NORMATIVE, METHODICAL, AND INFORMATION
ASSURANCE OF TESTS AND CERTIFICATION
OF SENSORS

V. N. Khramenkov and A. Yu. Kuzin

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The present state of normative and methodical assurance for the testing and certification of sensors is examined together with the requirements imposed on State test centers and test laboratories together with the procedures for their accreditation and for maintaining a State Register of measuring instruments, etc.

In accordance with Russian Federation Law on "the assurance of the traceability of measurements," all sensors intended for State metrological monitoring and supervision in the public health service, in the preservation of the environment, in industrial safety, and in the defense sphere are subject to mandatory tests with subsequent classification. In addition, provision is made for the voluntary certification of sensors used outside the sphere of State metrological monitoring and supervision.

At present a system for testing and classifying sensors has been created in the Russian Federation under the direction of Gosstandart Rossii (Russian State Standards Organization).

An important component part of this system is a normative and methodical base of tests and the certification of sensors for which the main documents regulate:
- the procedure for testing and classifying sensors;
- the requirements imposed on State test centers and test laboratories;
- the procedure for maintaining a State Register of measuring instruments and a special section of the register;
- the requirements imposed on specific classes of sensors and on the methods for testing them, etc.

TESTS AND CLASSIFICATION

The normative documents regulating the testing and classification procedure in the first place relate to the Metrology Rules PR 50.2.009—94 "State System for the Assurance of Traceability of Measurements (GSI): Procedure for performing tests and classifying measuring instruments" and normative documents covering special-purpose measuring instruments.

These documents regulate the questions of the interaction of sensor developers, State test centers (test laboratories), and Gosstandart Rossii, requirements imposed on the amount of testing and the formulation and recording of the test results. They also define the conditions and procedure for performing tests on the conformance with a classification.

The document PR 50.2.009—94 establishes the general requirements for the organization and procedure of testing and classifying measuring instruments which cover measuring instruments including sensors to be used in the spheres of State metrological monitoring and supervision.

The document PR 50.2.009—94 and normative documents for special-purpose measuring instruments were developed on the basis of the following principles:
- correspondence of the system of tests and classification to legal regulations (both Russian and international), to active normative documents regulating questions of sensor development and testing and technology as a whole;
- continuity, to provide for the maximum utilization of the potential of an established system of sensor tests;
- efficiency, to ensure that tests performed in different systems for one class of sensor are not duplicated;
- responsibility, to define specific requirements to which the testing of sensors in a given system must correspond;

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– system stability, to make it possible to establish its independence of structural changes in industry and the economy as a whole.

The organizational structure of the testing and classification of special-purpose sensors is formed by Gosstandart Rossii, the Scientific and Technical Committee of Gosstandart Rossii, the management of Gosstandart Rossii, the management organ of the Metrological Service of the Armed Forces of the Russian Federation, the 32 Scientific-Research Centers of the Metrological Branch of the Russian Federation, the State Centers for Testing Measuring Instruments, the State Scientific Metrological Centers of Gosstandart Rossii, the All-Union Scientific-Research Institute of the Metrological Service, the All-Union Scientific-Research Institute of Physicotechnical and Radio-Engineering Measurements, specialized organizations accredited to established procedures as test laboratories, organs of the State Metrological Service, military representatives.

The functions are distributed between organizations participating in the performance of testing and classifying special-purpose sensors taking into account the requirements of the Russian Federation Law "on the assurance of the traceability of measurements" and the established distribution of mandatory regulations for sensor tests.

The procedure for organizing and performing tests and classifying sensors provided for by the normative documents involves carrying out a coordinated scientific and technical policy in this area, introducing unified metrological rules and norms for ensuring traceability and the required measurement accuracy, and also controlling the development of an inventory of sensors.

STATE TEST CENTERS AND TEST LABORATORIES.
REQUIREMENTS AND ACCREDITATION PROCEDURE

The requirements imposed on State test centers and test laboratories, and also their accreditation procedure, are laid down in the document PR 50.2.010—94 and in the recommendation MI 2321—94.

These contain the requirements for personnel, test equipment, measuring instruments, accommodation, documentation, and also contain the rules and mandatory regulations for organizations authorized to perform sensor tests.

The accreditation of State centers for testing measuring instruments is an acceptance of their competence to perform work involving the testing and classification of sensors in accordance with Russian Federation Law. Following accreditation a State center is given an accreditation certificate with an appendix establishing the area of accreditation. The period of validity of the accreditation certificate must not exceed 5 years.

A State test center must have an organizational structure, personnel, test equipment, measuring instruments, and accommodation which guarantee the performance of the testing and classification of sensors. The personnel must be professionally trained and have the technical knowledge and experience necessary to discharge the obligations placed on it for testing measuring instruments. Each worker must be given official instructions establishing the requirements for the level of education, professional training, technical knowledge, and experience of work in the area of testing measuring instruments. The test equipment and measuring instruments which the State test center has at its disposal must guarantee the performance of their tests in the area of accreditation. As necessary, the use of test equipment from other organizations is permitted, in accordance with concluded agreements. All the test equipment and measuring instruments must be maintained under conditions which ensure their preservation and protection from corrosion and premature wear-and-tear. Faulty test equipment and measuring instruments, and also test equipment which has passed beyond its certification date and measuring instruments whose verification or calibration period has expired must be taken out of use.

The test equipment necessary for performing tests in an accredited area must be certified and must have an appropriate certificate in accordance with the State All-Union Standard GOST 24555 "Procedure for the certification of test equipment — basic regulations." The measuring instruments used to perform the tests in an accredited area must possess a verification or calibration certificate.

A State test center must also have at its disposal: appropriate normative documents on the assurance of traceability of measurements, classification programs and programs for testing measuring instruments, documentation establishing the technical requirements for tested measuring instruments, methods for verifying the measuring instruments tested in the area of accreditation, operating documentation for the test equipment and measuring instruments, and other documents necessary in order to test measuring instruments in accordance with the area of accreditation.

The requirements imposed on the test laboratories are similar to those given above. An important difference is that in the case of the test laboratories the accreditation is an official indication of their authority "in collaboration" to perform work related to testing of measuring instruments.