

NX

Goodwin International

Specialty manufacturer successfully expands its capacity and capability to engineer high-value components using NX

Industry

Industrial machinery

Business challenges

Adapt production processes in order to diversify into new markets

Ensure the manufacturing security of high-value and large, specialist components

Keys to success

NX for product development, especially its user-defined event function to improve process and tooling capabilities

Highly customized post-processors and total process simulation

Results

Significantly expanded in-house engineering capacity and capabilities

Improved and sustainable best practices

Machining operations resolved in 3D safely and securely

Delivering exacting quality, on-time and to-price

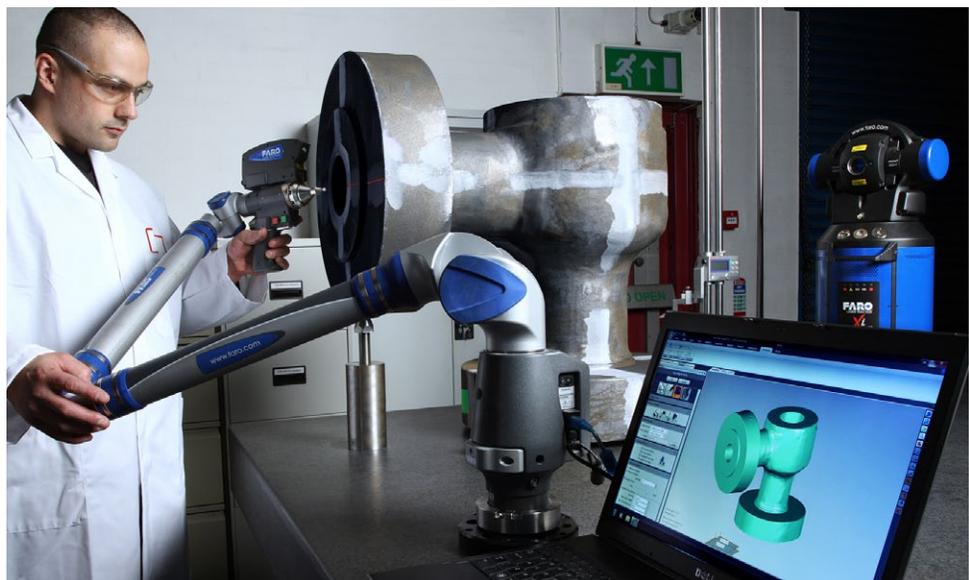
Considerable growth opportunities in new markets

Use of NX CAM increases control, flexibility and precision throughout company's machining facility

Strategy for growth

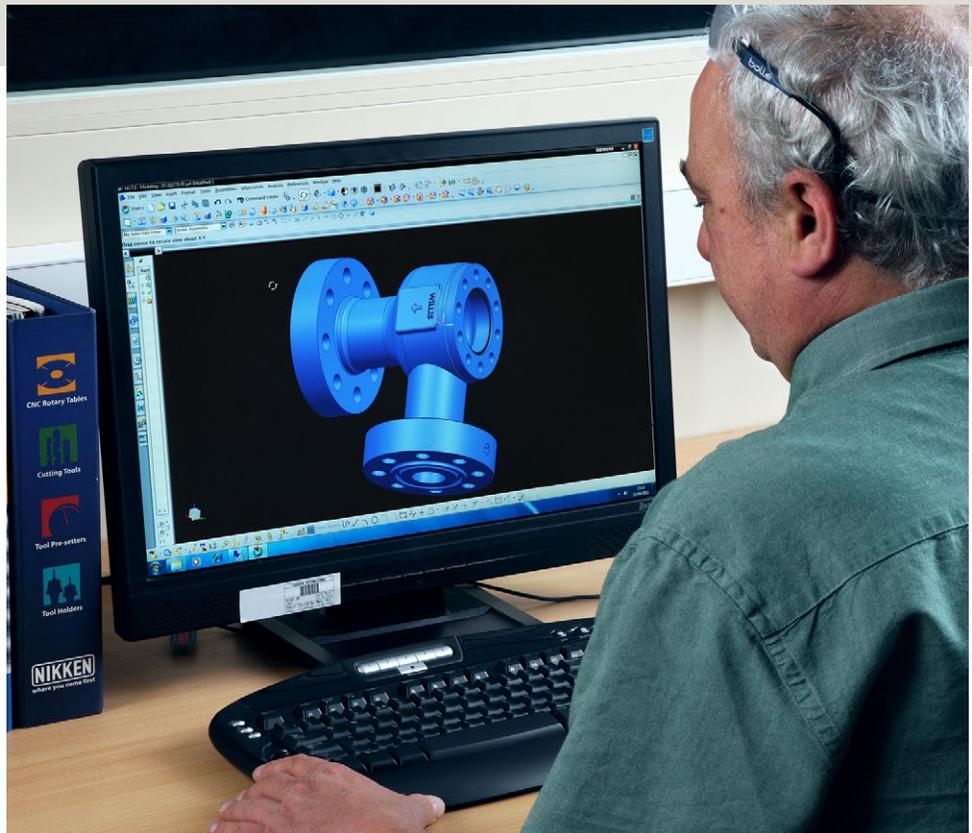
A supplier of machined castings since 1883, Goodwin International is the sixth oldest company listed on the London stock exchange. Although it has operated within the power generation industry for just over a decade, by 2011 Goodwin International had exported more than US\$200 million worth of power generation control valve units. The use of NX™ software from Siemens PLM Software is playing a distinct role in the company's growth and success.

For more than 20 years, the company has continuously strived to reduce cycle times and non-cutting periods by using computer-aided design (CAD) and computer-aided manufacturing (CAM) software. "In the past few years, we have experienced phenomenal demand for our services, and we've invested heavily in our facilities," explains Simon Ault, lead programmer in Tooling and Process Development at Goodwin International. "We now have state-of-the-art technologies and best-in-class tooling solutions, plus large CNC (computer numerical control) machining centers, and we have delivered several high-value, specialist engineering projects.



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Simon Ault
Lead Programmer
Tooling and Process
Development
Goodwin International



“However, to maintain competitive advantage, further advances in tool path and machine control were required. We temporarily outsourced our highly complex programming requirements due to existing limitations, but as the level and cost of this subcontracting began to grow, it became apparent that we would derive greater value and control if we brought this technology in-house. We therefore began to review CAD/CAM software as part of a deliberate business strategy to break into new, specialist markets and to improve our existing manufacturing processes.”

High-value machining centers

For Goodwin International, NX was the clear winner. “Not only does NX deliver highly advanced tool path control, it’s a user-friendly solution and it has a UDE (user-defined event) function that is critical for us,” notes Simon. “In our heavy engineering applications, it is quite common to deviate

from what would be considered the norm in machining terms. Not every user actually needs such functionality, yet Siemens PLM Software recognizes this specialist requirement for the control of highly customized and ‘unusual operations,’ and provides the solution.”

Goodwin International is assisted by specialist CAD/CAM supplier, TTL, a Siemens PLM Software partner. TTL designed the implementation and training process that enabled Goodwin to control the phasing out of legacy software and phase in the full 3D visualization of the machining environment. Simon explains, “We began by building models of our three largest machining centers, the high-value and high-risk areas of the machining facility. TTL then wrote highly customized postprocessors to convert the output from NX CAM into the required machine code.”

Zero tolerance for risk and waste

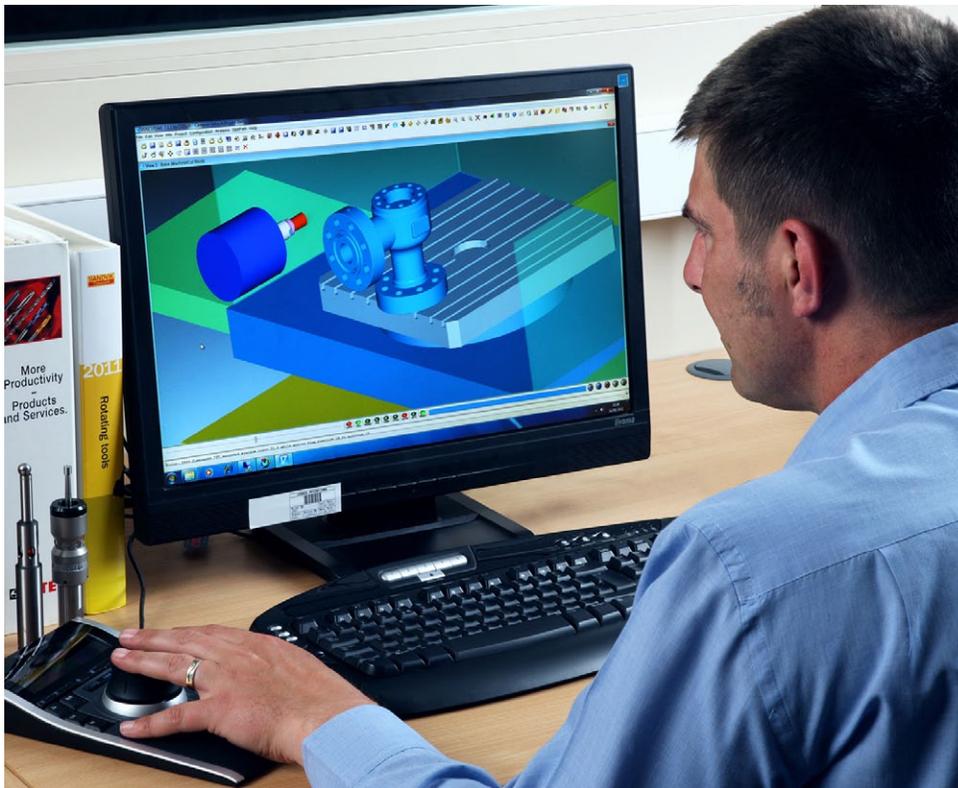
The new process begins when sister company Goodwin Steel Castings delivers the raw castings. These are marginally bigger than the final components to allow for finishing. Typically, laser scanning is used to reverse engineer the casting into a 3D model. With drawings as an additional reference, the scanned data is converted into a workable CAD format and imported into NX as a stock model. Users then begin to create the exact machinery environment in which the final product will be machined, which includes the most effective and efficient means of locating the work-piece on the machine table, plus all fixtures, clamps and tooling systems.

Machine tools and components can be extremely expensive; a single casting may be worth up to £250,000. Fully machined, its value can double. In addition, the lead

time for a replacement casting is lengthy. Using NX removes a significant amount of risk in the engineering bays that routinely handle such high-value items. They would be prohibitively expensive and time-consuming to replace, so there is a zero-tolerance approach to machining components incorrectly. "Here, 3D is much easier than 2D; it removes ambiguity and builds confidence through the manufacturing processes," notes Ault. "With NX, everyone can see the same accurate data through all the phases of manufacturing and this makes it much easier to achieve precision. Even though we are working in an environment where we cannot see inside the component locally, where the metal is being removed, or see inside closed machine tools, we have a high level of control. Using the 3D models generated via NX, we can simulate the machine tool movement."

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Solutions/Services

NX CAM
www.siemens.com/nx

Customer's primary business

Goodwin International provides project-based heavy engineering and manufacture of dual plate and nozzle check valves and submersible slurry pumps.
www.goodwininternational.co.uk

Customer location

Stoke-on-Trent
United Kingdom

Partner

TTL

"Siemens and TTL provide Goodwin International with the tools, knowledge and control of product manufacturing to compete in the present and continue with diversification and future growth."

Simon Ault
Lead Programmer
Tooling and Process
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Working with NX gives Goodwin International safe, secure and repeatable manufacturing processes, a fundamental requirement when delivering components that demand extremely advanced capabilities. On such projects, it is imperative that the tool path is safe and secure. Any issues would not only be expensive and problematic to resolve, but penalty clauses can be exacting. "The cost of missing one deadline could wipe out the profit on a whole project," says Ault.

New capacity enables diversification and future growth

During the first 18 months of implementation, Goodwin International successfully expanded its in-house engineering capacity by using NX to direct three of its CNC machine tools. Using the advanced functionality of NX has enabled the company to create even more capacity to adapt and improve.

"In total, we have 25 CNC machines and around 40,000 NC (numerical control) programs, so we confidently expect to see many more improvements over the coming months and years as we introduce NX across our entire machining facility," says Ault. "The open architecture of NX means that we can tailor it exactly to our most productive processes and create new custom capabilities. NX is the piece of the jigsaw puzzle that brings all our 3D technologies together; it's a key enabler and a driver for the future."

With NX, Goodwin International has further improved its ability to deliver exacting quality, on-time and to-price, and continues to bid on varied and complex manufacturing contracts with even greater confidence that it will meet or exceed customer requirements. "Meeting today's objectives was not enough; we had to be confident we have the right solution for all our future manufacturing challenges," concludes Ault. "Siemens and TTL provide Goodwin International with the tools, knowledge and control of product manufacturing to compete in the present and continue with diversification and future growth."

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