

NORTH STAR STEEL ACHIEVES RECORD PRODUCTION WITH TRANSITION TO ASSET RELIABILITY

North Star Steel was founded in 1965, and began steel scrap recycling operations in St. Paul, Minnesota, in 1967. Now a wholly-owned subsidiary of Cargill, Incorporated, North Star Steel's operations currently include electric-arc furnace mini-mills in Beaumont, TX; St. Paul, MN; and Wilton, IA; a steel rolling mill in Calvert City, KY; and a grinding-ball plant in Duluth, MN. In a joint venture with BHP Steel of Australia, North Star/BHP produces flat-rolled steel in a mini-mill near Delta, OH.

The Situation

Like many asset-intensive businesses, North Star Steel (NSS) recognized asset reliability as a crucial strategic component of its long-term business plans. But the road to achieving high levels of reliability had many stumbling blocks:

1. CMMS investments that captured lagging equipment condition data, but did little to improve results.
2. Condition monitoring tools that provided current equipment condition data, but overwhelmed the then-present maintenance process.
3. An aging maintenance workforce whose members were very knowledgeable and skilled at what they did, but who would soon retire and take their knowledge and skills with them.

NSS long-ago adopted a Computerized Maintenance Management System (CMMS) in an attempt to reduce unplanned production downtime, track asset performance and reduce maintenance costs. When the anticipated benefits were not realized, the company further introduced a number of condition monitoring technologies, such as infra-red thermography and vibration analysis. Overall, the result was a substantial increase in paperwork – with little or no increase in efficiency or effectiveness of maintenance

In addition, North Star Steel was looking at the imminent retirement of a sizeable percentage of its maintenance work force, a large number of whom were 30-year veterans. These employees, who took a great deal of pride in their work, were more than willing to pass their knowledge along to the next generation, but no procedures or tools were in place to systematically capture and disseminate this crucial information.

NSS management recognized the value of the systems and technologies being utilized, but also recognized the shortcomings. To address these deficiencies, NSS sought out and evaluated several software packages. Working with an Ivara Partner, HSB Global Standards Reliability Technology (HSBRT), NSS selected the Ivara EXP software solution. It was clear that the software, coupled with Ivara's WorkSmart implementation process, would enable North Star Steel to make gains in its asset reliability strategy, leverage

its investment in predictive technologies and CMMS, and help to capture the expertise of its aging workforce.

The Challenge

North Star Steel needed to prove to management and to the workforce that the Ivara solution was the answer they had been seeking to transition from a repair-based maintenance culture to a reliability focused culture. The challenge was to ensure, before investing, that Ivara EXP would deliver significant financial and business benefits. The company was looking for assurance that EXP would enable North Star Steel to:

- Predict and prevent unplanned outages
- Sustain a high level of production with fewer resources
- Capture the knowledge of retiring workers
- Easily share reliability knowledge across plants
- Drive ongoing reliability improvements
- Give North Star Steel a competitive advantage

The Solution

North Star Steel conducted a pilot implementation of the Ivara EXP reliability software along with a strategic program of education and mentoring to:

- Clearly demonstrate the financial and business benefits of EXP
- Overcome internal resistance to change
- Completely transfer all knowledge required to implement asset reliability, and ensure continuous improvement for the future

To demonstrate the value of EXP, and the ease and speed of implementing Ivara EXP, NSS authorized a pilot installation at the NSS mill in Beaumont, Texas. Beginning with check sheets already in use by maintenance and operating personnel, the implementation team quickly established that the Ivara software could consolidate and analyze the results of multiple condition data points to predict asset health and determine the right work to do to prevent failures. Operators and tradespeople found that using Ivara's standardized electronic check sheets on handheld devices increased the consistency of data collection, prevented common recording errors, and eliminated subjectivity of visual inspections.

The system quickly revealed that a significant number of inspection tasks were, in fact, adding no value to the maintenance process, so this manpower was reallocated to perform proactive work identified by EXP. The transition from reactive to proactive maintenance had begun without any additional resources and without resistance from the people doing the work. Buy-in was easily achieved because EXP was increasing job satisfaction. Maintenance and Operations were now working together to optimize the reliability of their assets.

EXP had, in effect, enabled North Star Steel to improve their maintenance process. They were able to scrutinize their asset maintenance programs more thoroughly and capture the knowledge of their aging workforce in EXP – before their maintenance experts retired. In addition, EXP provided a system to assess risk and focus on the most critical assets to realize value quickly. Significant financial benefits were quantified and used as the basis for the business case to roll out the solution to the other NSS mills.

The Result

Response to the Ivara EXP pilot was so positive and enthusiastic that NSS has since implemented Ivara's reliability solution at all four of its mills. The software is installed at a single location, accessed continuously by all four sites, so that reliability improvements in each location can be shared by all four sites. In addition to ease of administration, this visibility of success ensures that ongoing knowledge and reliability improvements at all four mills can be quickly propagated throughout the entire system.

The results have been dramatic.

- Since adopting Ivara's reliability solution, NSS's Kentucky mill is running consistently at top capacity and setting new production records for both quantity and quality of product.
- Time-based inspection hours have been reduced by approximately one-half, freeing Maintenance to perform proactive work identified by EXP.
- To-date, spare parts inventories have been significantly reduced.
- EXP has proved invaluable in demonstrating compliance with Occupational Safety and Health Administration (OSHA) standards in crane maintenance and operation. In fact, OSHA received the results so enthusiastically that NSS is now developing similar procedures to achieve equal approval from Environmental Protection

Agency inspectors with regard to process-water and air quality.

- The transition to asset reliability using Ivara EXP was accomplished at each facility within ten weeks. This rapid implementation approach is a further demonstration of the software's ease-of-use and the users' enthusiastic acceptance of the software to support a new, reliability culture within the organization. The ability to achieve this employee buy-in is especially critical in NSS's unionized environment.

In addition, Operations and Maintenance departments are now working together, optimizing equipment performance and making a direct contribution to the company's business goals.

Conclusion

Through this experience, NSS successfully removed a significant number of stumbling blocks to achieve higher levels of asset reliability.

NSS concluded that the way to make the CMMS successful was to define its role differently – as a work execution tool, not a general maintenance system. The CMMS is now efficiently managing the execution of the work identified by EXP. Instead of expecting a return on the CMMS investment, NSS has used its broader maintenance systems strategy to drive an even bigger return.

Similarly, the role of their predictive and condition monitoring technologies were redefined as specialized engineering tools to help create the picture of the health of the plant. EXP is the system that Maintenance and Operations are using, day-to-day, to utilize all of this data to manage the health of NSS assets and to identify the right work at the right time.

Finally, EXP enabled NSS to create a knowledge repository containing all of the equipment expertise of their experienced – and aging work force. Now, the maintenance program is captured in EXP and rules have been set up to trigger the right work based on an asset's current condition.

The role of EXP is to pull together all of these capabilities to achieve optimal levels of asset reliability and therefore drive business results. North Star Steel is meeting its business goals with a reliability software solution from Ivara that is simple to use, quick to implement and easily incorporates existing technologies.