

In-house metrology increases machine tool uptime by 20%



Customer:

Omsk State Technical University, Russia

Industry:

Scientific, research and analysis

Challenge:

Maintaining machine tool accuracy and uptime in an academic setting.

Solution:

Check and maintain CNC machine tools with XL-80 laser and QC20-W ballbar systems.

Overview

With machine tools resources failing outside of their warranty periods and 3-week long waits for external service engineer visits, Omsk State Technical University had to act quickly to protect its teaching, research and industry support services. The introduction of Renishaw's XL-80 laser interferometer and QC20-W ballbar systems did more than just provide the technical solution the University needed.

Background

Located in the Western Siberian region of Russia, Omsk State Technical University (OmSTU) was established in 1942 and is regarded as one of the country's foremost research-led scientific teaching institutions, with strong links to local industry.

In 2008, OmSTU launched a dedicated engineering resource centre equipped with a wide range of precision CNC machine tools. The centre was to be used for student teaching, the research activities of university staff and supporting local industry with manufacturing solutions and professional development programs.

Over a period of a decade the centre expanded rapidly to include a variety of different state-of-the-art CNC machinery: EMCO's Concept Turn 450; Okuma's 3-axis and 5-axis machines and Genus machining centre; and DMG MORI's DMU-50 5-axis vertical milling centre and CTX Alpha 500 universal turning centre.



XL-80 laser interferometer



QC20-W ballbar system

Challenge

OmSTU, like any other organisation investing in high-value CNC machinery, has the assurance of an extended purchase warranty period, typically for five years, covering breakdowns, damages and faults, including parts and labour costs.

During this time, the machine tool supplier takes care of all maintenance and calibration requirements. For an academic institution like OmSTU, such warranties are vital for keeping teaching and research facilities operational and helping to significantly reduce the overall cost of ownership.

The challenge for the University was how best to maintain their machine tools once the warranties had run out. Beyond the warranty period, with limited in-house resources, OmSTU was finding it increasingly difficult to keep its machine tool lab fully operational.

Natural wear-and-tear on its wide range of CNC machines saw an increasing need for troubleshooting, calibration and equipment repair, and with lead times on external service engineer visits being as long as three weeks, OmSTU needed an alternative, more efficient solution.

Solution

With the intention of moving machine tool calibration checks and maintenance in-house, OmSTU senior management invited equipment proposals from the world's leading metrology technology manufacturers.

The solution would need to be easy-to-use and be able to support the University's complete range of high-speed multi-axis CNC machine tools, enabling University staff to very accurately measure both static and dynamic positioning parameters, and make necessary adjustments and repairs.

After careful examination of the different offers submitted, OmSTU chose a Renishaw equipment solution comprising the XL-80 laser interferometer and QC20-W wireless ballbar systems.

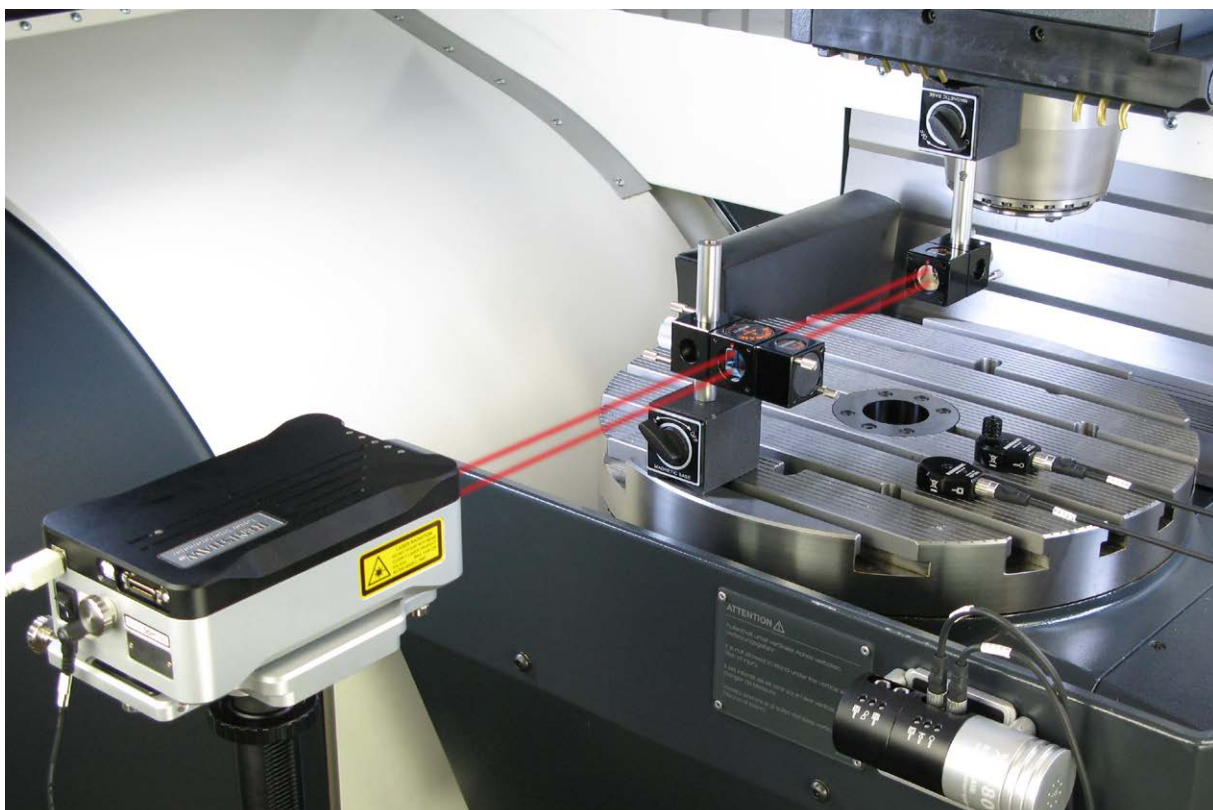
Aleksandr Koltsov, Senior Lecturer at OmSTU said, "We chose the Renishaw solution for a variety of reasons. Firstly, Renishaw's metrology equipment was already included in Russia's state register of measuring instruments. Secondly, the manufacturer offered a comprehensive warranty and service support package. And finally, the company's specialists actually came to the University and demonstrated the equipment, which convinced us that it was the right choice."



The decision to purchase Renishaw metrology equipment has proved to be a great investment in our students' futures. The experience students gain in using equipment of such quality and reliability provides a strong foundation for their future professional development.



Omsk State Technical University (Russia)



Laser calibration using a Renishaw XL-80 laser interferometer system

Results

The XL-80 laser interferometer and QC20-W ballbar systems transformed the way OmSTU's CNC machines are checked and maintained. Today, they are used throughout the engineering resource centre in the identification of CNC machine tool positioning inaccuracies. The problems of university machine tools breaking down, producing reject parts and lying idle for weeks on end have been removed.

Dmitry Blokhin, Assistant Professor at OmSTU explained, "The XL-80 measurement system is easy to use and saves us a great deal of time. For instance, it takes no more than an hour and a half to carry out diagnostics and adjust the positioning accuracy and backlash of the turning centre. This includes not only preparing the equipment for investigation, and assembling the laser system and optics, but also inputting the correction values and checking the results."

As a direct result of the improvements achieved in machine tool positioning accuracy and availability, the University saw an upturn in orders from local industry for the machining of higher tolerance parts. Furthermore, it was invited to provide machine tool inspection and calibration services. The result was an increase in the resource centre's order portfolio of 20%.

The XL-80 and QC20-W systems were also integrated into the University's teaching programs. In the 2019-20 academic year, third-year students taking the course module, 'Design and diagnostics for metal-cutting equipment' saw the introduction of laboratory assignments built on the Renishaw metrology systems.

Aleksandr Koltsov concluded, "The decision to purchase Renishaw metrology equipment has proved to be a great investment in our students' futures. The experience students gain in using equipment of such quality and reliability provides a strong foundation for their future professional development."



QC20-W ballbar system on CNC machine

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