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FORMATION OF THE COMPETENCES OF ENGINEERING STUDENTS IN THE FIELD OF USING THE THEORY OF MEASUREMENT UNCERTAINTY IN CONFORMITY ASSESSMENT

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The professional standards for students of engineering specialties within the framework of distance education require continual monitoring and updating of competencies, which must correspond to modern trends in the field of science and technology. During the formation of professional students' competencies in the field of Quality Assurance specialty 175 "Information and Measurement Technologies", it is important to be able to apply the theory of measurement uncertainty during the conformity assessment of products and services in accordance with international requirements. Therefore, in addition to the documents directly devoted to the issue of expressing the measurement uncertainty, namely JCGM 100:2008, JCGM 101:2008, JCGM 102:2011, JCGM 104:2009, special attention should be paid to the study of the document JCGM 106:2012 Evaluation of measurement data – The role of measurement uncertainty in conformity assessment, which was implemented into the Ukrainian regulatory framework as DSTU ISO/IEC Guide 98-4:2018 Uncertainty of measurements. Part 4: The role of measurement uncertainty in conformity assessment (ISO/IEC Guide 98-4:2012, IDT) [1].

The guidance document JCGM 106:2012 contains detailed recommendations on the procedure for assessing the compliance of the object's quality indicator with the specified requirements, constructing an acceptance interval, and making a decision regarding the recognition or non-recognition of the object as meeting the requirements. This means that the evaluated quality indicator is expressed in accordance with the principles of the measurement uncertainty theory, declared in the documents JCGM 101:2008, JCGM 102:2011, JCGM 103 and JCGM 104:2009.

General recommendations for conformity assessment are contained in the national standard DSTU ISO 10576-1:2006 (ISO 10576-1:2003 has been revised by ISO 10576:2022(en) Statistical methods — Guidelines for the evaluation of conformity with specified requirements). ISO 10576-1:2003 sets out guidelines for checking conformity with specified limits in the case where a quantity is measured and a resulting coverage interval (termed "uncertainty interval") is compared with a tolerance interval. JCGM 106:2012 extends this approach to include explicit consideration of risks, and develops general procedures for deciding conformity based on measurement results, recognizing the central role of probability distributions as expressions of uncertainty and incomplete information. JCGM 106:2012 pays special attention to the analysis of the consumer's and producer's risks of making incorrect decisions, related to the uncertainty of measurements. This allows to state that the standard's approach to conformity assessment has a clearly directed risk- and business-oriented focus.

References

1. JCGM 106:2012. Evaluation of measurement data – The role of the measurement uncertainty in conformity assessment. JCGM, 2012. 88 p.