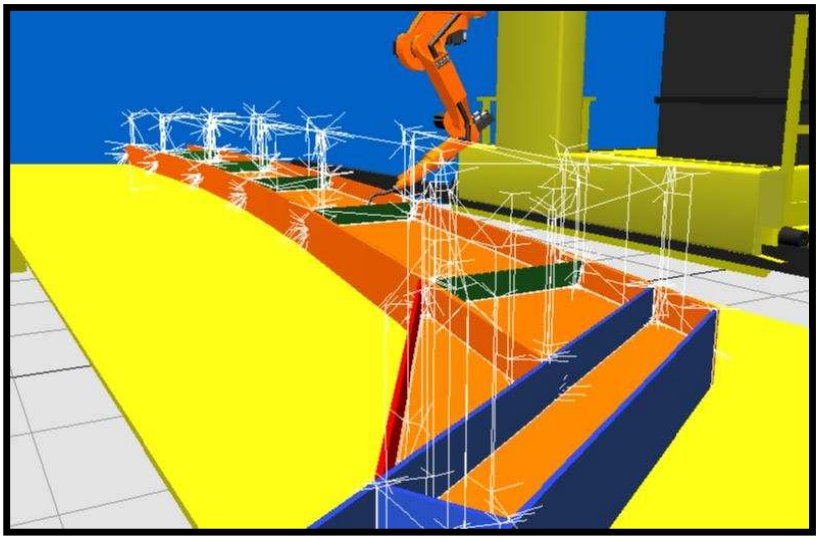
SmartTCP
Automatic Welding



AUTOMATIC WELDING FOR SMALL BATCH FABRICATION: A CASE STUDY

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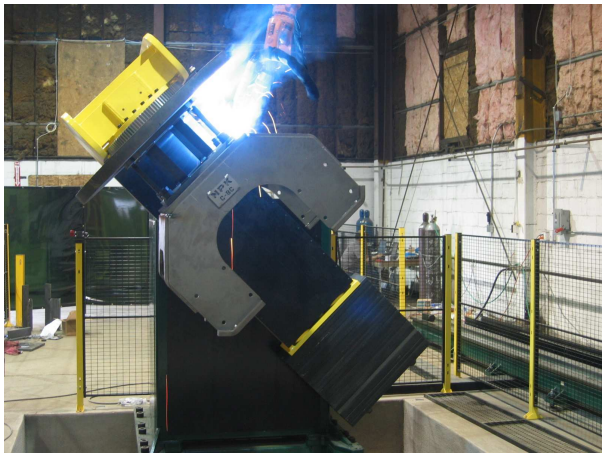
HEAVY MACHINERY EQUIPMENT MANUFACTURER'S WELDING PROCESS TAXED BY GROWTH

NPK Construction Equipment Inc. (NPK) a leading manufacturer of heavy machinery equipment for the construction, demolition and mining industries has been serving its customers since 1985. The company, based in Walton Hills, OH, manufactures attachments for equipment used in its customer's processes. In the past few years sales and production has grown exponentially and its manual welding process was experiencing growing pains. Its staff of master welders was being taxed by the increase in demand and the availability of expert welders was decreasing due to a worldwide shortage of welders. To address these issues NPK planned for a new manufacturing facility and began research on its options for automating the welding process. The company needed to find an effective automated welding solution to increase production, improve quality and enhance employee working conditions. With Its products ranging in size and shape and its inventory including multiple part numbers with minimal quantities per part this small batch production process did not lend itself well to standard robotic welding systems. The company needed a solution that would accommodate working with various part sizes and shapes and would be able to flexibly adapt to each part's welding requirement. After extensive research the company found few solutions that could handle their unique issues.

FAST AUTOMATIC PROGRAMMING NEEDED FOR COMPLEX FABRICATIONS IN SMALL BATCH PRODUCTION

"As we conducted our research, it was apparent that there was a lack of adequate fast automatic programming options that would minimize our down time," said Dan Tyrrell, president of NPK Construction Equipment Inc. "We needed a solution that could reliably weld all of our large complex parts quickly and accurately with minimal robot programming time required."



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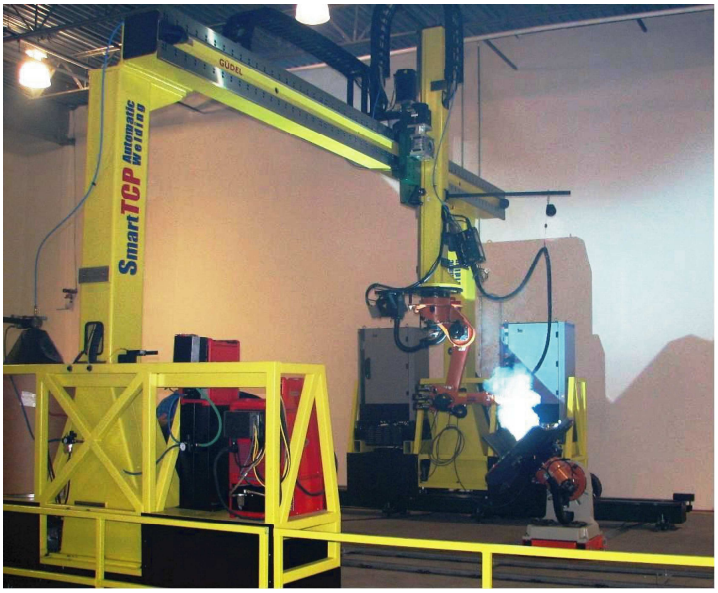
The company turned to SmartTCP of Farmington Hills, MI a leading supplier of automatic welding solutions for complex fabrications in small batch production and its system, the SmartTCP Robotic Welding Solution is the only comprehensive welding system that provides the ease-of-use, speed and quality NPK was looking for without sacrificing the flexibility that its welding operations required.

"NPK knew they needed to automate but with the company's high mix low volume production line, conventional robot cell configurations and robot programming wasn't an option as it was too complex and time consuming," said Efi Lebel, founder and CEO of SmartTCP. "SmartTCP's hardware and software components create a system for small batch production that allows for extremely accurate, flexible and reliable robot welding at a much faster rate than other robot techniques being used today."

FAST, ACCURATE & FLEXIBLE AUTOMATIC WELDING CELL



The SmartTCP Automatic Welding Solution automates both the robot programming and weld production. The system is a combination of hardware and software and features a flexible and modular working envelope that allows the manufacturer to weld any weld-able part. The hardware is composed of multiple industrial products from leading industry manufacturers including a gantry system from Gudel Inc., a robot system, external axis motors, control technologies and positioners from KUKA Robotics and welding power supplies from Fronius. The system's software is SmartTCP´s revolutionary software that automates the complex and tedious robot programming tasks. This combination of hardware and software creates a flexible and efficient welding cell.

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The system can be composed of multiple axes which gives it the flexibility to weld a high variety of parts which range in size, geometry and welding technologies. The base system is constructed of 9 axes (6 robot axes and 3 gantry axes) with additional manipulators of one or two axes as needed up to as many as 16 axes in two or more working zones. The system's best use is in an 11 axes configuration in each working zone for in-position continuous welding resulting in a higher quality and faster welding process.

The automated SmartTCP system helped NPK address the worldwide shortage of quality welding experts, save on labor costs and shorten welding times thereby significantly increasing manufacturing capacity and improving their bottom line. As one example, NPK saw the welding of one part reduced from 2 ½ hours using the manual method to a 30 minute weld time using the SmartTCP system. A new SmartTCP system is rapidly implemented and has a short learning curve. NPK's system was installed in three weeks and the company went into production one week later, making it possible for NPK to start realizing its benefits in very short order. Overall the system improved NPK's time to market, and increased production volume and quality.

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