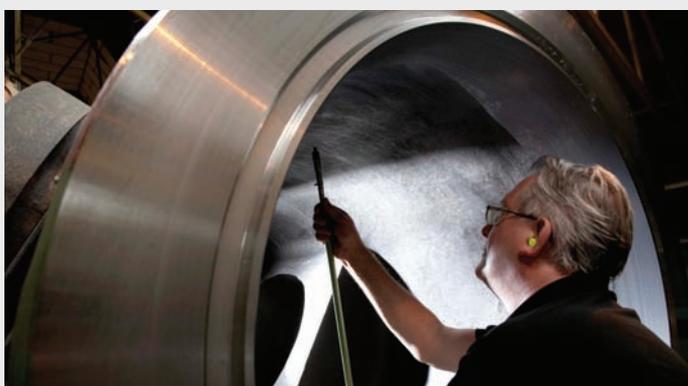




**SEIKI
SYSTEMS**

BEL Valves

Newcastle based British Engines Ltd (BEL Valves) is a successful, family owned manufacturing and engineering business established in 1922. Since then the company has grown from an outsourced manufacturing business to an £85m turnover specialist manufacturer of bespoke valves for the oil and gas industry. The largest business within the British Engines Group, BEL Valves employs 560 people and has undertaken an ambitious £15m investment project to double its manufacturing capacity to meet ever growing demand. One of the key considerations over this investment period is the increased capacity visibility and process optimisation provided by Seiki Systems.



BEL Valves specialises in bespoke, Engineer-to-Order valve solutions for extreme operating environments. Quality and reliability are absolutely paramount given the potentially serious consequences of product failure. The ability to meet deadlines and guarantee product quality is vitally important for BEL's customers with huge financial implications if delivery schedules are not met.

Business for the company is varied. With annual production rates that can range between 1800 and 3000 units, BEL Valves doesn't just manufacture on a large scale by volume. Whilst there can be up to 25,000 processes going on at any time, they also produce large end products weighing up to 20 tonnes. With a typical valve comprising of 20-30 manufactured parts, involving in excess of 50 process operations, lead times can vary between 24-56 weeks. Breaking this down into more detail reveals the process flow within BEL Valves and begins to highlight the challenges the company faces in optimising its four workshop areas containing CNC machines, a dedicated carbide coating area, assembly areas and test bays.

Given the physical size and scale of the operations at BEL Valves, visibility of what is happening and where, does create a real challenge. As with any manufacturing business, machine utilisation is critical. This is more than just knowing what machine is in use and when, it is understanding the underlying reasons behind this data, including the degree of human input involved at every stage. This is essential not just for controlling costs but also for being able to accurately allocate costs to orders.



Accuracy is Key

An accumulation of even small errors means inaccurate cost allocations, impacting the ability to accurately take on future orders. It also means time that isn't being effectively used. Given the scale of manufacturing at BEL Valves, they are looking at potential time savings measured in hours per operation and subsequent cost savings measured in tens of thousands of pounds by ensuring schedules are met.

Tim Maughan, Chief Manufacturing Officer explains. "An accurate understanding of our capacity is essential in a growing market because it has a direct impact on future plant investment decisions. With specialist plant assets costing up to £500,000 each and having lead times measured in years, we can't afford to buy too soon or too late."

Another challenge facing the company was ensuring adherence to the production plan. Machine Operators may be tempted to pick the easier jobs in their preferred order or in some cases, even decide to batch jobs they know are coming downstream. This introduces disparity between planned and actual work and creates added work in progress.

Prior to investing in the Seiki Systems solution, BEL Valves relied on a combination of its Avante Enterprise Resource Planning (ERP) system and its Advanced Planning and Scheduling (APS) package. While this allowed a basic level of works order progress monitoring, it involved a high degree of manual input. As Thomas Hodgson, Systems Production Engineer puts it, "We had some data but we couldn't trust it. Consequently we had regular manual inspections of workers and processes to check the validity of the data."

Adam Leggett, site Operations Manager outlines the key challenges that BEL Valves faces, especially in the context of ongoing business growth. "Because we are fortunate enough to be in a strong market, this puts pressure on optimising the use of our existing capacity throughout the business. This is not only to ensure we continue to meet customer schedules, but our customers understandably want assurances of our current and future capacity before placing orders."



Affecting a Culture Change

In 2012 BEL Valves committed to undertake an expansion plan to double the company's existing capacity and in the process identified a need for tighter integration, better information management, clearer data output and more robust hardware. Following Seiki's recommendations, systems were stripped back and a new network infrastructure implemented. Seiki industrial touchscreen PCs were installed as shop floor terminals to provide maximum robustness. From a software perspective, Seiki completely reworked their interface with the Avante ERP system, ensured it would run smoothly with BEL's APS system and then installed its Shop Floor Data Collection (SFDC) with WIP Booking, Machine Data Acquisition (Monitoring) and Jobpack DNC modules throughout the area.

Shop floor operators were now being driven by new 'work-to' lists delivered to each machine. The operator would pick the next job and if the required material was present, they would then download the relevant CNC program as well as be provided with video and text instructions including which tool to use. When they start the machine programme, Seiki then begins monitoring all the live operational data and handles any alerts resulting from stoppages etc. When finished, the operator enters the quantity of components at which point the Seiki software then has all the performance data relating to what happened and when.

Tim Maughan comments on the early indicators of success. "The most telling sign was the acceptance of the system by operators, the ease of use, increased robustness and flexibility of the system, all of which helped affect a culture change as the operators experienced for themselves how it was actually benefitting them." As well as bringing increased visibility and clarity to plant and human resources, it was at this stage that the cumulative benefits began to be realised. This was most keenly felt at management level which began to gain improved clarity of asset utilisation across shift patterns and at individual and combined machine shop level. Adam Leggett remarks, "Now I can look at one screen and see how every piece of equipment I'm responsible for is doing, in real time and from a trend analysis perspective. This in turn began to expose other areas that could benefit from fine tuning."

Such has been the early success of the Seiki system that it has led to a five year efficiency improvement plan being developed.



Integrated Manufacturing System

The system went live after a period of thorough testing, which included a lot of manual verification of processes and data to ensure consistency and accuracy. Proof of data stability and data accuracy was essential as it determines not only the ability to correctly allocate time and costs to existing jobs, they also feed into the ability to accurately quote for future jobs. Tim Maughan explains, "This meant that business charged hours were now based on Seiki alone. We were able to put our trust in Seiki because we had proven the data."

Individual shop floor operators now have access to more accurate information at the right time and the structure ensures that the correct workflow has to be followed, which improves efficiency. This extends to each machine shop level where high visibility monitors now display the real time status of every asset within the machine shop, meaning that supervisors can see at a glance what is happening and where any potential problems might be. Integrated alerts that automatically email supervisors when a machine has been idle for a specified amount of time reinforce this efficiency.

Improved visibility also extends all the way to senior management level, including the Board of Directors because the activity level of the entire business can be seen via the company intranet. "Now we can interrogate our capacity and workflow in real time" says Tim Maughan. "In a busy environment we are no longer reliant on historic data or for reports to be prepared. The information is there, in front of you, when you need it, where you need it." The system has helped to identify inefficiencies due to maintenance requirements and helped support the business case for additional investment. Such has been the early success of the Seiki system that it has led to a five year efficiency improvement plan being developed.

Looking to the future, BEL Valves has plans to continue rolling out the system throughout the company, beginning with assembly and testing. Given the nature of assembly, this has been an area historically difficult to derive accurate data from. It is anticipated that Seiki will greatly help in standardising procedures in this area which will generate considerable time and cost savings. The use of Seiki software in the testing area is of particular interest as being able to successfully video and monitor the entire test process could provide considerable benefits to the business and to their customers. Seiki is now at the heart of BEL Valves ambitious expansion plans. The final word goes to Tim Maughan, "We have moved from having an IT system providing limited visibility to having a fully integrated manufacturing system that the entire company trusts to provide real time information. We can see the machine and WIP status of every resource and the company as a whole in real time. Thanks to this we have the confidence to manage the challenges of our market and to ensure we meet the needs of our customers in terms of on time delivery, visibility and responsiveness."

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