# AI Runs Smart Steel Plant

Arkansas facility was designed with AI in mind, boosting its efficiency

**By John Murawski**

An ultramodern steel plant in Arkansas is using artificial intelligence to help it become more competitive, as the U.S. steel industry looks for ways to lower costs in a global market facing slowing demand.

Big River Steel LLC's mill, which began operating in January 2017, melts scrap metal and produces steel for more than 200 customers, including four auto makers. Investors in the $1.6 billion facility in Osceola, along the Mississippi River, include Koch Minerals LLC; TPG Growth, part of private-equity firm TPG Capital; the Arkansas Teacher Retirement System and the plant's management.

The plant's AI system, designed by San Francisco technology firm Noodle Analytics Inc., uses deep learning and neural networks. It was designed to continually train algorithms on data captured by thousands of sensors.

The data can be useful in a number of ways, from spotting problems with production and quality to helping sequence the production of various grades and sizes of steel in the most efficient manner. The system can also help conserve energy consumption beyond what the plant gets per its utility contract, maximizing the amount of surplus power it can sell.

Big River Chief Executive David Stickler, 58 years old, is a veteran of the steel, mining and recycling



The Big River Steel mill has an AI system that collects data on equipment conditions such as pressure and temperature, as well as scrap-metal conditions, customer delivery schedules and electricity costs. PHOTO: BIG RIVER STEEL LLC

industries who attended a White House AI summit last year. He is also director at Global Principal Partners LLC, which invested in the plant.

Mr. Stickler said the "self-learning" mill is comparable to an autonomous vehicle in the technological advances it is ushering into the steel industry.

"We're using the best available technology and pressing that technology farther, we think, than anyone in the steel industry," he said. "Any future steel facilities that are built will try to capitalize on what we've done and replicate it."

The plant, which employs more than 500 people and produced 1.6 million tons of steel last year, is the company's only steel mill, though it is exploring building another facility.

In recent months, falling steel prices have put pressure on many domestic producers. United States Steel Corp. said last month that it would cut production by idling two blast furnaces, adjusting for a decline in demand from the manufacturing sector.

That environment is creating opportunity for newer plants with lower operating costs. Mr. Stickler told WSJ Pro that he believes Big River is millions of dollars a year less expensive to run than tradi-

The plant in Osceola, Ark., employs more than 500 people and produced 1.6 million tons of steel last year. PHOTO: BIG RIVER STEEL LLC

tional mills, thanks to the AI system and its potential to sell unused power. When demand for electricity is high, Big River can sell power at up to four times the amount it pays per its contract, Mr. Stickler said.

Some experts say Big River is at the cutting edge of steel mill technology.

It is the world's first steel plant designed to manage its operations with the aid of "artificial intelligence from the drawing board," said Ron Ashburn, executive director of the Association for Iron & Steel Technology.

Christopher Plummer, CEO of Metal Strategies Inc. in West Chester, Pa., advised the banks and investors backing Big River Steel. He said it is "the newest and highest-tech steel plant in the U.S."

The AI system collects data on equipment conditions such as pressure and temperature. It also tracks scrap-metal conditions, customer delivery schedules and electricity costs. The technology helps the mill produce different grades of steel with lower operating costs, a competitive boost.

Big River Steel spent much of 2017, its first year of operation, collecting and analyzing data, Mr. Stickler said. It took time to train the algorithms that are used to predict maintenance problems, because the machinery was new.

Mr. Stickler said that a typical mill might shut down for four hours once a week for maintenance, without knowing whether it is needed. But Big River's algorithms assess actual wear and tear, helping the plant avoid unnecessary downtime.

"Pretty soon you get an extra three weeks of operation a year," Mr. Stickler said.