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INDC INTERNATIONAL NUCLEAR DATA COMMITTEE

USSR Numerical Data Publication Standards

Translation of Official Publications issued by the USSR State Committee on Standards, Moscow

Translated by the IAEA

September 1982

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L81-22456
Translated from Russian

USSR STATE STANDARD

System of Standards for Information, Librarianship and Publishing

PRESENTATION OF THE EXPERIMENTAL NUMERICAL DATA ON PROPERTIES OF SUBSTANCES AND MATERIALS IN ARTICLES IN PERIODICALS, SERIALS AND NON-PERIODICAL COLLECTIONS

General Requirements

GOST 7.33-81

DRAWN UP by: USSR State Committee on Standards
USSR Academy of Sciences

USSR State Committee on Science and Technology

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SUBMITTED by: USSR State Committee on Standards

V.S. Krivtsov, Acting Head of Technical Administration

APPROVED AND PUT INTO FORCE by Decree No. 3270 of the USSR State Committee on Standards of 30 June 1981

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USSR STATE STANDARD

System of Standards for Information, Librarianship and Publishing

PRESENTATION OF THE EXPERIMENTAL NUMERICAL DATA ON PROPERTIES OF SUBSTANCES AND MATERIALS IN ARTICLES IN PERIODICALS, SERIALS AND NON-PERIODICAL COLLECTIONS

GOST 7.33-81

General requirements

Pursuant to Decree No. 3270 of the USSR State Committee on Standards of 30 June 1981 the standard is to be in force for the period

from 1 January 1982
to 1 January 1985

This standard lays down the general requirements on the publication of experimental numerical data on properties of substances and materials (hereinafter referred to as "experimental numerical data") in articles in periodicals, serials and non-periodical collections describing the results of experimental work with a view to the correct and unambiguous use of data, the evaluation of their reliability and their reproducibility.

The standard is in conformity with the Guide for the Presentation in the Primary Literature of Numerical Data Derived from Experiments of the ICSU Committee on Data for Science and Technology (CODATA).*/

*/ CODATA Bulletin 9 (1973).

1. THE DESCRIPTION OF EXPERIMENTAL PROCEDURES

1.1. The article must give the information necessary on the origin, treatment and storage of the object being studied, its chemical composition, structure and physical state.

1.2. When a method of research (or experimentation) previously described in a publication has been used, the principal features of it and a reference to its source must be given. Changes made in a method of which a description has previously been published must be described in detail. A new method should be described in such a way that it can be reproduced. The reasons for using a method must also be given. When data have been obtained under changed experimental conditions, these changes must be mentioned. Descriptions of and references to generally accepted methods should not be made.

1.3. For batch-produced apparatus the model type and accuracy class in accordance with technical specifications should be given. References must be given for devices described previously. Apparatus and measuring systems being used for the first time should be described in detail, and the results of tests and verifications should be given, with the calibration methods, sampling procedures and measurement systems being specified. There should also be indication of the characteristics of the measurement systems such as noise levels, stability, sensitivity and resolution.

1.4. The article should specify such influential factors as environmental conditions (temperature, humidity, pressure etc.) and the effect of measurement systems on the properties of the objects being measured. Factors of influence are divided up into those which are constant, those which vary during the course of the experiment, and those which require corrections to be made.

Notes:

1. If the Ministry (Department) involved considers the publication of the information mentioned in Sections 1.1, 1.3 and 1.4 undesirable it may be omitted.

2. References to the technical specifications used (in force) as mentioned in Sections 1.1, 1.2 and 1.3 are mandatory.

2. PRESENTATION OF NUMERICAL EXPERIMENTAL RESULTS

2.1. The article should give the numerical data which are obtained directly during the course of the experiment (unsmoothed data). The amount of data given should be sufficient for independent treatment and assessment of their reliability. If smoothed data are also cited in the paper, the deviations between experimental and smoothed numerical data should be stated.

2.2. When a known calculation technique is used a reference to its source must be given. When a new calculation technique is used the method of calculation, the theoretical model or empirical relationship must be described.

2.3. Experimental numerical data must be presented in the form of explicitly titled tables. Results from other sources shown in the tables must be accompanied by references. The presentation of data in the form of figures or equations is not a substitute for their presentation in the form of tables.

2.4. Scaling factors and constants used should be given together with the sources from which they are taken.

2.5. The results of experimental research must be presented in the International System of Units (SI units) in accordance with Council for Mutual Economic Assistance (CMEA) Standard ST SEhV 1052-78. The names and symbols for quantities used should be in accordance with the standards in force, the standards of the International Organization for Standardization and the recommendations of international scientific unions.

3. ANALYSIS OF DATA OBTAINED

3.1. When assessing the reliability of data, random and systematic errors should be identified separately. The errors in data given in an article should be presented in accordance with the requirements of USSR State Standards GOST 8.011-72 and GOST 8.207-76.

3.2. It is essential to mention the method used for assessing the reliability of data. References should be provided in the case of known methods. The reasons for applying new or rarely used methods, which must be described in full, are to be given.

3.3. For the assessment of the reliability of independent measurements, the independence of the methods used should be demonstrated where this is not obvious.

3.4. Computer programs used for treating data must be described or a reference to their source given.

3.5. For the analysis of numerical data obtained it is necessary to compare the results obtained with the results of other investigators.

Divergences from known theoretical models or empirical laws and the possible reasons for them must be mentioned.

SI BASE UNITS

Quantity	Unit		
	Name	Symbol	
		Russian	International
LENGTH	metre	m	m
MASS	kilogram	kg	kg
TIME	second	s	s
STRENGTH OF ELECTRICAL CURRENT	ampere	A	A
THERMODYNAMIC TEMPERATURE	Kelvin	K	K
QUANTITY OF MATTER	mole	mol'	mol
LUMINOUS INTENSITY	candela	kd	cd
SI ADDITIONAL UNITS			
Plane angle	radian	rad	rad
Solid angle	steradian	sr	sr

SI DERIVED UNITS WITH OWN NAMES

Quantity	Unit		Expression of derived unit	
	Name	Symbol	In other SI units	In SI base units
Frequency	hertz	Hz	-	s^{-1}
Force	newton	N	-	$m \cdot kg \cdot s^{-2}$
Pressure	pascal	Pa	N/m^2	$m^{-1} \cdot kg \cdot s^{-2}$
Energy, work, quantity of heat	joule	J	$N \cdot m$	$m^2 \cdot kg \cdot s^{-2}$
Power, energy flux	watt	W	J/s	$m^2 \cdot kg \cdot s^{-3}$
Quantity of electricity, electrical charge	coulomb	C	$A \cdot s$	$s \cdot A$
Voltage, electrical potential	volt	V	W/A	$m^2 \cdot kg \cdot s^{-3} \cdot A^{-1}$
Electrical capacitance	farad	F	C/V	$m^{-2} \cdot kg^{-1} \cdot s^4 \cdot A^2$
Electrical resistance	ohm	ohm	V/A	$m^2 \cdot kg \cdot s^{-3} \cdot A^{-2}$
Electrical conductivity	siemens	S	A/V	$m^{-2} \cdot kg^{-1} \cdot s^3 \cdot A^{-2}$
Magnetic flux	weber	Wb	$V \cdot s$	$m^2 \cdot kg \cdot s^{-2} \cdot A^{-1}$
Magnetic induction	tesla	T	Wb/m^2	$kg \cdot s^{-2} \cdot A^{-1}$
Inductance	henry	H	Wb/A	$m^2 \cdot kg \cdot s^{-2} \cdot A^{-2}$
Luminous flux	lumen	lm	-	$cd \cdot sr$) */
Illumination	lux	lx	-	$m^{-2} \cdot cd \cdot sr$) */
Nuclide activity	becquerel	Bq	-	s^{-1}
Radiation dose	gray	Gy	-	$m^2 \cdot s^{-2}$

*/ An additional unit - the steradian (which has the same status as SI base units) - is included in these two expressions.

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USSR STATE STANDARD

System of Standards for Ensuring Uniformity of Measurements

INDICES OF MEASUREMENT ACCURACY AND FORMS OF PRESENTATION OF MEASUREMENT RESULTS

GOST 8.011-72

DRAWN UP BY:	All-Union Scientific Research Institute of the USSR State Committee on Standards Z.F. Urazaev, Director A.S. Nemirovskij and V.M. Kriksunov, Subject Chiefs
SUBMITTED BY:	Standards and Measuring Technology Supervisory Administration of the USSR State Committee on Standards G.N. Sharonov, Head of Administration
PREPARED FOR APPROVAL BY:	Standards and Measuring Technology Supervisory Administration of the USSR State Committee on Standards N.K. Ashcheulov, Deputy Head of Administration Measurement Equipment Testing Administration of the USSR State Committee on Standards N.D. Fursov, Deputy Head of Administration Metrology Administration of the USSR State Committee on Standards A.P. Rudnev, Deputy Head of Administration All-Union Scientific Research Institute of the USSR State Committee on Standards V.I. Kiparenko, Deputy Director V.G. Tsejtlin, Laboratory Chief D.I. Mendeleev All-Union Scientific Research Institute of Metrology V.O. Arutyunov, Director K.P. Shirokov, Section Chief All-Union Scientific Research Institute of Physico-Technical and Radiotechnical Measurements R.A. Valitov, Director P.N. Agaletskij, Section Chief
APPROVED BY:	USSR State Committee on Standards on 16 December 1970 [Report No. 249] B.M. Isaev, Chairman of the Scientific and Technical Commission on Metrology and Measurement Techniques and Deputy Chairman of the USSR State Committee on Standards A.I. Ivlev, G.N. Sharonov, A.M. Moskvichev, Z.F. Urazaev and V.I. Kiparenko, Members of the Commission
PUT INTO FORCE BY:	Decree No. 463 of the USSR State Committee on Standards of 22 February 1972

Pursuant to Decree No. 463 of the USSR State Committee on Standards of 22 February 1972, the standard is to enter into force

on 1 January 1973

This standard lays down numerical indices for measurement accuracy, methods of expressing them and forms of presentation of the measurement results.

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1. MEASUREMENT ACCURACY INDICES

1.1. The following measurement accuracy indices are established:

the range within which the measurement error is found with a given probability;

the range within which the systematic component of the measurement error is found with a given probability;

the numerical characteristics of the systematic component of the measurement error;

the numerical characteristics of the random component of the measurement error;

the distribution function (probability density) of the systematic component of the measurement error;

the distribution function (probability density) of the random component of the measurement error.

2. METHODS OF EXPRESSING MEASUREMENT ACCURACY

2.1. Measurement accuracy should be expressed in one of the following ways:

by the range within which the total measurement error is found with a given probability;

by the range within which the systematic component of the measurement error is found with a given probability; by the standard approximation of the distribution function for the random component of the measurement error, and by the standard deviation of the random component of the measurement error;

by the standard approximation of the distribution functions for the systematic and random components of the measurement error and their standard deviations;

by the distribution functions of the systematic and random components of the measurement error.

The choice of method is determined by the purpose of the measurements and the way in which their results are to be used, and is governed by the appropriate regulatory documents.

3. FORMS OF PRESENTATION OF MEASUREMENT RESULTS

3.1. When expressing measurement accuracy in terms of the range within which the total measurement error is found with a given probability, the following form is laid down for the presentation of the measurement results:

$$A;\ \Delta \text{ from } \Delta_L \text{ to } \Delta_U;\ P$$

where: A is the measurement result in units of the quantity measured;

Δ, Δ_L, Δ_U are the measurement error and its lower and upper limits respectively, in the same units;

P is the given probability with which the measurement error occurs within these limits.

Example: 121 m/s, Δ from -1 to 2 m/s, P = 0.99.

3.2. When expressing measurement accuracy in terms of the range within which the systematic component of the measurement error is found with a given probability; the standard distribution function approximation for the random component of the measurement error, and the mean square deviation of the random component of the error, the following form is laid down for the presentation of the measurement results:

[Formula missing]*/

where: Δ_S, Δ_{SL}, Δ_{SU} are the systematic component of the measurement error and its upper and lower limits respectively, in units of the quantity measured;

P_S is the given probability with which the systematic error component occurs within these limits;

*/ Note by Division of Languages: There appears to be one line missing in the Russian text.

$\sigma(\Delta)$ is an estimate of the standard deviation of the random component of the measurement error in units of the quantity measured;

$f^{ST}_{\overset{o}{\Delta}}(\xi)$ is the standard approximation of the distribution function for the random component of the measurement error selected from the list given in the Annex.

Example: 10.75 m^3/s; Δ_s from 0.15 to 0.23 m^3/s; $P_s = 0.95$

$$\tilde{\sigma}(\overset{o}{\Delta}) = 0.20\ m^3/s;\ \text{unif.}$$

3.3. When expressing measurement accuracy in terms of the standard distribution function approximations of the systematic and random components of the measurement error and their standard deviations, the following form for the presentation of the measurement results is laid down:

$$A;\ \tilde{\sigma}(\Delta_S);\ f^{ST}_{\Delta_S}(\xi);\ \tilde{\sigma}(\overset{o}{\Delta});\ f^{ST}_{\overset{o}{\Delta}}(\xi),$$

where: $\tilde{\sigma}(\Delta_S)$ is an estimate of the standard deviation of the systematic component of the measurement error in units of the quantity measured;

$f^{ST}_{\Delta_S}(\xi)$ is the standard distribution function approximation for the systematic component of the error, selected from the list given in the Annex.

Example: 153.07B; $\tilde{\sigma}(\Delta_S)$ = 0.03B; unif.; $\tilde{\sigma}(\overset{o}{\Delta})$ = 0.01B; norm.

3.4. When expressing measurement accuracy in terms of distribution functions of the systematic and random components of the measurement error, the following form is laid down for the presentation of the measurement results:

$$A;\ f\Delta_S(\xi);\ f\overset{o}{\Delta}(\xi),$$

where: $f\Delta_S(\xi)$; $f\overset{o}{\Delta}(\xi)$ are the distribution functions (probability density) of the systematic and random components of the measurement error respectively, given in tables, graphs (with the scale indicated) or formulae (with the numerical values of the parameters indicated), and both functions should be presented in the same form.

Example: 218B,

$$f\Delta_S\ (\xi) = ¼\ ^1/_B \text{ where } -2B \leq \xi < 2B;$$

$$f\Delta_S\ (\xi) = 0 \text{ where } -2B > \xi \geq 2B;$$

$$f\Delta_S\ (\xi) = \frac{1}{\sqrt{2\pi}\cdot 2}\ \exp\left(-\frac{\xi^2}{8}\right)\ ^1/_B$$

Note: When distribution functions for measurement error components have to be presented in the form of tables or graphs, the number of argument values for which the table or figure is formulated and the interval between adjacent argument values are selected in each individual case during the measurement method certification process.

3.5. When presenting the results of several measurements with identical accuracy indices in the form of a table, the accuracy indices should be indicated in the table heading or in an explanatory note attached to the table.

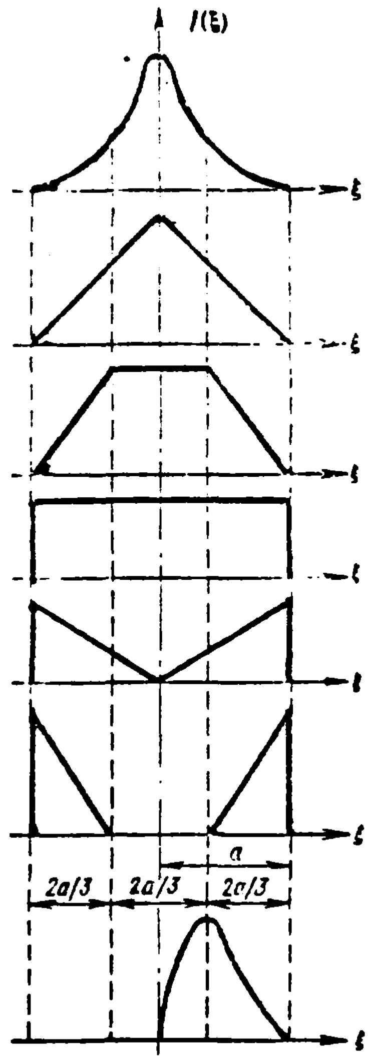
3.6. When presenting the results of several measurements with identical accuracy indices in the form of a series of values, the accuracy indices are given once for all the measurement results.

3.7. The smallest significant digits of the numerical values of the measurement result and of the numerical accuracy indices should be identical.

3.8. The numerical accuracy indices of measurements should have no more than two significant figures.

A N N E X

TABLE OF STANDARD DISTRIBUTION FUNCTION APPROXIMATIONS

Name of function	Abbreviated designation	Graph	a(σ)
Normal (truncated)	norm.		3.0
Triangular (Simpson)	Δ		2.4
Trapezoidal	trap.		2.3
Uniform	unif.		1.7
Antimodal I	am I		1.4
Antimodal II	am II		1.8
Rayleigh (truncated)			3.3

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USSR STATE STANDARD

System of Standards for Ensuring Uniformity of Measurements

DIRECT MEASUREMENTS WITH MULTIPLE OBSERVATIONS. METHODS OF PROCESSING OBSERVATION RESULTS.

GOST 8.207-76

Basic principles

Pursuant to Decree No. 619 of the USSR State Committee on Standards of 15 March 1976 the standard is to be in force for the period

from 1 January 1977
to 1 January 1982

The present standard applies to the regulatory documentation provided for in GOST 8.010-72, which lays down methods of carrying out direct measurements with multiple independent observations, and sets forth the basic principles underlying methods of processing observation results and estimating the errors in measurement results.

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1. GENERAL PRINCIPLES

1.1. In the statistical processing of a set of observation results the following operations should be performed:

Elimination of known systematic errors from the observation results;

Calculation of the arithmetic mean of the corrected observation results, which is taken as the measurement result;

Calculation of the estimated standard deviation of the observation result;

Calculation of the estimated standard deviation of the measurement result;

Testing of the hypothesis that the observation results follow a normal distribution;

Calculation of the confidence limits of the random error (random component of the error) in the measurement result;

Calculation of the limits of the uneliminated systematic error (uneliminated residue of the systematic error) in the measurement result;

Calculation of the confidence limits of the error in the measurement result.

1.2. The hypothesis that the observation results follow a normal distribution should be tested at a level of significance q between 10 and 2%. The specific values of the levels of significance should be indicated in the description of the method by which the measurements were carried out.

1.3. In determining the confidence limits of the error in the measurement result the confidence coefficient P should be taken as equal to 0.95.

In cases where the measurement cannot be repeated it is admissible to indicate limits for a confidence coefficient P = 0.99, in addition to the limits for P = 0.95.

In special cases, e.g. measurements whose results are of significance for public health, a higher confidence coefficient than P = 0.99 may be used.

2. THE MEASUREMENT RESULT AND THE EVALUATION OF ITS STANDARD DEVIATION

2.1. Methods of detecting crude errors should be indicated in the description of the method by which the measurement was performed.

If the observation results can be considered to follow a normal distribution, crude errors should be eliminated in accordance with GOST 11.002-73.

2.2. The result of the measurement is taken to be the arithmetic mean of the observation results to which preliminary corrections to eliminate systematic errors have been applied.

Note: If all the observation results contain a constant systematic error, it may be eliminated after calculation of the arithmetic mean of the uncorrected observation results.

2.3. The standard deviation σ of the observation result should be evaluated in accordance with Section 1 of GOST 11.004-74.

2.3.*/ The standard deviation $\sigma(\tilde{A})$ of the measurement result should be calculated by means of the formula

$$S(\tilde{A}) = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \tilde{A})^2}{n(n-1)}},$$

where x_i is the i-th observation result;

$\tilde{A}$ is the measurement result (arithmetic mean of the corrected observation results);

n is the number of observation results;

$S(\tilde{A})$ is an estimate of the standard deviation of the measurement result.

3. CONFIDENCE LIMITS OF THE RANDOM ERROR IN THE MEASUREMENT RESULT

3.1. The confidence limits of the random error in the measurement result are established, in accordance with the present standard, for observation results following a normal distribution.

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*/ Note by Division of Languages - the paragraph number is repeated.

If this condition is not satisfied, the method of calculating the random error confidence limits should be indicated in the description of the method by which the actual measurements were performed.

3.1.1. If the number of observation results $n > 50$ it is best to use either Pearson's χ^2 or the ω^2 of von Mises-Smirnov as criteria for determining whether they follow a normal distribution in accordance with GOST 11.006-74.

3.1.2. For a number of observation results $50 > n > 15$ it is preferable to use the composite criterion given in Appendix 1 to determine whether the distribution is normal.

If the number of observation results $n \leq 15$, they are not tested for normal distribution. In this case finding the confidence limits for the random error in the measurement result by the method outlined in the present standard is possible only if it is known in advance that the observation results are normally distributed.

3.2. The confidence limits ε (irrespective of their sign) for the random error in the measurement result are found by the formula

$$\varepsilon = tS(\tilde{A})$$

where t is Student's coefficient, which may be found from the table in Appendix 2 as a function of the confidence coefficient P and the number of observation results n.

4. CONFIDENCE LIMITS FOR THE UNELIMINATED SYSTEMATIC ERROR IN THE MEASUREMENT RESULT

4.1. The uneliminated systematic error in the measurement result consists of components which may represent uneliminated systematic errors due to:

The method; or to

The measuring equipment or to other sources.

As limits for the components of the uneliminated systematic error it is possible to use, for instance, the limits of the admissible main and subsidiary errors in the measuring equipment, provided that the random components of the error are negligibly small.

4.2. When the components of the uneliminated systematic error in the measurement result are added, the uneliminated systematic errors in each type of measuring equipment and the errors in the corrections should be treated as random quantities. In the absence of data on the type of distribution of the random quantities, their distributions should be treated as uniform.

4.3. The limits of the uneliminated systematic error Θ in the measurement result are calculated by plotting a composition of the uneliminated systematic errors in the measuring equipment and method and of the errors due to other sources. If the uneliminated systematic errors are distributed uniformly, these limits (irrespective of the sign) can be calculated from the formula

$$\Theta = k \sqrt{\sum_{i=1}^{m} \Theta_i^2}$$

where Θ_i is the limit of the i-th uneliminated systematic error;

k is a coefficient determining the confidence coefficient adopted. It is taken as equal to 1.1 for a confidence coefficient P = 0.95.

For a confidence coefficient P = 0.99 the coefficient k is taken equal to 1.4 if the number of uneliminated systematic errors to be added is greater than 4 ($m > 4$). If this number is 4 or less ($m \leqslant 4$), k is determined from the dependence graph (see diagram)

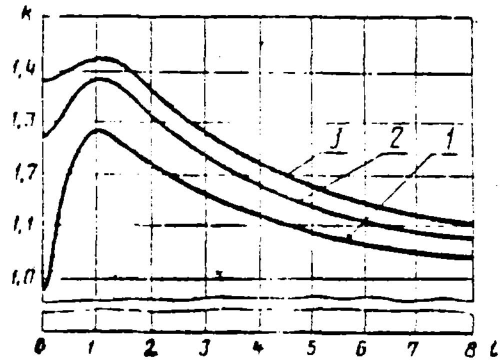
$$k = f(m, \ell)$$

where m is the number of errors to be added;

$$1 = \frac{\Theta_1}{\Theta_2}; \text{ curve (1) } m = 2; \text{ curve (2) } m = 3; \text{ curve (3) } m = 4.$$

In the case of three or four addends, the component differing most from the remainder in numerical value is used as Θ_1, and the component nearest to Θ_i is used as Θ_2.

In calculating the limits for an uneliminated systematic error the same confidence coefficient is taken as in calculating the confidence limits for the random error in the measurement result.



Graph of the dependence $k = f(m, \ell)$

5. LIMIT OF ERROR IN THE MEASUREMENT RESULT

5.1. In the case where $\frac{\Theta}{S(\tilde{A})} < 0.8$ the uneliminated systematic errors, as opposed to random errors, are ignored and it is assumed that the limit of error in the result $\Delta = \varepsilon$. If $\frac{\Theta}{S(\tilde{A})} > 8$, the random error, as opposed to the systematic errors, is ignored and it is assumed that the limit of error in the result $\Delta = \Theta$.

Note: The error due to neglecting one of the components of the error in the measurement result will not exceed 15% if the inequalities given above are satisfied.

5.2. If the inequalities in Section 5.1 are not satisfied, the limit of error in the measurement result is found by plotting a composite distribution of the random and uneliminated systematic errors considered as random quantities in accordance with Section 4.3. If the confidence limits of the random errors are obtained in accordance with Section 3 of the present standard it is permissible to calculate the limits of error of the measurement result Δ (irrespective of the sign) from the formula

$$\Delta = KS_{\Sigma}$$

where K is a coefficient depending on the ratio of the random to the uneliminated systematic error;

S_{Σ} is an estimate of the total standard deviation of the measurement result.

The estimated total standard deviation of the measurement result is calculated from the formula

$$S_\Sigma = \sqrt{\sum_{i=1}^{n} \frac{\theta_i^2}{3} + S^2(\tilde{A})}$$

The coefficient K is calculated from the empirical formula

$$K = \frac{p + \theta}{S(\tilde{A}) + \sqrt{\sum_{i=1}^{m} \frac{\theta_i^2}{3}}}$$

6. FORM OF NOTATION OF THE MEASUREMENT RESULTS

6.1. The format of the measurement results should follow GOST 8.011-72. If the confidence error is symmetrical, the measurement results are represented in the form:

$$\tilde{A} \pm \Delta, P$$

where $\tilde{A}$ is the measurement result.

The numerical value of the measurement result must end with a digit of the same order as the value of the error Δ.

6.2. In the absence of data on the type of distribution function of the error components in the result, if there is a need for further processing of the results or error analysis, the measurement results are presented in the form

$$\tilde{A};\ S(\tilde{A}),\ n;\ \theta.$$

In a case where the limits of the uneliminated systematic error are calculated in accordance with Section 4.3, the confidence coefficient P should also be indicated.

Notes:

1. Estimates of $S(\tilde{A})$ and θ may be expressed in absolute or relative form.

2. Definitions of the terms encountered in this standard are given in Appendix 3.

APPENDIX 1

TESTING FOR NORMAL DISTRIBUTION OF THE OBSERVATION RESULTS IN A SET

For a number of observation results $n < 50$ the normality of the distribution is tested by means of a composite criterion:

Criterion 1: Calculate the ratio $\tilde{d}$

$$\tilde{d} = \frac{\sum_{i=1}^{n} |x_i - \tilde{A}|}{nS^*}$$

where S^* is a biased estimate of the standard deviation calculated from the formula

$$S^* = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \tilde{A})^2}{n}}$$

The observation results in a set can be considered normally distributed if

$$d_{1-q_1/2} < d \lesssim d_{q_1/2}$$

where $d_{1-q_1/2}$ and $d_{q_1/2}$ are quantiles of the distribution obtained from Table 1 for n, $q_1/2$ and $(1 - q_1/2)$, where q_1 is a previously selected level of significance of the criterion.

Table 1

Statistic d

n	$q_1/2$ 100 %		(1−q_1/2) 100 %)	
	1 %	5 %	95 %	99 %
16	0,9137	0,8884	0,7236	0,6829
21	0,9001	0,8768	0,7304	0,6950
26	0,8901	0,8686	0,7360	0,7040
31	0,8826	0,8625	0,7404	0,7110
36	0,8769	0,8578	0,7440	0,7167
41	0,8722	0,8540	0,7470	0,7216
46	0,8682	0,8508	0,7496	0,7256
51	0,8648	0,8481	0,7518	0,7291

Criterion 2: The observation results may be considered to follow a normal distribution if not more than m differences $|x_i - \tilde{A}|$ exceed a value $z_{P/2}S$, where S is an estimate of the standard deviation calculated from the formula

$$S = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \tilde{A})^2}{n-1}} .$$

where $z_{P/2}$ is the upper quantile of the distribution of a normalized Laplace function satisfying the probability P/2.

The values of P are determined from Table 2 in relation to a selected level of significance q_2 and a number of observation results n.

For levels of significance differing from those given in Table 2 the value of P is found by linear interpolation.

In the case where the normality of the distribution of the observation results of the set is tested with a significance level q_1 for criterion 1, and q_2 for criterion 2, the resulting level of significance for the composite criterion is $q \leqslant q_1 + q_2$.

Even if only one of the criteria is not observed, it is considered that the observation results in the set are not distributed normally.

Table 2

Values P for calculating $z_{P/2}$

n	m	q2 100 %		
		1 %	2 %	5 %
10	1	0,98	0,98	0,96
11-14	1	0,99	0,98	0,97
15-20	1	0,99	0,99	0,98
21-22	2	0,98	0,97	0,96
23	2	0,98	0,98	0,96
24-27	2	0,98	0,98	0,97
28-32	2	0,99	0,98	0,97
33-35	2	0,99	0,98	0,98
36-49	2	0,99	0,99	0,98

APPENDIX 2

Value of the coefficient t for a random quantity Y having Student's distribution with n-1 degrees of freedom

n-1	P-0.95	P-0.99	n-1	P-0.95	P-0.99
3	3,182	5,841	16	2,120	2,921
4	2,776	4,604	18	2,101	2,878
5	2,571	4,032	20	2,086	2,815
6	2,447	3,707	22	2,074	2,819
7	2,365	3,499	24	2,064	2,797
8	2,306	3,355	26	2,056	2,779
9	2,262	3,250	28	2,048	2,763
10	2,228	3,169	30	2,043	2,750
12	2,179	3,055	∞	1,960	2,576
14	2,145	2,977			

A P P E N D I X 3

TERMS USED IN THE STANDARD AND THEIR DEFINITIONS

Uncorrected observation result - the observation result before the application of corrections to eliminate systematic errors.

Corrected observation result - the observation result obtained after applying corrections to the uncorrected observation result.

Uncorrected measurement result - the arithmetic mean of observation results before the application of corrections to eliminate systematic errors.

Corrected measurement result - the measurement result obtained after applying corrections to the uncorrected measurement result.

Set of observation results - the totality of observation results obtained under the conditions required, in accordance with the purpose of the measurement, to obtain a measurement result of a given accuracy.

Uneliminated* systematic error in the measurement result - systematic error remaining uneliminated from the measurement result.

*/ Translator's Note: Russian original says "eliminated" here.