

Precision sub-contract engineering: process improvement through automatic part setting



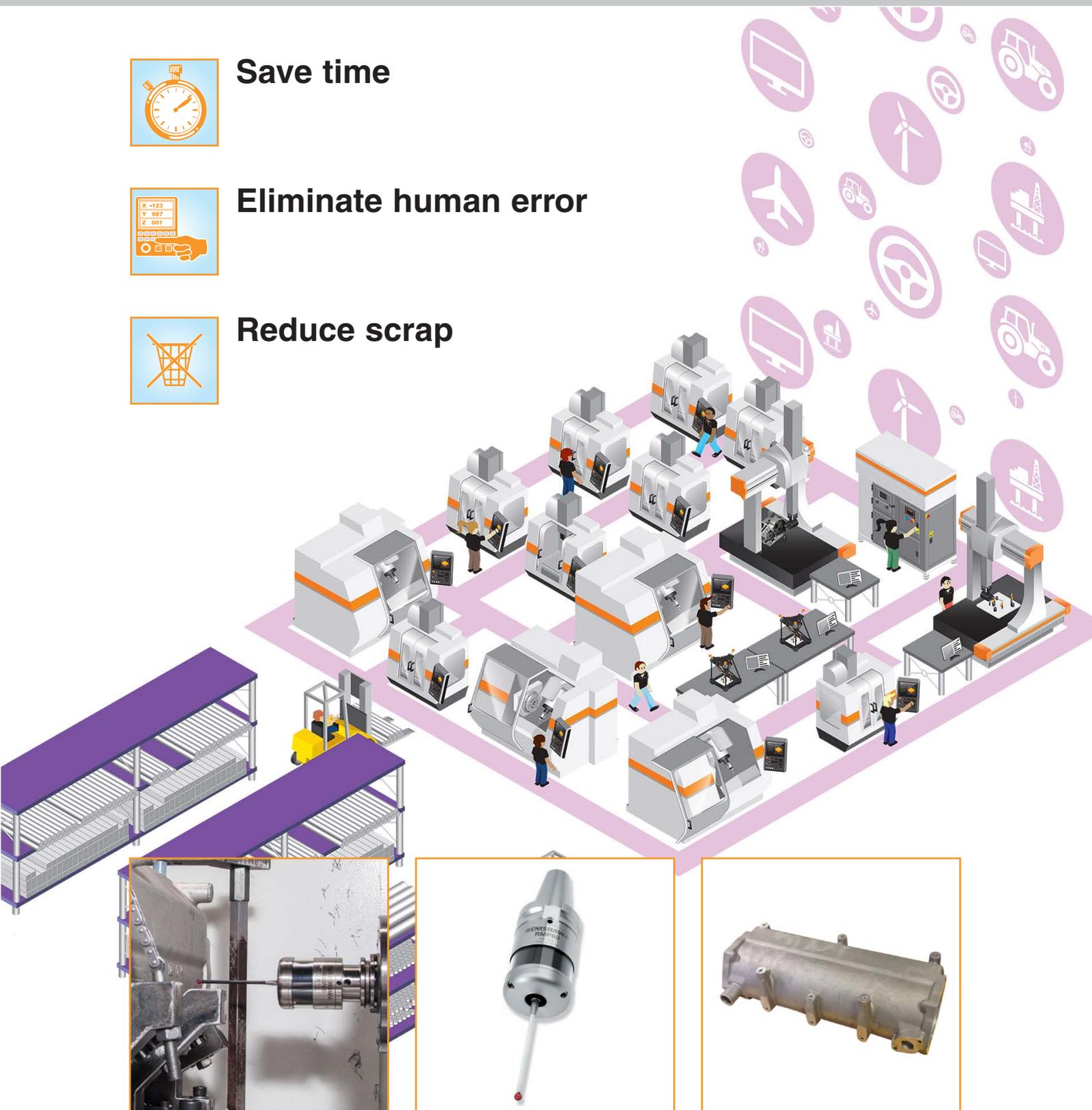
Save time



Eliminate human error



Reduce scrap



Overview

Company information	Quality Engineered Products Ltd is a precision engineering and machining sub-contractor.	
	The company is based in Cinderford, UK and was established in 2002.	
	Machining capacity is targeted at sectors including aerospace, marine and automotive.	
Products and services	High technology multi-axis CNC machining capability specialising in light alloys, but experienced in most materials.	
Industry accreditation	AS9100C	ISO9001
Company objectives	To provide a service that meets and exceeds customers' expectations on price and quality.	
	To reduce product cost and maximise customers' competitiveness.	
	To grow its business on the back of the level of service it provides.	

Process

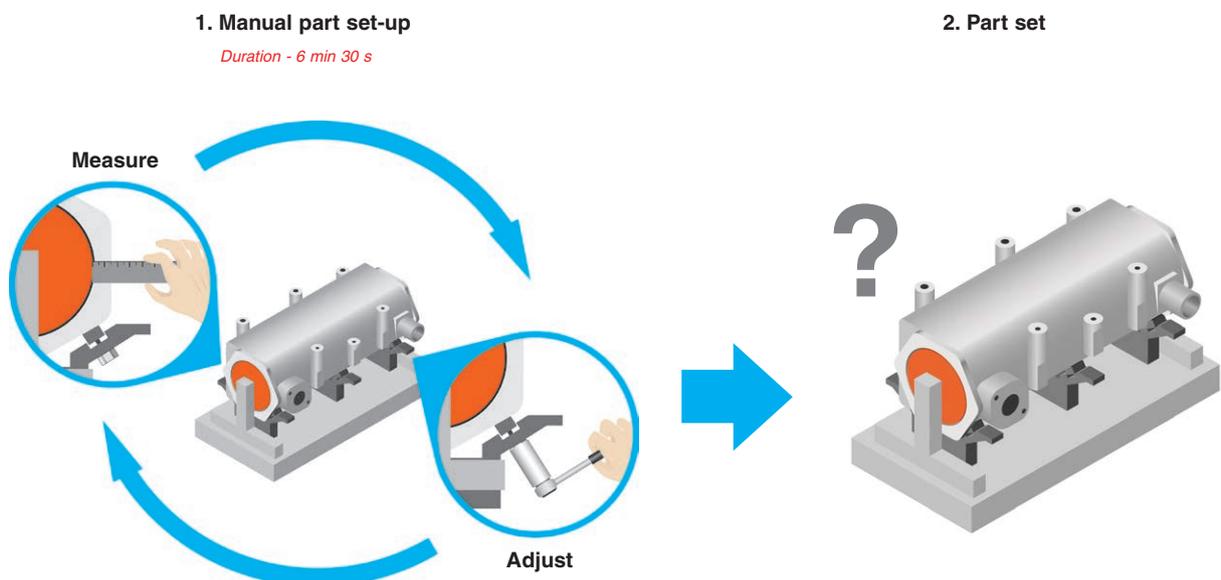
A wide range of products are manufactured using a variety of machining centres, including a Mazak Nexus III Series horizontal machining centre and Mazak Integrex i-200 multi-tasking machine.

Low to medium volumes, with 50-off being a typical batch size, result in the need for multiple set-ups during a normal working week.

Challenge

1 Eliminate human error and reduce scrap

The company had a recurring requirement to machine a range of aluminium sand-cast components in five different designs, typically in batches of 50-off. The fixtures and methods used to set the castings varied due to the sand casting process, with each set-up carried out offline and requiring a high degree of operator skill. Each part set-up took between 6–7 minutes; this time-consuming manual process unnecessarily tied up a skilled operator, yet still resulted in unacceptable scrap rates.

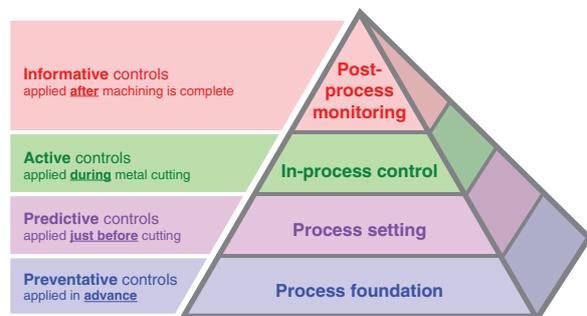


Process considerations

Renishaw engineers considered key elements within Quality Engineered Products' process and production stages of manufacturing using Renishaw's **Productive Process Pyramid™**. This framework is used to identify and control the variations that can occur at key stages of the machining process.

For more information, please visit the **When do I probe?** section of the Renishaw website:

www.renishaw.com/whendoiprobe



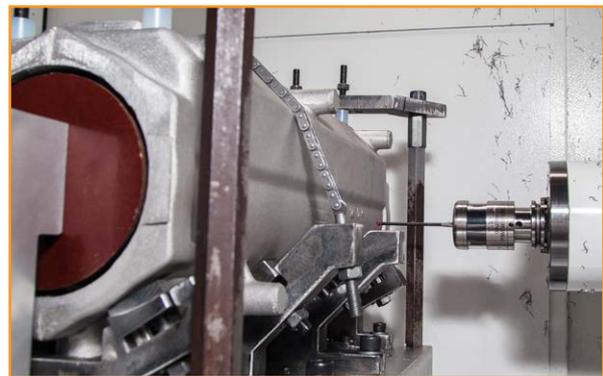
Productive Process Pyramid

Solutions

Manufacturing process focus: **process setting**

Focusing on **process setting**, Renishaw engineers have introduced measures to dramatically increase productive time and improve product quality.

QEP introduced two Renishaw part setting systems to its machining process. Renishaw RMP60 and RMP600 probing systems have enabled a fast, automated, on-machine process which has generated a time saving of between 70-80% per component set-up. The process is more reliable and scrap has been reduced by 25%.



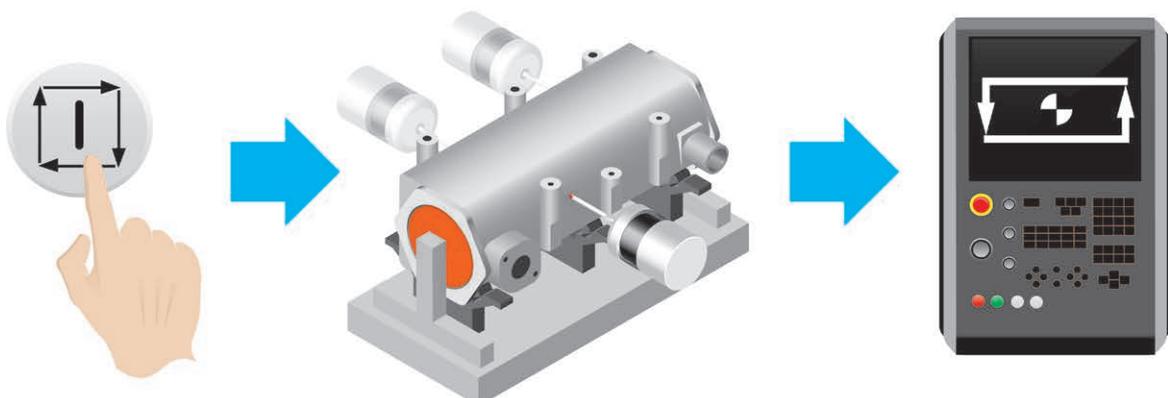
Automatic part setting using the RMP60

1. Cycle start

2. Automatic on-machine part set-up

Duration - 1 min 30 s

3. WCS automatically updated in the CNC control



Results

These charts provide a typical illustration for this industry application where probing has been introduced.

Reduced part set-up time

		Without probing	With probing	Saving
	Time/ part set-up	6 min 30 s	1 min 30 s	5 min
	Part set-up time/year (5400 parts)	585 h	135 h	450 h

Eliminated scrap caused by manual part setting errors

		Without probing	With probing	Saving
	Scrap rate	Possible	Eliminated	100%

Summary

The fast, automated, on-machine process enabled by Renishaw's RMP60 and RMP600 probing systems has allowed QEP to make dramatic savings in component set-up time of between 70-80% per component. The process is more reliable and scrap has been reduced by 25% as a result of these part setting systems.

Additionally, the new capability has allowed the company to:

- Increase confidence in the accuracy and reliability of their results
- Reduce scrap and rework
- Maximise productivity and efficiency

Contact

To find out how you could benefit from our process control solutions, contact us today – find your local office at www.renishaw.com/contacts

Customer comment

// We looked at the existing process and realised that we could release a significant amount of time by probing the part once it was transferred into the machine. It's here that some would balk at the machine downtime as we now spend between 60 and 90 seconds probing before machining starts, but we have given the operator over five minutes back to do other things, and again we have eliminated any potential for human error from the process which, in part, is helping to reduce scrap by 25%. So, those few seconds we spend probing the part for alignment are fully justified.



Quality Engineered Products Ltd (United Kingdom)

Best practice

Productive Process Patterns™ from Renishaw provide guidance on best practice and the implementation of a wide range of probing solutions.

For more information regarding job set-up and other applications, visit www.renishaw.com/processcontrol



About Renishaw

Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Products include:

- Additive manufacturing and vacuum casting technologies for design, prototyping, and production applications
- Dental CAD/CAM scanning systems and supply of dental structures
- Encoder systems for high-accuracy linear, angle and rotary position feedback
- Fixturing for CMMs (co-ordinate measuring machines) and gauging systems
- Gauging systems for comparative measurement of machined parts
- High-speed laser measurement and surveying systems for use in extreme environments
- Laser and ballbar systems for performance measurement and calibration of machines
- Medical devices for neurosurgical applications
- Probe systems and software for job set-up, tool setting and inspection on CNC machine tools
- Raman spectroscopy systems for non-destructive material analysis
- Sensor systems and software for measurement on CMMs
- Styli for CMM and machine tool probe applications

For worldwide contact details, visit www.renishaw.com/contact



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