RESULTS OF INTEGRATION OF EDUCATION AND PRODUCTION IN THE FIELD OF METROLOGY

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Abstract
The article deals with the history of cooperation between the university and the company of Hexagon manufacturing intelligence

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Cooperation between Hexagon Metrology, now Hexagon Manufacturing Intelligence and the Turin Polytechnic University in Tashkent began in 2010, when the company began to conquer the Central Asian market in the field of measurement equipment.

In the same year, the staff of the Metrology Center at the Turin Polytechnic University in Tashkent, were sent to traineeship to Hexagon Manufacturing Intelligence enterprises in Italy and Germany. They have completed comprehensive training in the field of measuring software QUINDOS 7 and I ++ Simulator and the maintenance of the coordinate measuring machine (CMM).

2011 for employees of the Center of Metrology at the Turin Polytechnic University in Tashkent, became rich in events. So, the Center was equipped with CMM Global Advantage 09.20.08 of DEA production with the LSP X-5 sensor head of Leitz production and the software Quindos 7 and PC-DMIS. This made it possible for the Center's employees, along with European engineers, to participate in the installation and adjustment of instrumentation systems and training of CMM operators at GM Powertrain Uzbekistan [1].

The plant operated by General Motors produces Ecotec 1.2L and 1.5L engines that are included in GM passenger cars, such as the Chevrolet Spark.

GM Powertrain - Uzbekistan uses eight coordinate measuring machines (CMM) of Hexagon Metrology. The four Leitz Reference HPs are placed inside special climate-controlled measuring cells directly next to the shop floor. They were planned, delivered and set up by Hexagon Metrology. Three Leitz Reference HP and one DEA GLOBAL Advantage are located separately in two metrology laboratories.

Technology from Hexagon Metrology ensures the quality of the most precious part of the car – its engine. GM Powertrain – Uzbekistan measures various engine components purchased from outside such as camshafts, crankshaft castings, block castings and head castings. Features such as roundness, cylindricity, angularity, flatness, and straightness as well as characteristics including diameter, length and depth are checked. The measured features have tolerances of 0.020mm for true position, 0.008mm for cylindricity and 0.005mm for roundness. In the future GM Powertrain – Uzbekistan plans to measure in-house produced cylinder blocks, cylinder heads and crankshafts [2].

The Center for Metrology at the University of Turin is divided into two parts. In one of them is located the laboratory in which all the necessary measurements carried out. The second part of the Center is allocated to the training sessions for university students. Thus, the processes of theory and practice in the university is inseparable.

In the future, the Metrology Center of the Turin Polytechnic University in Tashkent will become the main laboratory in Uzbekistan, which will certify the products produced by the localized enterprises of JSC "Uzavtosanoat".

In 2012, the company for the first time held the seminar on measuring equipment at the Turin Polytechnic University in Tashkent. At the seminar, novelties of measuring equipment were presented, such as CMM Global Advantage 09.20.08 of DEA, mobile CMM type Arm Romer and Laser Trackers Leica.

The seminar was attended by representatives of manufacturing enterprises, research institutes related to measurements and the National Agency Uzstandard.
In 2015, Hexagon Metrology became Hexagon Manufacturing Intelligence. This change was not simply about having a new identity. Hexagon Manufacturing Intelligence represents the evolution of our brand – the culmination of a number of changes which have taken place over the last few years and the embodiment of our continuing vision to realise truly data-driven manufacturing.

As Hexagon Manufacturing Intelligence, the company will continue to leverage its strengths as a world-class technology innovator and shape smart change in manufacturing. By working with her customers and responding to their needs, it continue to evolve, grow and help us change our world.

In 2014, the employees of the Metrology Center began to provide services for the servicing and software maintenance of coordinate measuring machines installed at the plant. GM Powertrain - Uzbekistan with the assistance of Hexagon Manufacturing Intelligence.

In November 2016, at a meeting of the university's management and representatives of the company, it was decided to hold annual seminars on measuring equipment on the territory of the university.

So, on February 7, 2018 the seminar "Application of measuring equipment Hexagon MI in the automotive industry", conducted by Hexagon Manufacturing Intelligence.

At the seminar, participants were briefed on the latest developments in the field of metrology equipment and tech-
nology of its application in the automotive industry, as well as asking questions to which the experts answered detailed.

Conclusion

TPU-Tashkent engineers provide warranty and post-warranty maintenance of measuring equipment at enterprises such as GMPT-Uzbekistan, GM Uzbekistan, MAN Auto-Uzbekistan, and also provide services for measuring the products of the machine-building industry of the Republic on geometrical accuracy.

References