities truly world-class.