

# Information backbone

**Seiki Systems software provides the 'backbone' for communications at AESSEAL, one of the largest mechanical seal manufacturers in the world. *Machinery* reports**

**A**s the only major new entrant to the demanding mechanical seal market in the past 40 years, AESSEAL offers industry leading products, a strong service philosophy and fast deliveries.

Employing over 1,000 staff in 49 offices around the world, and having an annual turnover of £65 million, the majority of the cartridge mechanical seals produced by AESSEAL are made in the UK. The company operates three machine shops in the UK: Mill Close in Rotherham – predominantly machining components to top up stock levels in batches of 100 to 200; Mangham Road in Rotherham produces to customer sales orders – which may have plant-specific requirements; and Bradford which supports both these machine shops and also prepares the raw cartridge castings.

With a strong focus on customer service, AESSEAL holds a high 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 the company's Stuart Welsh, head of IT, 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."

## IN THE BEGINNING

Seiki Systems' Networked Manufacturing System was initially purchased as a way of getting the CAM programs for the seal components on to the shopfloor. Today, it is used across all three sites in the UK to reliably feed CAM programs to the CNC machine tools. The software links over the company's WAN to shopfloor-based



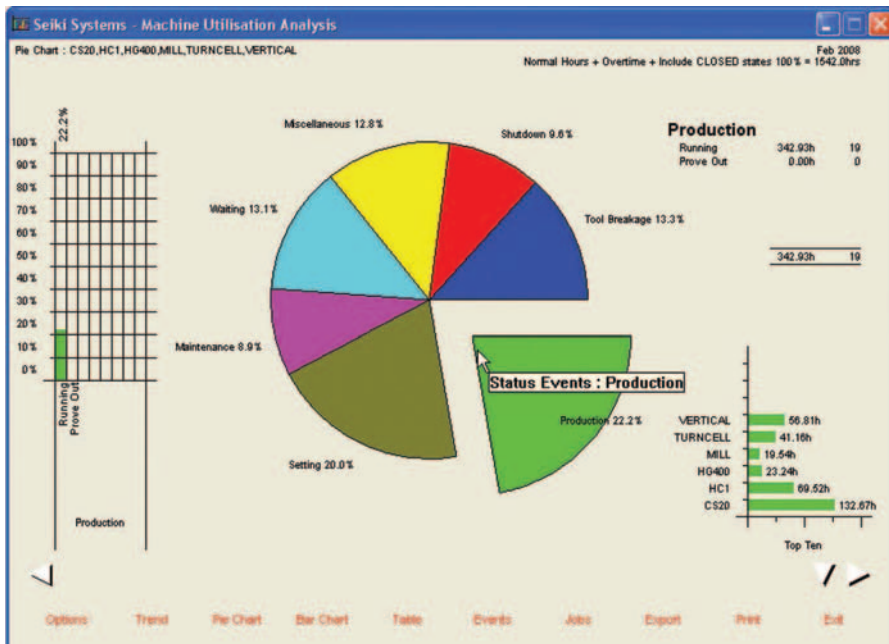
*HMI's located adjacent to machine tools offer visibility of job-related information*

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 become available.

But the company has moved on from the simple supply of programs to machines, as Stuart Welsh explains: "For the past six years we have also used Seiki Systems' 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 manual and semi-CNC machines used for material preparation, such as sawing, are part of the data loop."

The relays in the CNC machine controls are hard wired to show power



The machine utilisation analysis feature allows detailed investigation of specific time elements

and in cycle. "We then use the scripting within the 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," Mr Welsh explains.

**EXTERNAL LINKS**

"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 systems, 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."

Seiki Systems software also allows the machinists on the shopfloor to feedback information about how well the CAM program works. This may be something simple such as the need to reduce the feedrate slightly when machining phosphor bronze to avoid tool chatter. Mr Welsh explains: "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."

And understanding machine utilisation data captured by the Seiki NMS system is important to the company's future investment plans. 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."

**OVERHEAD RECOVERY**

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. 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.

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.

Mr 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." □