Case Study

Seiki Systems software provides the 'backbone' for communications at AESSEAL, one of the largest mechanical seal manufacturers in the world. As the only major new entrant to this demanding marketplace in the past 40 years, AESSEAL offers industry leading products backed by a strong service philosophy and next day delivery for standard seals.

Employing over 1000 staff in 49 offices around the world and with an annual turnover of £65 million, the majority of the cartridge mechanical seals produced by AESSEAL are made in the UK. With a strong focus on customer service AESSEAL holds an enormous component stock level, typically six to 12 months worth. As the seal design is kept modular the parts can be rationalised to expedite final assembly. This brings enormous business benefits as Stuart Welsh says: "Our competitors will often quote 10 or more weeks for a replacement seal, whereas 70 per cent of our orders are delivered next day."

Seiki's Networked Manufacturing System was initially purchased as a way of getting the CAM programs for the seal components onto the shopfloor. Today, it is used to reliably feed CAM programs to the CNC machine tools via Seiki DNC to the machine shop. The software links over the company's WAN to shopfloor-based PCs, where the Seiki Systems HMI looks after a number of machine tools in a cell. The engineer will look at the job list and pull programs down as the machine and raw material becomes available. Stuart Welsh says: "For the past six years we have also used Seiki's monitoring solution to get information back from the machine tools, so we can understand the utilisation of the machine shops. The Networked Manufacturing System provides real-time data capture of the shopfloor utilisation for the 60 multi axis turning and milling CNC machine tools we operate in the UK. Even the manual and semi CNC machines used for material preparation, such as sawing, are part of the data capture loop."

The relays in the CNC machine controls are hard wired to show power and in cycle. "We then use the scripting within Seiki software to use robust logic functions to determine the machine status. We know the status of the program, if it has been downloaded, and if the job changes then the machine must be in set up. A cycle start will show the end of set up and cycle stop puts the system into waiting. The software's scripting language allows us, in conjunction with Seiki Systems, to write this logical sequence," Stuart Welsh explains. He goes on to say: "The software is very good at allowing you to link into other external systems, so it can hook into the product data management (PDM) and document management system, and even the ERP system via Seiki Systems front end. So the shopfloor has the visibility of the job required, the drawing file, the model of the part, and any supporting information – such as critical set up information. Tool lists are also shown along with visual aids to depict how the tool should be assembled and how it should look on the machine. This gives the engineer on the machine the confidence that the machine tool is set correctly and that the process will cut the material right first time."

AES Seal | Seiki NMS & Monitoring

Software Seals Production Efficiency

How AES Seal uses Seiki Systems software to plan and manage their production facilities as an internal profit centre.

Seiki NMS & Monitoring Features

- Fast and efficient shop floor communications
- Full audit trail of file transfers
- Simple and accurate automatic and/or manual data collection
- Factory wide distribution of work queues
- Remote live views of individual machine status and activity
- Graphic display of machine utilisation and lost productivity trends
- Link to other factory systems including ERP, PLM, PDM, etc.

Seiki NMS & Monitoring Benefits

- Creates a centralised factory knowledgebase
- Supports a lean systematic approach to the manufacturing process
- Eliminates inaccurate & time consuming manual methods
- Ensures only the latest manufacturing data is used
- Provides a dynamic, real time view of resource activities
- Supports continuous improvement strategies with real and accurate data
- Helps increase productivity and efficiency
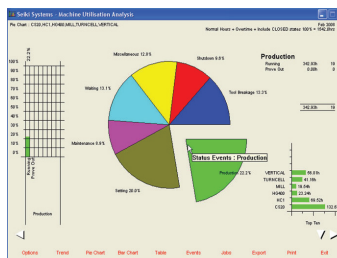
Machine utilisation pie charts can help identify reasosn for lost productivity

The shop floor has visibility of all the latest job information directly at the terminal

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Seiki Systems software also allows the machinists on the shopfloor to feedback information about how well the CAM program works. It interrogates the use of the CAM program so that any pertinent machining information is passed back to the CAM programmers, this may be something simple such as the need to reduce the feedrate slightly when machining phosphor bronze to avoid tool chatter. Stuart Welsh says: "It is good information that has significantly reduced scrap levels since it has been in use. For example, we machine specialist chemical resistant alloys for certain applications, such as Ferralium super duplex stainless steel or Hastelloy-C nickel-chromium-molybdenum alloy, and until you start to cut the material you do not get a feel for how well it machines in deep bores or internal undercuts and so on. This communication backbone is invaluable with new products being introduced."

Understanding the machine utilisation captured by the Seiki NMS system from a shopfloor management perspective is important to the future investment plans the company has. It provides hard data on machine capacity limits which become vital as more and more customer special seals with increased complexity and tighter tolerances are manufactured. The ability to interrogate data that has been collected in real-time directly from the shopfloor provides an enormous benefit. Essentially it provides a direct link between shopfloor activities and top floor production driven business processes, enabling the company to execute the manufacturing process more effectively and profitably.

As Stuart Welsh confirms: "With a growing business you have to justify additional or replacement machine tools, and we have recently acquired new machines to meet the demand for more complex components. A 9-axis Mori Seiki mill-turning centre allows both ends of a seal to be machined in one hit. This reduces the set up time because all of the tools are available and reduces the machining time as the part comes off complete. As we condense the time needed to get into production it becomes even more important to know how long the machine cycle actually takes for accurate overhead recovery – to know that we are making a profit."

The Seiki NMS software supports this functionality by providing an immediate, dynamic and visual picture of production activities by collecting data from and reporting on shopfloor processes. Automatic collection of productive and non-productive events occurring on the resources is captured, to build a record of each operating condition or status change as it occurs.

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The Seiki Solution

Seiki has over 20 years experience in the development and implementation of real time manufacturing systems that provide live production management information and visibility to maintain a controlled and flexible approach to the manufacturing process.

All the individual modules within the Seiki portfolio are available as stand alone solutions or are offered as an integral part of the Seiki Productivity Suite. Modules include:-

- Seiki Jobpack DNC
- Seiki NMS
- Seiki Monitoring
- Seiki Scheduler
- Seiki SFDC
- Seiki ERP

The modularity of Seiki software provides manufacturers with a flexible solution and progressive upgrade path. One of the key advantages is the ability to address your most critical areas first. Our aim is to work with you to secure your return on investment and support your business as it grows. We offer a complete service including planning, installation, implementation, customisation, training and after sales support.

All the data collected is date and time stamped (including the duration of each event) and can then be viewed as an event list or exported for further analysis.

Recovering overhead costs, such as the operational cost and depreciation of the machine tools, allows AESSEAL to accurately cost the components and therefore set the selling price of the seal. As the product range expands it becomes more important to cost accurately. Material costs are straightforward to measure. How time and, therefore overhead cost, has accrued is more variable with set up, the machining cycle, stoppages, inspection, all adding up to give a cost of manufacture. Seiki's Machine Utilisation Analysis module generates performance reports that are populated from data derived from the machine monitoring and shopfloor data collection. The reports are configurable so it is possible to undertake a detailed analysis of the entire shopfloor, an individual cell or even drill right down to the individual resource. It is then simple to identify trends in production, compare actual versus planned times and even see how many hours the machine tool has spent in maintenance during the month.

Stuart Welsh concludes: "The level of detail available enables planning and management of our production facilities as an internal profit centre, and is a key component in the delivery of 'Our Purpose': To give our customers such exceptional service that they need never consider alternative sources of supply."

Contact Us

Seiki Systems' suite of manufacturing execution software can be utilised for planning, controlling and improving the works order lifecycle - from top floor to shop floor - of any manufacturing company. Visibility and control of all stages of the manufacturing process is essential. Creating a leaner systematic approach can result in significant capacity and efficiency improvements that can lead to real cost reductions.