American Metal Market

Big River mill smartens up with AI technology

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NEW YORK — Noodle.ai, a California enterprise artificial intelligence (AI) company, said it has provided technology to Big River Steel LLC, calling it the "world's first smart steel production facility."

The new Big River mill in Osceola, Ark., is equipped with AI systems to optimize maintenance planning, line scheduling, logistics operations and environmental protection, Noodle.ai said in a March 20 press release.

Big River chief executive David Stickler said the smart systems will help the mill shift its maintenance focus to probable need and away from a random, time-based rotation, in particular. Traditionally, mills operate under a regular maintenance schedule—such as weekly—for certain gear.

"When I ask why they do so, I am frequently told: 'That's the way we've always done it.' At Big River Steel, that's the wrong answer," Stickler told AMM on March 20.

"We are looking forward to challenging industry norms by mining the treasure trove of data that Big River Steel is uniquely positioned to collect and analyze," he said. "The use of artificial intelligence tools will allow us to identify mathematical correlations that we believe will allow us to drive costs out of the production process while at the same time enhancing the quality of the steel that we produce."

Stickler likens his smart mill to a driverless car that, on Day 1, doesn't know how to drive itself but over time learns more and more.

San Francisco-based Noodle.ai incorporated predictive AI, with its machine-learning algorithms, into an industrial operations platform known as "The Beast." President and chief operating officer Raj Joshi said The Beast leverages the accumulation of inputs to help a steel mill optimize production and maintenance.

"We are able to use sensor technology to track different variables—heat, pressure, mineral composition and wear and tear—and we can use our supercomputer to predict when that equipment will malfunction," Joshi told AMM.

AI and the steel industry "are a very strong fit" because "conditions vary quite a bit," said Chris Heuschkel, a Noodle.ai partner and client services specialist. As no two mills are the same, it's important to have customized data on site. Over time, the smart mill will maximize production, save energy and reduce waste and contamination. The AI provides tools to avoid premature and

unnecessarily expensive maintenance and replacement. It also acts as an early warning system to avoid fixing something too late, thereby warding off costly outages and accidents.

"Refractory panels are a huge area where we can take cost out," Heuschkel said. "They burn out quickly. (Some mills) have a recordkeeping book, and they might say it looks OK or it doesn't look OK."

On the logistics side, The Beast aids lead-time prediction and helps save money on transportation and storage at all upstream-to-downstream stages, he said.

"We even do a lot of work with intra-mill—how (items) are moved around within the four walls," Heuschkel said. "With the inbound raw materials and the outbound, it's a huge cost there, as you can imagine."

With sensors feeding data into a supercomputer, the mill operators have access to an ever-improving quantitative analysis telling them the optimal time for various functions. The Beast takes automation to the next level, and steel mills embracing it now are "on the front end of a megatrend," with AI becoming "the most significant differentiator by 2020," Joshi said.

"The more data you feed it, the better it becomes," he said. "The machine-learning algorithms can evolve without explicit programming. Their accuracy increases with time."