Metrological inspection of measuring and testing equipment used for quality control of products is an urgent problem.

We will agree to call equipment intended for measuring the parameters of articles being manufactured measuring equipment, and equipment which transmits certain strictly standardized external actions to the article for a given time interval, testing equipment. On the whole, measuring and testing equipment is called "equipment" below.

The solution of the problem of organizing metrological inspection of equipment is complicated by the fact that so-called nonstandard equipment is used very often in quality control, which as a rule is manufactured by non-specialized enterprises in a very small number. At the same time the reliability of quality control of product depends on its technical condition. This determines the expediency of developing uniform principles of the approach to the organization of their inspection.

Metrological inspection of equipment has been organized at many enterprises of many branches of industry. However, there is still no single approach to the solution of this problem. At present inspection of equipment in most cases amounts to conducting a primary and periodic check ("proverka").

It is timely to note that the term "poverka" ("check") is used along with the term "proverka" ("check") in metrological practice. The former is used even more widely. There is not always a uniformity in their use. In [1, 2, et al.], where the essence of the term "poverka" is revealed, the latter is defined as an operation consisting in establishing the error of the measurement means. The impermissibility of using the term "poverka" for operations having the purpose of determining individual characteristics or properties of the measurement means is indicated.

At the same time in some metrological documents [3 et al.] the term "poverka" is used in a generalized sense for denoting a complex of works performed when inspecting the measurement means. In a number of cases [4 et al.] it is applied to operations having no bearing on determination of the error (for example, "check" ("poverka") of the overshoot at the peak of pulses). In the text of some documents [5] both terms are used simultaneously for denoting the same operations. Some documents call the same operations "proverka" (for example, "proverka" of perpendicularity) [6] and others, "poverka" [7], etc.

It is shown below that when evaluating the technical condition of testing equipment, it is impossible to raise the problem of the measurement error. In many cases when evaluating measuring equipment the error can be determined, but here also many characteristics which cannot be determined by the magnitude of the error are subject to control.

Thus, we can conclude that the use of the term "proverka" which is broader than the concept "proverka," is more expedient with respect to measuring and testing equipment. Henceforth, we will use precisely this term.

However, a primary and periodic check does not exhaust the problem of metrological inspection of equipment. A metrological examination of the technical documents on the equipment being developed is presently acquiring a considerable role.

Since nonstandard equipment does not undergo state tests, the primary check of its first model plays a special role in the inspection process. With respect to the volume and character of works conducted it differs considerably

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from the primary check of subsequent specimens of the given type of equipment. Therefore, it is expedient to de-
termine that the first model of equipment newly developed and manufactured for the first time undergoes metrolog-
ical certification rather than a primary check. Only in the presence of a favorable conclusion with respect to this
certification can the manufacture of subsequent specimens be allowed.

In connection with the foregoing the following can be considered the main stages of metrological inspection
of equipment: metrological examination of documents on the equipment being developed; metrological certifica-
tion of the new equipment (first model); primary check; check after maintenance; periodic check; nonroutine check.

Here, checking of the equipment after maintenance is singled out as a special stage of organizing inspection
works. We do not find this category in the practice of working with standard measurement means. This is explained
by the fact that the equipment being considered is generally multifunctional and has a complex scheme and design.
Therefore, operating failures of its individual elements can be relatively frequent, especially under intense operat-
ing conditions. After restoring the instrument, it is necessary to check those characteristics which repair could have
affected. In most cases it is not necessary to check to the full extent stipulated for its primary stage (especially if
one considers that often it is very extensive).

In organizing equipment inspection, it is necessary to be guided by the following documents: a) standards and
specifications on the equipment; b) standards and specifications on articles, for the quality control of which it is in-
tended; c) operating documents for it.

One should be guided by documents of groups "a" and "b" mainly when conducting metrological examination
and certification. Here of course it is necessary to bear in mind that the problem of specific types of articles whose
control will be done on the equipment has already been solved at these stages (if, for example, the types of articles
are listed in the operating documents). If the equipment is general-purpose and the types of articles are not listed
in the operating documents, then the need to use documents of group "b" can arise also at later stages of inspection.
This is explained by the circumstance that the operating documents of general-purpose equipment may not take in-
to account certain special requirements imposed when measuring parameters or testing individual types of articles.

In the case of primary, periodic, and nonroutine checks and also in checking after maintenance, it is general-
ly sufficient to be guided by documents of group "c." In this case the presence of methodological instructions on
checking equipment should be a necessary condition [8]. Unfortunately, the "Unified System of Designer's Docu-
ments, Operating Documents" (ESKD) [9] does not require such instructions. It calls for a different procedure for
regulating check works. This lack of coordination interferes with the normal organization of checking of equipment.

The methodological instructions on checking should, in our opinion, include a list of characteristics of equip-
ment, its individual components or units subject to checking; specifications on each characteristic, component, or
unit; method of checking; recommended periodicity of checking each characteristic, component, or unit.

The end purpose of checking the equipment is to be certain that it is operable and can be used for evaluating
product quality.

When it is the case of measuring equipment it is necessary to make sure that the measurements of the param-
ters of articles on it are correct. It is desirable to know the magnitude of the permissible and actual error of the
measuring equipment for each of the parameters of the articles being measured on it. In essence this statement
equals measuring equipment to any measurement means, but there is also a difference. As a rule agencies of the
metrological service deal not with measurement errors but with errors of the measurement means. In this case the
purpose of the check is as though limited. An instrument (meter, etc.) is evaluated independent of the operation
(its specific characteristics, conditions, etc.) in which it will be used. In this case it is not fitting to speak about the
error of the measurements, since nothing is known about the measurements themselves. The situation is different in
the case of measuring equipment. Here everything is concrete. And therefore it is possible to speak not only about
the error of the measuring equipment but also about the measurement error on the whole.

The problem of checking testing equipment consists of being certain that the regime of testing the articles
stipulated by the technical document is provided. Here it is assumed that only deviations from the nominal regime
that exceed the allowance will affect the test results. The regime should be provided during a certain, sometimes
long time interval. Most often it is determined simultaneously by several physical quantities. Since in most cases
the parameters are not measured on this equipment, there is no sense in speaking about measurement errors here.

By analogy with mass-produced measurement means, two main methods are found in equipment checking
practice: elementwise and setwise. If the purpose of the check is to determine the measurement error, the setwise