**PL SM 7.6-01-2022**

**POLICY ON METHODS VALIDATION**

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*This document defines the policy of the Republican Unitary Enterprise "* *Belarusian State Centre for Accreditation" (hereinafter - BSCA, accreditation body) regarding the validation of methods used in testing and medical laboratories (hereinafter - laboratories).*

By adopting this Policy, the main goal is realized related to the need to establish harmonized approaches and requirements when conducting method validation in accordance with clause 7.2.2 of GOST ISO/IEC 17025-2019 (ISO/IEC 17025:2017, IDT), clause 5.5.1 of STB ISO 15189-2015 (ISO 15189:2012, IDT) (hereinafter referred to as the basic standard).

The policy has been developed considering the provisions of the Eurachem Guide “The Fitness for Purpose of Analytical Methods - A Laboratory Guide to Method Validation and Related Topics (Second edition 2014)".

The Policy applies the terms and definitions established in the fundamental standards.

**1. GENERAL**

**1.1** The policy applies to the activities of applicants for accreditation and accredited entities.

**1.2** Monitoring the implementation of this policy is carried out by the accreditation body when assessing the competence of laboratories.

**1.3** Validation (procedure and obligation) can also be regulated in accordance with the requirements of current regulatory legal acts, technical regulatory legal acts in the field of ensuring uniformity of measurements, conformity assessment and product quality control, adopted by republican government bodies, departments, international organizations (including Eurasian Economic Union).

Where specified regulatory bodies/organizations establish specific validation requirements (e.g., regulations, etc. ) , compliance with such validation requirements should be regarded as meeting the requirements of the underlying method validation standard.

**1.4** The laboratory must validate the following methods:

- non-standard;

- methods developed by the laboratory;

- standard methods used outside their scope or otherwise modified;

- standard methods in which metrological characteristics are not established.

A standard method should be understood as a procedure for research (testing) and measurements, defined in a publicly accessible form and published as an international, regional or state standard.

If standard methods in a laboratory are adapted and applied as a method for a different application (other objects, matrix) or other different requirements or testing and measurement conditions that are not listed in the original scope of the standard method, then such methods should be classified as modified standard methods.

**1.5** Validation of methods that have undergone metrological assessment in accordance with the legislation in the field of ensuring the uniformity of measurements, as well as methods approved for use on the territory of the Republic of Belarus under the recognition procedure in accordance with PMG 44-2001 “Procedure for the recognition of measurement methods,” is not carried out.

**1.6** If the laboratory uses standard methods and methods specified in clause 1.5 of this Policy, it may not validate them. However, the laboratory must verify the performance of the method according to the requirements of the underlying standard.

Verification is carried out in the following cases:

- before introducing methods into operation, the laboratory must confirm that it can properly apply the selected methods to ensure the required performance;

- when changes are made to the method by the development organization, verification must be repeated to the required extent;

- in the event of significant changes, for example, when replacing measuring equipment with similar new ones, moving equipment, updating software, etc.;

changes in the characteristics of the method used are detected during intra-laboratory quality control;

- in the cases listed in Table 1 of this Policy.

The laboratory must maintain verification records (for example, a “method verification report/act” with the date of introduction of the method into laboratory activities, permission of personnel to conduct research (tests) and measurements)).

**2. SCOPE OF METHODS VALIDATION**

**2.1** A number of general important (primary) aspects related to determining the scope of method validation are given in Table 1. The scope of validation in general and the scope of assessment of individual characteristics of the method should be established by the laboratory depending on the specific situation, taking into account the specific application of the method, adaptation to the needs of the customer and legal requirements.

Table 1 – Scope of method validation in various situations:

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| No. | Test method | Scope of Validation |
| 1) | Method developed by laboratory | Validation of the method for all characteristics of the method: the laboratory must take into account all acceptable characteristics of the method (see paragraph 2.3). |
| 2a) | A method developed by a professionally experienced organization, and/or published in scientific and other publications, and/or specified by the equipment manufacturer, but lacking important characteristics | Validation of the method for all characteristics of the method: the laboratory must take into account all acceptable characteristics of the method (see paragraph 2.3). |
| 2b) | A method developed by a professionally experienced organization, and/or published in scientific and other publications, and/or established by an equipment manufacturer, with specified method characteristics | The laboratory must verify its ability to perform the method in relation to the specified characteristics.  The laboratory should evaluate the need to validate any characteristics. |
| 3a) | The method is standardized, but validation data is not available | The laboratory should evaluate the need to validate those characteristics that are critical to the application of the method.  At a minimum, the laboratory must document its ability to perform the method based on its application and customer needs. |
| 3b) | The method is standardized and published as an international, regional or state standard | The laboratory must verify its ability to implement the specified method characteristics. It is assumed that all acceptable characteristics of the method have been investigated (tested) and measured during the standardization process. |
| 4) | A method widely used in research (testing) and measurement (see points 2b) or 3b), but used with modification | The laboratory shall conduct and document an assessment of the potential impact of a change to a method on its performance. If such an influence is established, then the characteristics of the method under consideration must be validated.  The laboratory must verify its ability to perform the method in relation to the specified characteristics. original method. |
| 5) | Expanding the range of studies (tests) and measurements of a method already validated and approved for use in the laboratory | The laboratory must examine (test) and measure, and validate for a new range of examinations (tests) and measurements the accuracy and precision of the method. |
| 6) | Switching from equipment to new equipment, but with the same measurement principle | The laboratory must verify the test and measurement range, linearity, detection limit, accuracy and precision of the method using new equipment. |
| 7) | Expanding the list of matrix types (objects) | The laboratory must investigate and validate for a new type of matrix (object), the accuracy and precision of the method |

**2.2** For validation, one of the following methods or a combination of them can be used:

- assessment of bias and precision using standards, standard samples;

- systematic assessment of factors influencing the result;

- checking the stability of the method by changing the controlled parameters;

- comparison with results obtained using other validated methods;

- interlaboratory comparisons;

- assessment of measurement uncertainty associated with the results of research (tests) and measurements, based on an understanding of the theoretical principles of the method and experience in its implementation when selecting samples or conducting research (tests) and measurements.

**2.3** Depending on the research (testing) and measurement task being solved, the intended scope and conditions of application of the method for validation, the main characteristics of the method used to determine its suitability are selected (the list is not limited and should not be considered as a strict requirement that must always be met ):

- range of research (tests) and measurements;

- accuracy;

- uncertainty of measurement results;

- detection limit;

- limit of quantitation;

- selectivity of the method (selectivity, specificity);

- linearity;

- repeatability or reproducibility;

- resistance to external influences or effects of the influence of the matrix of the sample or the test object;

- offset.

**2.4** The characteristics selected for method validation should be determined and assessed, guided by (not limited to) generally accepted practice (for example, the requirements of STB ISO 5725 “Accuracy (correctness and precision ) of measurement methods and results”, parts 1, 2, 3, 4, 5 , 6, GOST R 50779.42-99 "Statistical methods. Shewhart control charts").

**3. DOCUMENTATION, PLANNING AND REPORTING OF VALIDATION**

**3.1** Validation should, as a minimum, cover the following steps:

1) analysis by the laboratory of legal or customer requirements for a specific task of research (testing) and measurements;

2) validation planning: determining the characteristics of the method in relation to the relevant legal or customer requirement;

3) determining whether the requirements can be met using a method with the specified characteristics;

4) conclusions about the suitability of the method for a specific application.

**3.2** Documentation of the validation procedure.

The laboratory shall have one or more documented procedures that define the laboratory's approach to performing validation work. Such procedures should, at a minimum, contain laboratory guidelines and instructions for:

- appointment of a person responsible for method validation;

- establishing the scope of validation in relation to the legal or customer requirements under consideration for a specific research (testing) and measurement task;

- drawing up (executing) a validation report with a description of the validation work;

- formulating final conclusions about the suitability of the method for a specific application.

Different validation procedures may be necessary (suitable) for different studies (tests) and measurements.

**3.3** For each validation exercise, the laboratory shall develop and document a method validation plan that includes:

- list of studied (tested) and measured characteristics of the method;

- objects/matrices that will be analyzed;

- volume of experiments;

- personnel and timing of experiments;

- statistical analysis that will be used to process the results;

- evaluation of the method as suitable for a particular application.

If there are specific legislative provisions, incl. industry requirements for method validation, the laboratory must take these requirements into account when planning validation.

**3.4** The laboratory shall define documented validation reporting. Such reporting for each validation activity shall contain at least the following information:

- Application area. The laboratory should provide concise and unambiguous information about the scope of the method and a brief description of it, and provide information about the status of the method (for example, modified international standard, method developed in the laboratory, etc.), the quantity being tested (tested) and the measured quantity, unit of measurement, etc.

- Planning. This section should indicate the scope of validation, for example: full validation of the method, validation of any characteristics of the method, expansion of the scope of the method, etc. It is necessary to indicate a list of characteristics that will be studied (tested) and measured, as well as those responsible for conducting validation experiments, and the date(s) of validation.

- Characteristics. This section should provide a brief explanation of the characteristics, the acceptance criteria, a description of the planned experiments, and the methodology for evaluating the results. The results and conclusions based on the results of the experiments should be given. Each investigated (tested) and measured characteristic of the method should be described separately.

- Conclusions. This section should provide the results of the validation work and the results of studies (tests) and measurements. Conclusions regarding regular application of the method, internal and external quality control can be presented . There must be a conclusive conclusion about the suitability of the method for a particular application.

**3.5** The validation report should be signed by the person designated as responsible for method validation and kept in the laboratory as part of the documentation for the method under review. In addition, the laboratory must maintain the following validation records:

— the validation procedure applied;

- a list of legal or customer requirements for a specific task of research (testing) and measurements;

- validation plan.

**4. COMPETENCE OF LABORATORY PERSONNEL**

The laboratory should have designated individuals responsible for performing validation work based on documented knowledge and experience, including:

- technical (theoretical and practical) knowledge in the field of research (testing) and measurements;

- understanding the intended use of the method;

- knowledge of the validity and principles of the method.

The determination of the suitability of a method for a particular application is the responsibility of the person designated as responsible for performing the validation work.

In this case, part of the work on validation experiments can be transferred to other competent personnel in the laboratory.