HENDRIX PRECISION

WORTHINGTON STEEL

Worthington Steel's Journey to Reliability Excellence with Hendrix Precision Maintenance

How transitioning to a precision maintenance strategy not only enhanced equipment performance but also fostered a culture of continuous improvement, leading to long-term success

Managing costs, improving productivity, and returning on shareholder value have traditionally been areas of focus for most organization's annual goals and strategic plans. And, if those weren't challenging enough, adding sustainability efforts as an integral part of the overall strategy has significantly increased. The objective now for most industrial or manufacturing facilities is to operate maintainable assets in a cost-effective manner while minimizing unplanned downtime events and lowering their energy footprint.

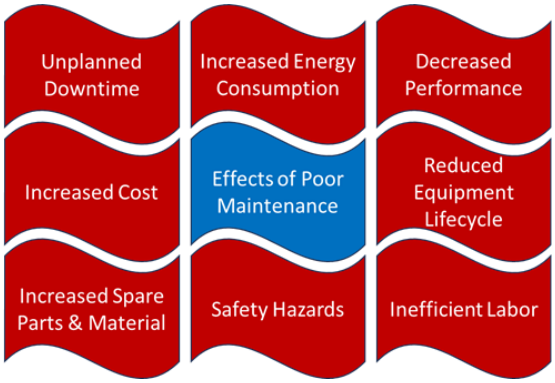
Worthington Steel is no exception. Recognizing improvements to their maintenance approach was an essential part of achieving these goals. Their strategy centered on an investment in a reliability-centered team with a mission to develop and deploy effective work management, optimize existing preventive maintenance plans, implement predictive maintenance technologies on critical assets, and "up-skill" the core internal maintenance team and external providers.

Jeremie Lieb
Worthington Industries

Transforming maintenance is never as easy as it sounds. The plans look good on paper, but changing the behavior from years of practice always proves to be a challenge. In fact, Jeremie Lieb, the Worthington Steel Maintenance Agile Team Lead said, *"We have a tenured team. They have been completing tasks in the same way for a long time and haven't questioned until now, whether it could be done better ".*

The sentiment shows how important it is not only to upgrade skills but show the value in changes or new methods. In manufacturing, the pressure for productivity and throughput is

high, making equipment reliability, energy consumption and equipment lifecycles critical to success.



Worthington Steel sought a training partner to help develop new behaviors for maintaining equipment and increasing the time between failures; thus reducing unplanned downtime. The team understood that to accelerate the transformation, they needed to change to their onboarding and skills-development training. This led them to Hendrix Precision Maintenance Services (Hendrix).

One of the key aspects of the Hendrix training is the balance between classroom and hands-on learning. Skills developed during hands-on practice are retained far greater than those covered solely in a classroom setting.

The Hendrix Precision Maintenance classes equipped the Worthington Steel maintenance teams with vital skills needed to achieve reliably sustained results. Hendrix's courses turn the classroom sessions into practical learning events with experienced instructors. Utilizing both operating and static machine simulators is an essential element in the training sessions. With this guided coaching, Worthington Steel participants learned how to disassemble components, correct common assembly errors, perform precision alignments, and most importantly, measure their results. The Hendrix team's experience and proven track record in skills development helps contribute to immediate and lasting asset reliability.

Worthington Steel's plan included an aggressive deployment of precision maintenance training. As of this writing, 43% of the company's workforce has completed the Hendrix's Skills I course.

At the company's Delta, Ohio, facility, 100% of the team, including contract labor and maintenance planners, has completed the course. They accomplished this in back-to-back weeks in April 2022. Having the workforce trained in a short period is challenging to operations, but set a baseline for performance and the ability to quickly measure effectiveness.

Hendrix outfits the available space with a classroom setting and a workspace for multiple simulators for conducting the hands-on sessions. Additionally, Hendrix staff's larger classes with two experienced instructors to ensure the best coverage for mentoring during the hands-on sessions.

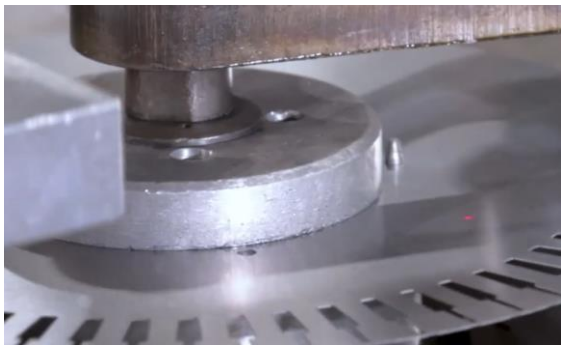
Prior to the class, the attendees on average had a fairly neutral perception about attending, not totally unexpected when embarking on a cultural transformation. However, upon completing the course, their view was much more positive (4.75 out of 5). When surveyed how often they estimate being able to use the skills learned, their responses were close to 80% of the time performing their normal duties. Finally, the attendees assessed the course with a rating of 9 on a scale of 10. The students began asking for advanced session as part of an overall continuous improvement and skills development plan.

Worthington Steel utilizes an EAM system to track downtime. The Hendrix's Skills I training took place in 2022. When analyzing the EAM data, both the number of events and the average duration of each event decline. The results at the Delta facility showed a 32% decline in downtime hours year over year and continues to trend downward into 2024.

Some of the veteran maintenance folks remarked “I realized the benefits almost immediately upon completing day one of the course.” (photo) Although the training greatly benefited the handling and closing of corrective maintenance actions, it also lent to the maintenance staff proving feedback on routine preventive maintenance tasks to ensure they were optimized and precise.

In addition to optimized maintenance work practices, the team began implementing a work verification/quality process with a Hendrix Precision Maintenance checklist to ensure best practices are followed and maintained. Changing the approach from the most senior to the newest members of the team ultimately pays dividends down the road.

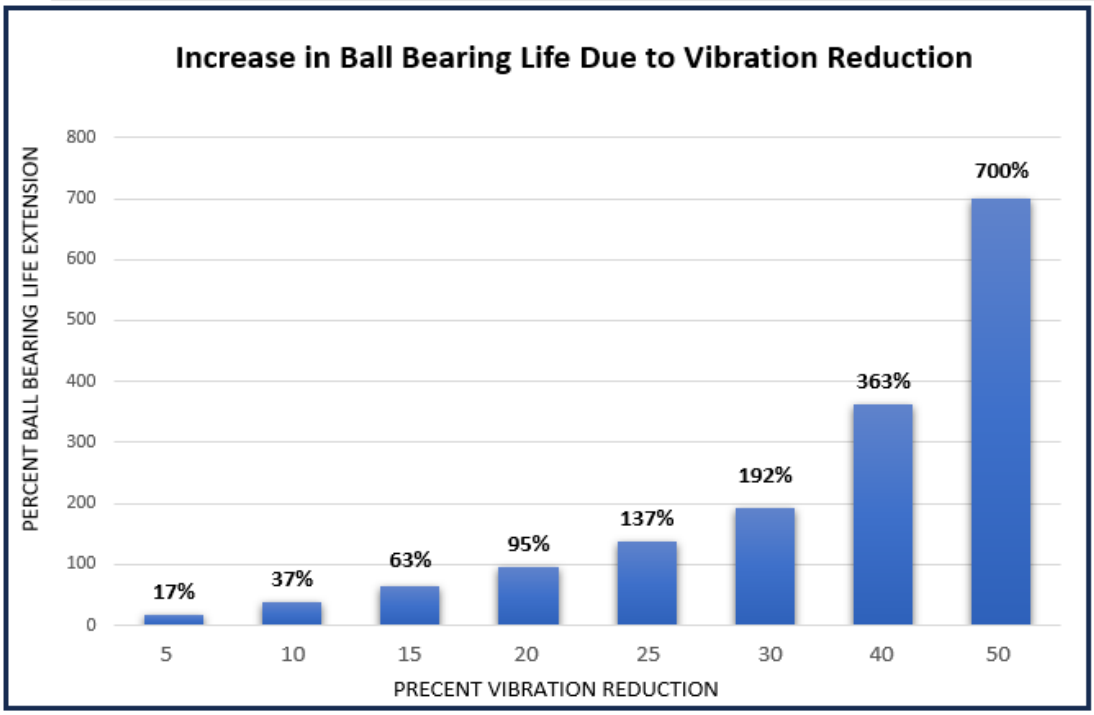
During the training, the relationship between precise maintenance and the elevation of destructive vibration in rotating equipment was established. In fact, during the hands-on sessions, pre- and post-vibration measurements were taken on the simulator to show the impact of precisely performing the maintenance tasks. This has led to requests from maintenance techs for post maintenance vibration measurements to be acquired to ensure high quality repair.



Worthington Steel, as part of the overall reliability strategy deployment, has implemented a vibration monitoring and analytic program. Each individual component of the overall strategy will have opportunities for success but when integrated together, a winning formula for improved operations is achieved. The vibration program provides automated and manually collected vibration on critical assets. The vibration data is then analyzed and reported, turning early failure indicators into proactive work orders. The

understanding of how failure indicators relate to the potential lack of precision has provided a quality feedback loop for the maintenance team. The effect that precision maintenance practices have on eliminating failure patterns from occurring repeatedly has become evident. Reducing equipment vibration and maintaining the asset precisely will result in a corresponding reduction in energy consumption.

The Worthington Steel reliability program has helped reduce repair costs, and has improved equipment availability, leading to increased throughput and productivity.



> ***"Lowing the overall vibration of any machine with bearings in it, you will exponentially increase the bearings life and thus the machine's life"***
>
> *-Dr. Wernher von Braun*

Data in chart from NASA study (not Worthington Steel data)

ABOUT WORTHINGTON STEEL

Worthington Steel (NYSE:WS) is a metals processor that partners with customers to deliver highly technical and customized solutions. Worthington Steel's expertise in carbon flat-roll steel processing, electrical steel laminations and tailor welded solutions are driving steel toward a more sustainable future.

As one of the most trusted metals processors in North America, Worthington Steel and its 4,600 employees harness the power of steel to advance our customers' visions through value-added processing capabilities including galvanizing, pickling, configured blanking, specialty cold reduction, lightweighting and electrical lamination. Headquartered in Columbus, Ohio, Worthington Steel operates 32 facilities in seven states and six countries. Following a people-first Philosophy, commitment to sustainability and proven business system, Worthington Steel's purpose is to generate positive returns by providing trusted and innovative solutions for customers, creating opportunities for employees, and strengthening its communities.

ABOUT HENDRIX

Since 2001, Hendrix Precision Maintenance has provided unique, hands-on training to equip maintenance teams with the vital skills and implementation strategies needed to achieve reliably sustained results. Turning the classroom sessions into practical learning events, our experienced instructors utilize running and static simulators as the essential elements in our training courses. With guided coaching, participants will disassemble, correct common assembly errors, and measure their results. The courses have been designed for all levels, craftsmen, supervisors, operators, engineers, and reliability leaders. Our experience has shown that precision maintenance skills development contributes to immediate, lasting asset reliability, extends equipment life cycle, and lead the process of eliminating unscheduled downtime, while increasing throughput and profitability.

Equally important, we teach leadership, operations, and maintenance, together with the critical implementation principles of step-by-step processes, proper communication, key metrics, install/rebuild standards, and the follow-up techniques, to ensure lasting change and, more critically, the quality expectations to be set for mechanics, supervisors and engineers.

CONTACT US

Hendrix Precision Maintenance
PO Box 5662 | Decatur, AL | 35603
Telephone: (888) 233-9777

Email: info@hendrixpm.com
Website: www.PrecisionMaintenance.com