PREVENTING THE BIG SHUTDOWN

MAINTENANCE TIPS FOR VIBRATORY CONVEYOR AND SHAKEOUT SYSTEMS

Advanced monitoring and solid maintenance programs keep these foundry workhorses running.

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When vibratory conveyors and shakeout systems stop, foundry production ceases. To avoid critical downtime, foundries need to stay on top of maintenance. However, a combination of hot castings, sand, dust, and vibration creates an abrasive environment that takes a toll on liners, screens, and drive components.

"They're essentially eating themselves from the word go," said Jay Morrison, vice president of equipment sales for AFS Corporate Member Carpenter Brothers.

"Preventive maintenance inspections are very important to catch any parts before they fail and cause downtime in production," said Ryan Lumpp, North American foundry sales engineer at AFS Corporate Member JOEST.

VARIED APPROACHES TO MAINTENANCE IN U.S. FOUNDRIES

Manufacturers of vibratory conveyors and shakeout systems report a wide range of maintenance practices among foundries, ranging from reactive to preventative to predictive.

"Today's foundries have very limited time available for maintenance," said Claude Hutchens, foundry director for AFS Corporate Member General Kinematics. "To remain profitable, maximizing equipment uptime is critical, often leaving little opportunity for thorough repairs or proactive preventive maintenance. As a result, many maintenance teams are forced into a reactive approach, addressing issues only after failures occur."

"The most successful foundries implement great preventative and predictive maintenance," said Joe Fouts, project engineer at AFS Corporate Member Conveyor Dynamics. "I've seen thousands of dollars every year that could have been saved by just following a basic preventative maintenance schedule instead of just being reactive. Good maintenance departments are the heart of most foundries and deserve investment that will have real payback in less downtime, parts, and service."

AFS Corporate Member Mueller Foundry, located in Decatur, Illinois, has a predictive maintenance program that minimizes having to react to unplanned emergencies. It uses Tractian, a condition-monitoring software that predicts equipment failures using sensors that measure vibration, temperature, runtime, and RPM. Tractian's AI maps signal



Riley Kerestes (left), plant manager and Tim Oller, reliability engineer, discuss the Tractian preventative maintenance system results at Decatur Foundry in Decatur, Illinois.

patterns to specific failure modes (e.g., bearing wear, misalignment, unbalance) and sends alerts with suggested recommendations to managers.

"As an industry, we are far too focused and reliant on reactive maintenance," said Riley Kerestes, plant manager for Mueller's Decatur foundry. "I also think as an industry we have regressed in our ability to perform maintenance from even 20 years ago due to a lot of veteran skilled foundry maintenance technicians retiring and a lack of available maintenance professionals entering the industry behind them."

"With the ease of sensors to plug and play, collect data, and flag issues, condition monitoring has evolved to the point where it can help just about any customer," said Morrison.

COMMON MISTAKES AND HOW TO AVOID THEM

According to Lumpp, one of the most common causes of downtime is a failure to keep the area under and around the machine clean and clear of any sand or obstructions. "Our vibrating machines all require a certain clearance to be able to function properly. When there is no clearance, the unit will try to operate and break reactor springs and components." He recommends inspecting below the equipment at least once a day to ensure the area is not filling up with spill sand and debris.

"We have seen instances where operators let our mold dump conveyors get buried in sand specifically at the end of a production shift," said Lumpp. "The operator of the mold machine ramped up the cycle time to 'empty' the system. In this instance, the cycle time was way too fast for the mold machine, so sand just piled up around it. On the next shift, instead of trying to clean up the spilled sand, operators just turned on all the equipment and damaged the conveyors and machinery."

According to several manufacturers, overloading or over stroking is another cause of downtime. "The eccentric shaft on a conveyor that gives it the stroke, or the vibration, that gets amplified through reactor springs," said Lumpp. "The reactor springs can fail if they are overstroked or if there's debris or something preventing the reactor spring from functioning properly."

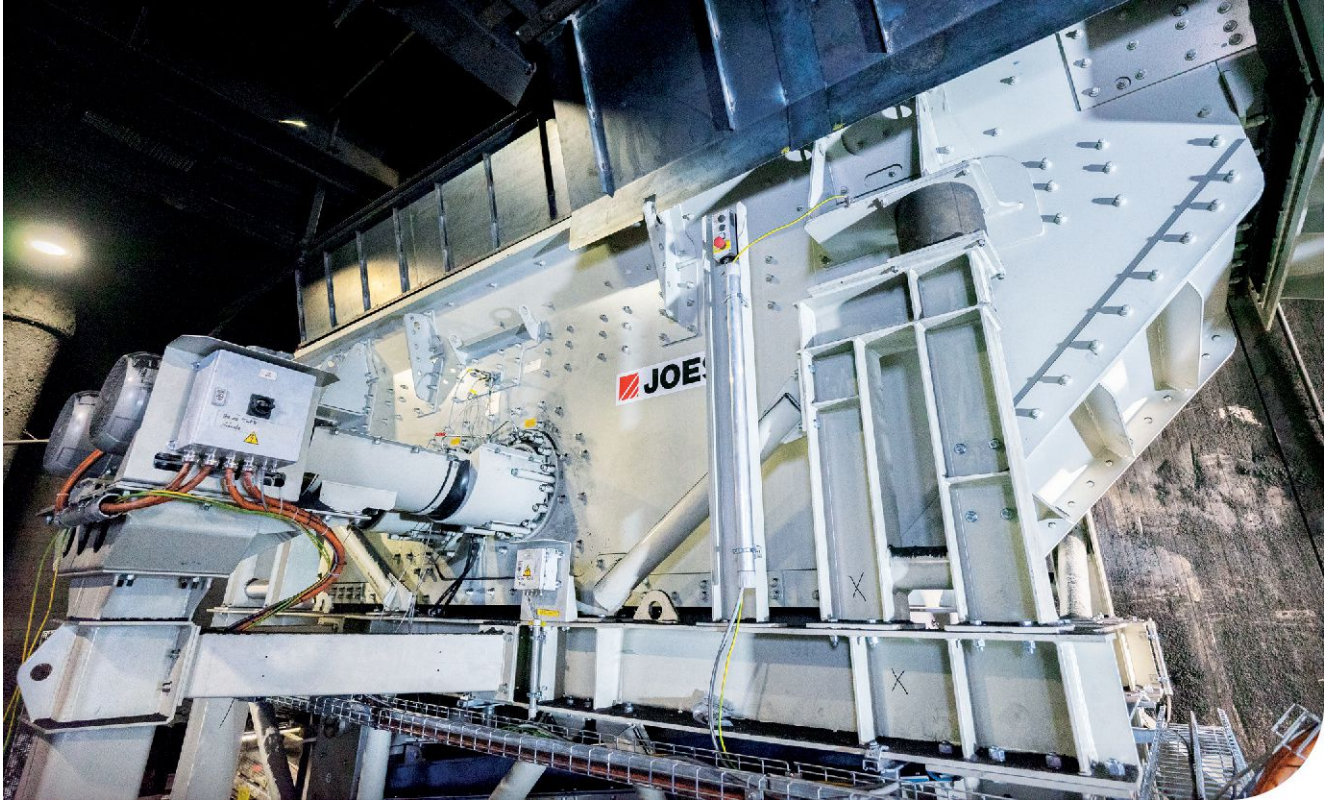
"It's the operators against their own maintenance personnel within a foundry—that's the biggest problem for us," said Lumpp. "If they aren't communicating with the maintenance guys or neglecting the equipment, mistakes like overloading and damage can happen."

To avoid overloading a vibratory conveyor or shakeout system, operators must control the rate at which material enters. Methods include regulating the infeed, programming automated safety shutdowns, and matching the equipment to the job.

Letting small maintenance issues go unaddressed is another common mistake. "Temporary 'band-aid' repairs may keep equipment running in the short term, but they often allow the underlying problem to worsen," said Hutchens. "Addressing issues early typically results in lower repair costs, less downtime, and longer equipment life."

HOW MANUFACTURERS HELP REDUCE DOWNTIME

To help operators avoid damaging machines, some manufacturers have added technology that assists operators in monitoring equipment performance.



The JOEST TWFE variable angle shakeout is designed to withstand the harsh conditions in foundries, offering flexibility with changing sand to metal ratios.

For example, on JOEST "FSM" conveyors, the control system will monitor the speed and stroke of the unit, and if something happens, such as a reactor spring break, the control system will automatically adjust the speed and stroke of the unit to protect the rest of the machinery from failing. "This allows the customer to continue running the equipment until a 'preventative maintenance shift' where a maintenance technician can inspect and replace any failed components," said Lumpp.

General Kinematics also offers several monitoring and control systems designed to improve equipment reliability and support proactive maintenance on both shakeout and conveyor systems.

Stroke monitoring systems alert operators via high-stroke or low-stroke alarms when equipment is operating outside its designed parameters. Automated variable frequency drive (VFD) control systems continuously maintain the proper operating stroke, ensuring consistent performance even as material loading conditions change.

In addition, Hutchens says portable Apex Wireless monitoring enables maintenance personnel to quickly collect vibration and operating data during routine walkthroughs, helping identify developing issues before they become failures.

In addition to a monitoring system that collects data from the machine and automatically adjusts to prevent damage, Conveyor Dynamics focuses on building heavy-duty machines. "We strive to overbuild all of our machines," said Fouts. "If they need something that's capable of 20 tons an hour, we'll rate it at 20 tons an hour. But we'll build something that could be capable of 60 tons an hour. In this industry you can almost never be heavy-duty enough."

Ease of maintenance is another consideration. JOEST vibratory conveyors and shakeout systems use a modular design to make part replacement easier. "Our shakeout decks have retained locknuts so they can easily be changed out by a single technician from the top instead of having a person climb into a pit from underneath," said Lumpp. Bearings for drives can be quickly removed and taken into a clean work environment, reducing downtime. JOEST conveyors also utilize "Tilgers," which is a single unit assembled with reactor springs and a balancing weight that eliminates any dynamic forces going into a foundry's foundation. "These units can be easily unmounted and exchanged if there are issues to reduce downtime," Lumpp added.

THE PAYOFF OF BEING PREDICTIVE

At Mueller's Decatur plant, a team of 25 hourly technicians, supervisors, and programming engineers keep the brass foundry up and running, including Reliability Engineer Tim Oller and Maintenance Manager Ed Smith. Oller is responsible for reviewing the data and the analytics from the company's predictive maintenance software system (Tractian), while Smith manages the personnel.

"We're not relying on a maintenance guy to walk by a machine and happen to see something's wrong," said Kerestes. "It's always collecting data on those critical assets."

But along with data collection, the Tractian system also uses AI to offer suggestions to maintenance personnel.

"Just collecting data and kind of sticking it in the computer—that's nothing anymore," Kerestes said. "That really doesn't have any value. But what our system does is it looks for those variations and when it sees an abnormality or sees something going out of control, it's proactively sending us alarms. Not that the system is down or failing, but that the KPIs that it's measuring are showing variation, and that variation is most likely a precursor to a failure."

The system also offers suggestions on



A manipulator picks up castings off of AFS Corporate Member Conveyor Dynamics' shakeout system.

where mechanics might want to look.

"To predict and prescribe actions—that is the differentiator," Kerestes added.

Using the system's suggestions, the maintenance team can take the asset down during a non-production shift and do repair work in a planned and time-optimized manner.

"It's very difficult to constantly monitor a shakeout system, because they're always moving and it's tough to know if you're going to have failures in between your scheduled PMs," said Kerestes. "And by switching to a predictive system you can immediately recognize and be alerted to avoid a failure."

Oller believes the system is more than just a one-for-one replacement for human eyes and ears. It has proven to be an upgrade.

"Even if we knew what we were looking for, there were still some cases of imminent failure that we could not see or hear because it's hard to sense a 10-degree change in temperature or a few decibels change in vibration," he said.

Kerestes says implementing the predictive maintenance system has freed up the maintenance team to do other preventative checks and higher quality checks because they are not worried about hitting PM compliance metrics on the machines that are continually monitored.

"It allows our maintenance team to put their efforts where they'll have the most impact," he said.

To measure the ROI on the system, Oller has tracked every incident and estimated the amount of downtime it has saved the foundry. From July 2025 to July 2026, a $100,000 investment in the Tractian system (cost includes the software, a rental fee for the sensors, and installation) has saved the foundry an estimated $1.3 million in downtime expenses.

"Almost any foundry could benefit from this or from putting in some predictive maintenance systems specifically around their conveyor belts, any bucket elevators, any shakeout systems, things like that," said Kerestes.

BEST PRACTICES

Manufacturers, distributors, and Decatur Foundry shared their best practices for keeping shakeout systems and vibratory conveyors running. From keeping spare parts on hand, to ensuring bolts are torqued to the manufacturer's spec and techs are using the right grade of hardware, maintenance comes down to the details.

Getting eyes and ears on the machines daily is also key—not just maintenance personnel, but operators who are typically near the machines all day.

"Operators are your first line of defense," said Morrison. "If something sounds off, if something is vibrating more than normal, help them understand that if they hear or see these things they should let the maintenance team know."

"Vibratory equipment often provides early warning signs of developing problems, such as loose hardware, broken components, or abnormal operating conditions, added Hutchens."

He also recommends that during scheduled shutdowns, a more comprehensive inspection should be performed. "This includes checking bearings, drive belts, fasteners, springs, and other wear components, along with a thorough visual inspection of the equipment for signs of fatigue, wear, or damage."

Lastly, foundries should consider the savings that could be generated by moving from reactive or preventative maintenance to predictive maintenance. Condition monitoring software today not only constantly monitors and collects data, but analyzes equipment health, predicts failure, and alerts the maintenance team.

As a result, foundries stand to significantly reduce the cost of downtime from their vibratory conveyors and shakeout systems. MC