Keep on running

FSG Tool & Die has to keep its 'monster', an automated EDM cell, well fed to keep its operations running. Mike Nash went to witness feeding time at the Welsh toolmaker's factory

"It's all about feeding the monster," says David Holley, team leader for EDM and CNC jig grinding at FSG. And the 'monster' in this case is a recently installed EDM automated cell comprising Agie Innovation 2 die-sink EDM, linked by a System 3R Workmaster robot.

It's a term of endearment, as the cell represents a significant upgrading of the production process and a giant leap from previous manual operation. "Tasks that were taking 12 processes and over 30 hours now only take four hours to complete – and all unmanned!" says an enthusiastic David Jones, operations manager. And the effect is seen in export sales having risen to almost 20 per cent of the company's business, while customer tool lead times have been halved to six to eight weeks. But the ravenous monster demands constant feeding of work. "What you want is quantity on this machine", says Mr Holley. And this demanded a fundamental change in the way FSG operated.

The automated system comprises an Agietron Innovation 2 CNC die-sink machine integrated with a System 3R Workmaster robot. The Innovation EDM uses Agievision software, a control system that is self-regulating, automatically adapting to changes in electrode material and workpiece requirements. The operator can randomly load the robot with the required electrodes and workpieces, describe to the controller the work in hand and leave the integrated Agievision and System 3R software to take over and manage the work process.

The EDM machine accepts all electrodes and workpieces on holders and pallets, with measured position and size data automatically downloaded to the Agievision controller via a network. The Workmaster robot is in close proximity to a rotary carousel loaded with workpieces. Items are individually identified by microchips. The system can handle up to 300 variables live at any one time.

BEHIND THE HARDWARE

The FSG story is more than just investment in automation, however. The £6 million turnover company, in the small village of Llantwit Fardre, South Wales, specialises in precision machining, press

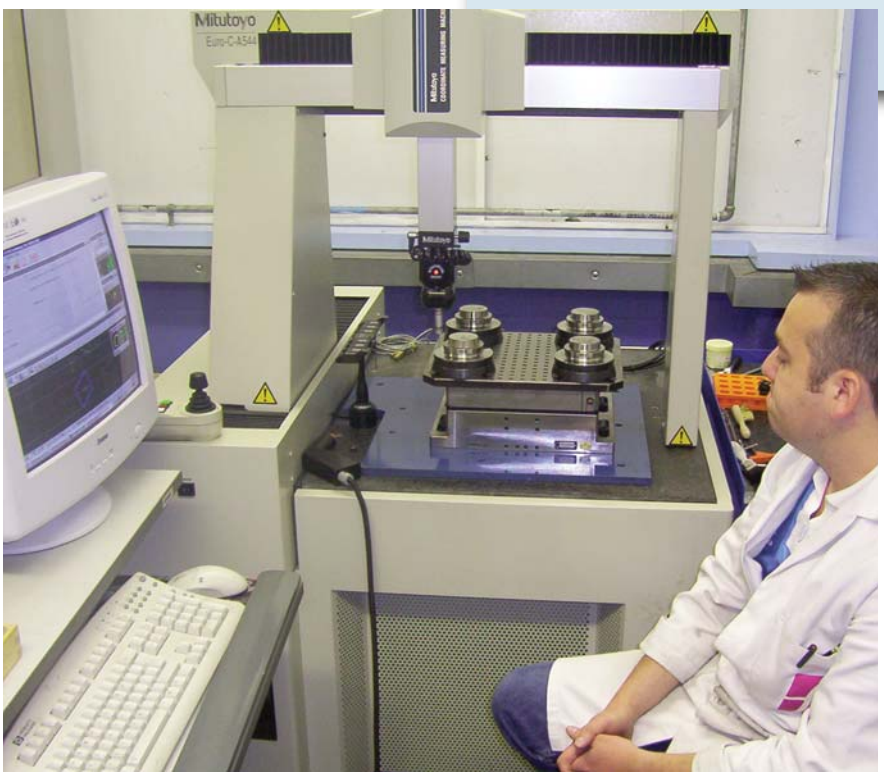
tooling and injection moulding across the automotive, metal and plastic packaging sectors with over 200 customers worldwide. The company exports around 20 per cent of its output and expertise.

"We can only maintain a solid business with sustainable growth by diversity and multi-market penetration," says managing director Gareth Jenkins. "During a visit by Rhodri Morgan, First Minister for Wales, he was surprised that only 20 per cent of our turnover was in the Principality." As part of its strategic development, FSG is committed to doubling this percentage. "The Welsh Development Agency, via its Precision Engineering Forum, has helped us identify around £5 million's worth of local potential business currently sourced outside of the EU."

Partly to boost local revenue sources, as well as to safeguard jobs, the Welsh Development Agency provided Regional Selective Assistance funding from the Welsh Assembly Government to the tune of £180 000 in support of the £700 000 investment in the new processes.

Mr Jenkins is certainly grateful for the support of the Assembly. "This was a major investment in very difficult trading conditions," he says, but FSG "wanted to be a centre of excellence for forging tooling." Key was the FSG Board and shareholders' total commitment "to the investment in pursuit of competitive advantage."

His enthusiasm for investment in automation is infectious. "Like everyone else we are in a global market that is becoming increasingly competitive." He acknowledges that "competitors in low labour rate economies have an advantage," which can be eroded by automation. Mr Jenkins believes that "the low rate economies will find it hard to make a financial justification for automation." Should they succeed, it comes back to the quality of the people,



About FSG Tool & Die

FSG employs around 70 people with a tooling design portfolio covering various consumer-led innovations such as yoghurt pots, Chinese take-away dishes and can ring-pulls. Its packaging industry client portfolio includes Crown Cork and Rexam. In metal packaging, its precision tooling is used to produce two- and three-piece cans, easy-open and plain ends for food, beverage, general line and promotional applications. Form, fill and seal processes are used to produce in-line food and beverage product multi-packs. The design, manufacture and refurbishment service covers moulds, sealing blocks and cutting stations.

For thermoformed packaging, FSG manufactures container lid tooling, moulds, punches and dies for precision cutting; with close tolerances on round, irregular and tabbed configurations. The company also offers design, manufacture and replacement parts services for press tooling, used in the manufacture of standard and smooth wall, round and irregular aluminium foil containers, for applications such as take-away food, frozen foods, desserts and airline meals. FSG also produces high-precision cutting tools for round, irregular and tabbed foil lids used to seal containers holding semi-liquid products.

It supplies the automotive industry with tooling, spares and technical support to clients such as Robert Bosch and designs and manufactures tooling for making automotive transmission components. One area of development is hot forging systems used in the manufacture of gearbox synchroniser components.

In addition to the automated EDM, FSG utilises CNC machine tools including turning, milling and grinding as well as four CMM inspection machines.

In 1998, FSG won the Gauge and Toolmakers' Association (GTMA) World Class Tool Maker's Award and, in 2002, the prestigious GTMA World Class Golden Globe Award.

says Mr Jenkins, which is ultimately reflected in the quality of the product. "Of course this is nothing new; it has been the same at FSG for over 40 years."

Mr Holley has been with the company for 22 years, although he doesn't look old enough. "What David doesn't know about EDM is probably not worth knowing," says Mr Jenkins with a smile. Certainly, the pride Mr Holley has in the process and the team is almost palpable. An entire area has been given over to the spark and wire erosion facilities. It is climate controlled and has negative airflow to reduce dust. "The whole area has been transformed", says Mr Holley. "The new extraction system really protects the process from contamination. There is no trace of graphite or grinding dust in here now. The temperature is a constant 70°C, and there are special tiles on the floor. Even the colour of the entrance door was chosen by me," he laughs.

WORKFLOW WORRIES

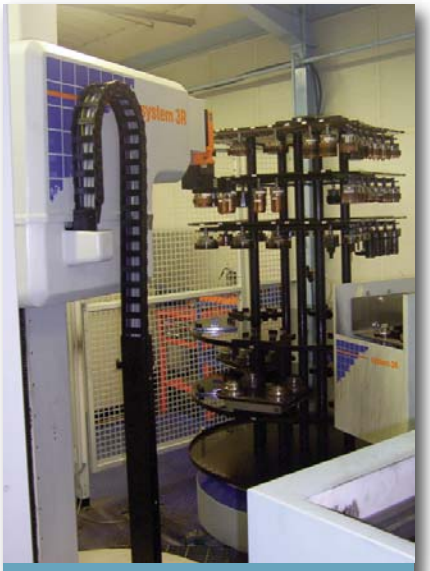
"The difficult bit is getting the workflow right", admits Mr Jenkins. "The reality is that you can't fill the machine all the time." Mr Holley and his team have regularly achieved 168 hours a week and he is a very popular person amongst his peer group at the weekly planned meetings. Their output is his input and it does lead to some lively debate. He is regularly chided by his peers for having the highest investment, pick of the apprentices and then wanting half the job done for him.

According to Mr Jones, "this is an extremely powerful tool that demands a totally different approach to planning of work load. As the process rarely stops, my team has to think and plan several days ahead. Our customers want shorter lead times, and this process – effectively planned and operated – supports this, we had to change as a manufacturing team."

FSG underwent a significant rethink of its working practices in an effort to achieve the best possible return on investment. And, in a short space of time, there has been a big change in working practices, and all the employees have "shared in the voyage of discovery". As Mr Jenkins says, "making the investment is one thing, but making it work effectively is the real key."

The alteration in set-up time is just one indicator of the significant change. "In the past a set-up could be anything from 30 minutes to four hours, now it is theoretically an hour, but in reality it is nil, as the process does not stop," says Mr Holley. The impact on output is obvious – "at one point that machine did not stop for four weeks," he adds. "For repeat jobs, the controller has stored all the necessary data and providing my colleagues supply electrodes it is business as usual."

The biggest change has been 'Remote Management.' David Holley and his team can now access the system from off-site via a laptop. It is now possible to alter work priority or settings almost at will. However, if there is ever a breakdown or a major change is necessary, there is, as Mr Holley says, no substitute for human intervention, and this can be at some very anti-social times. M



Toolmaking's news skills

"Quite frankly at times this learning curve was scary," admits Mr Holley. "Your computer skills need to be first rate, and you needed to back these with sound basic engineering principles." Mr Holley considers himself fortunate to have a "team of bright people", all of whom have come through the FSG Apprentice training system. "They have adapted to the extra responsibility and they understand that mistakes can be very expensive. This has not affected their performance at all."