



100 YEARS OF THE VNIIMS

Main Russian State Metrology Service Scientific Center commemorates centenary

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Metrology as a science and as a measurement-related activity only emerged in the majority of states in the middle of the 19th to the beginning of the 20th centuries.

In Russia, 1842 was marked by the adoption of an “Act on Weights and Measures” and by the establishment of a *Dépôt* of standard measures. In 1893 the *Dépôt* was reorganized as the Main Chamber of Weights and Measures, which is at present the D.I. Mendeleev Institute of Metrology - the VNIIM.

The D.I. Mendeleev measurement affairs reform gave rise to the establishment of local verification offices: the first two were set up in St. Petersburg, then one in Moscow, another in Warsaw, and one railway coach verification unit was created.

In 1875 Russia signed the Meter Convention and the First CGPM was held; then in 1895 a correlation was established between the Russian, Metric and British systems of measurements.

The inauguration of the Moscow Verification Office on 1 October 1900 is actually the “birthday” of the VNIIMS, the Russian research institute of metrological service, which was equipped with metric standard measures. In 1900–1901 the Office verified 99.9 % and in 1902 99.7 % of the total measures to be checked within the verification system.

The Moscow Office played an important role in introducing the metric system in Russia and in 1923 the system was admitted at national level. The same Office was also involved in verifying instruments manufactured abroad that were imported into Russia in great number. For example in 1925–1926, 18 240 scales, 499 074 length measures and 466 505 imported thermometers were verified. These represented 99.9 %, 77.8 % and 67.1 % respectively of the total instruments verified, since the majority of imported measures and instruments had to pass quality inspection in Moscow due to the State monopoly on foreign trade.

In 1927 the Moscow Verification Office was reorganized into the Weights and Measures Chamber of the

Russian Soviet Federal Socialist Republic (RSFSR), and until 1932 it was not only entrusted with verification, but also with the supervision of verification laboratories in the RSFSR.

In 1933 on the basis of the Chamber’s laboratories, the Institute for Metrology and Standardization was established, which in 1934 was reorganized into the Russian Research Institute of Metrology. In that year, the Institute conducted its first type evaluation (a domestic-produced dynamometer), and the State Register of type approved instruments was launched.

By 1940 the Institute had already tested 66 types of instruments, developed 14 verification instructions, conducted 15 research themes, and verified a great number of instruments. At that time the Institute had 500 staff members. During wartime 1941–1945, some specialists and equipment were evacuated to Tomsk, Barnaul and other cities in order to provide assistance to enterprises that had also been evacuated there.

In 1947 a Central Research Bureau of Uniform Time Service was created at the Institute, which was reorganized in 1953 as a separate Institute of Radio Technical Measurements (at present - VNIIFTRI).

It may be of interest to note that scientific staff growth was as follows:

1949: 14 doctors and candidates of science (PhD) out of 78 research workers;

1957: 26 doctors and candidates out of 171 researchers;

2000: 64 doctors and candidates out of 272 researchers and engineers.

The Government and the Party’s decree issued in December 1972 established a new organization of the State Metrological Service, and the Institute was assigned the function of Head Center of the State Metrological Service; it was reorganized into the All-Union Research Institute of Metrological Service - VNIIMS.

In 1974 a group of scientists from academic institutes joined the VNIIMS, making it possible to expand a program of fundamental research in such directions as investigation of new principles for creating measure-

ment standards and high precision measuring instruments in quantum metrology, determination of molecular constants, problems in gas discharge, superconductivity, electron processes, and gravitation. Simultaneously, much work was conducted on guidance of type evaluation and approval of measuring instruments, development of a normative base of legal metrology, and methodological guidance of the State and departmental metrological organizations. This work was aimed at ensuring measurement uniformity in the country, and providing State supervision and departmental control over the condition and application of measuring instruments.

In 1974 the State Service of Standard Reference Data on Physical Constants and Properties of Substances and Materials (GSSSD) was attached to the VNIIMS.

In 1975 when the VNIIMS commemorated its 75th anniversary, the Institute's staff totaled 800. In the same year, the interdepartmental Scientific Council on Measurement Problems was organized as proposed by the USSR Academy of Sciences, the Ministry of Higher Education, the Gosstandart and the Ministry of Defense. At that time, the first All-Union scientific and technological conference "Metrological assurance of the national economy" was organized and held by the VNIIMS; such conferences became a tradition. The most recent one, convened as before by the VNIIMS, took place in Yaroslavl in 1999.

In April 1993 the Russian Parliament adopted the Law on "Assurance of measurement uniformity", developed by VNIIMS specialists. The Institute made good progress in the work of putting the Law's principles into metrological practice.

Today, the VNIIMS is accredited not only as a scientific organization, but also as the State center for testing, certification and verification of measuring instruments, as well as a scientific and methodological center for the Russian calibration system, etc. (see Fig. 1). The VNIIMS consists of two main parts: a group of divisions which ensure the function of the Head Center of the State Metrological Service and a group of laboratories that perform the function of a center for measurement standards in assigned measurement classes and fields (see Fig. 2).

Together with the other metrological institutes of the Gosstandart of Russia, the VNIIMS continues work aimed at improving the State system for ensuring the uniformity of measurements (GSI). This is a guiding system that includes legal, organizational and technical subsystems.

The VNIIMS is the State scientific metrology center (GNMC) which includes (besides itself) the Scientific Center for Surface and Vacuum Research (NICPV) and the Russian Research Center for Standardization, Information and Certification of Raw Materials, Substances and Materials (VNICSMV).

One of the important priorities of the VNIIMS is its active participation in the diversity of accreditation, which ensures mutual confidence between consumers and producers of metrological work and services, confirmation of technical competence and independence of the latter, creation of the necessary conditions for international recognition of measurement and test results and their certificates. Since 1993 and to date, hundreds of metrology services, test and measurement laboratories and centers have been accredited for technical competence, verification rights, calibration etc.

The international activity of the VNIIMS is connected with scientific and methodological guidance and coordination of international work in the field of metrology within the country; the Institute is responsible for a number of Russia's secretariats for the OIML, ISO, COOMET, APLMF, CIS, etc. The VNIIMS is a participant of the Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by national metrology institutes which was signed in Paris on 14 October 1999 during the 21st CGPM. The Institute also actively cooperates with the PTB, NPL, NIST, BIPM and other organizations.

Comprising today over 20 divisions and laboratories, the VNIIMS is a base Institute for the country's legal metrology activities and is a reliable partner in international cooperation, such as will be demonstrated once again during the Jubilee Conference in Moscow on 2-3 October 2000, devoted to the 100th anniversary of the VNIIMS. ■

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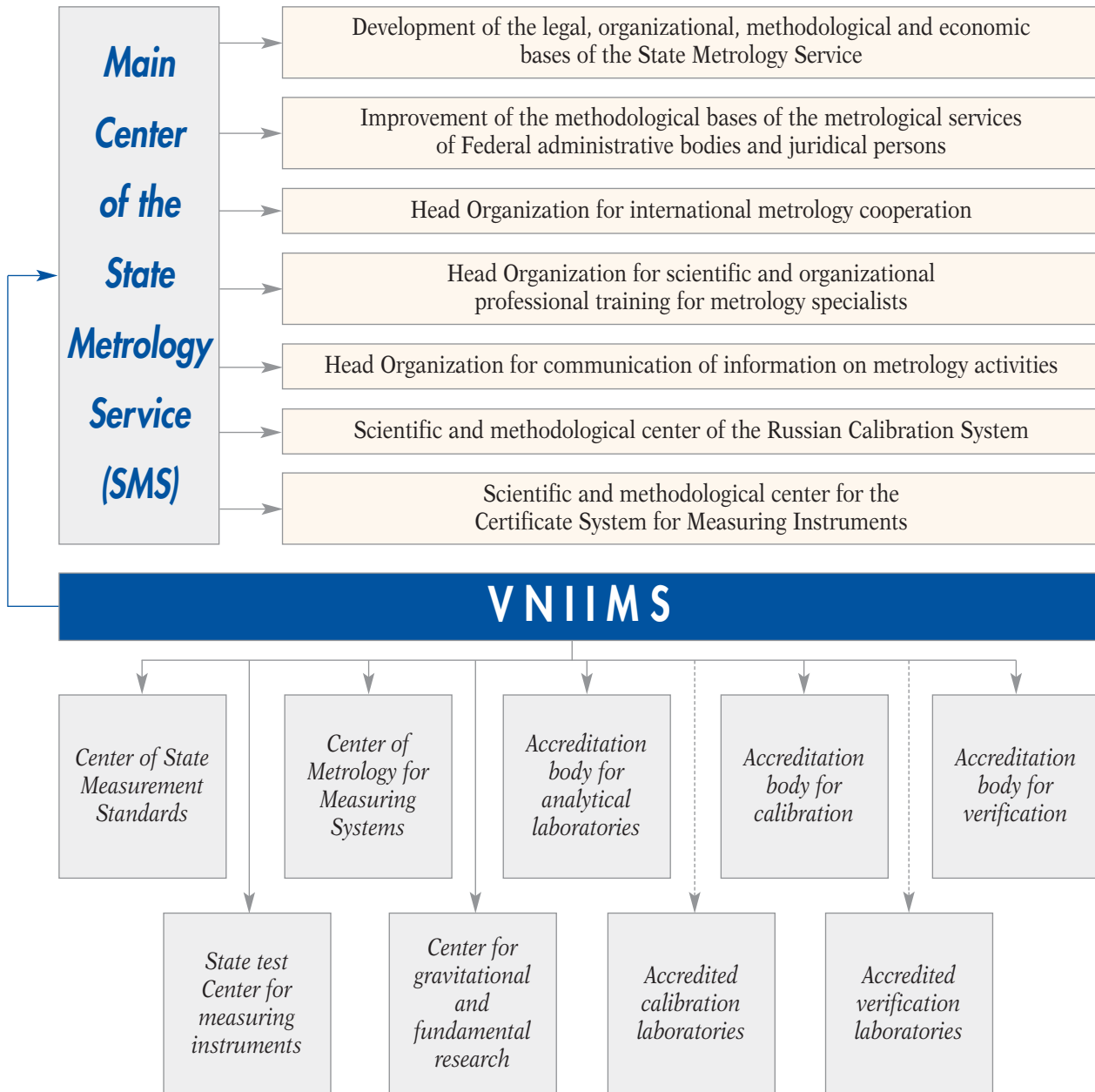


Fig. 1 Basic functions of the VNIIMS

<p>Entrusted measurement fields:</p> <ul style="list-style-type: none"> • Pressure measurement • Geometric parameters of surface finish • High and super-high voltage • Composition and properties of substances by means of chromatographic and optical methods • Linear and angular vibration and variable forces 	<p>VNIIMS as a center of measurement standards:</p> <ul style="list-style-type: none"> • Ensures maintenance and functioning of State and working standards and instruments of the highest accuracy • Carries out their research and improvement • Performs fundamental and applied investigations aimed at developing new generations of standards
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Fig. 2 VNIIMS - Center of measurement standards