

2 Quality management system

2.1 Quality policy

Mission

With its more than 130 years of tradition, PTB is one of the largest and most important national metrology institutes in the world. Together with its employees, it assumes the highest responsibility in the field of metrology, in particular in Germany, but increasingly also in Europe and worldwide.

Derived from the fundamental responsibility of the state for the uniformity of metrology, the tasks of PTB are based on the Basic Law. The specific mission entrusted to PTB by the state is to provide an internationally accepted, efficient metrological infrastructure similarly for society, the economy and trade. The tasks of PTB result from its charter ([Charter of PTB](#)). They are based on [laws, ordinances and directives](#) and are in the interest of the economy, science and the public. PTB comes under the auspices of the Federal Ministry of Economy and Energy.

Fields of business

From its mission, PTB derives four interlinked fields of business:



- ⇒ **Fundamentals of metrology**
with the aim of realizing and disseminating the units
- ⇒ **Metrology for economy**
with the aim of increasing the performance of economy and assuring employment
- ⇒ **Metrology for society**
with the aim of promoting consumer protection and safeguarding the living conditions
- ⇒ **International affairs**
with the aim of removing technical barriers to trade and unifying metrology

Figure 2.1.1: Fields of business and activities of PTB

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Activities

The main activities in PTB's fields of business are **research and development, measurements** and the rendering of **advice**. By means of **success indicators (ratios)** which are related to the respective special field, it is estimated - for the purpose of **strategic planning** - whether these activities have achieved their aim.

Research and development serve PTB's ability to perform the whole spectrum of its tasks with the required competence. Whereas research is characterized at PTB by the search for future metrological methods with an open result, development is characterized by a specific problem solution on the basis of available basic knowledge, in particular regarding the further development of standards and measuring methods. At PTB, the focus is thereby on development.

Success indicators

- number of publications
- third-party revenues
- number of third-party projects
- number of patents and licenses
- number of doctoral students/guest scientists

The "Ethic commission of PTB" was founded. The task of commission are the judgement of research plans at the man or research in this area with regard to her ethical, to her legal aspects as well as the dual application for useful and harmful purposes (dual-use-problematics) and the advice of the responsible researchers.

"Measurement" means the calibration and testing of measuring instruments, devices, facilities etc. or of materials by traceability to national standards. This also includes tests prescribed by law, approvals and permits.

Success indicators

- number of successfully completed national and international comparison measurements
- number of the measuring and calibration capabilities (CMC) recognized within the scope of the [CIPM-MRA](#)
- revenues from calibrations for external parties
- revenues from tests and approvals for external parties

"Advice" is rendered to the different target groups in the areas associated with the services of PTB. This includes: the participation of PTB in national and international organizations and boards; participating in the drawing-up of drafts of laws and other regulations, standards and directives; participating in the technical cooperation of the federal government with developing countries; and - last but not least - reporting on the activities of PTB.

Success indicators

- number of organized seminars and meetings with external participants
- number of assessments performed by PTB employees for accredited laboratory and verification authorities
- number of assessments of manufacturers and testing laboratories performed by PTB employees

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- number of assessments of other national metrology institutes performed by PTB employees
- number of boards (national/international incl. standardization) in which PTB employees participate

Missions and quality objectives

On the basis of the mission entrusted to PTB by law, and on the basis of the most recent **Objectives agreed upon with the Federal Ministry of Economic Affairs and Climate Action**, the quality policy and the quality objectives are determined interdisciplinarily by the President of PTB and agreed with the individual divisions/bodies. In his task, the President is supported by the Board of Consultants, as well as by the panels and committees specified in the **Statutes of PTB** and Annexes.

The task-specific objectives are specified and are laid down bindingly in the respective parts of the quality manuals of the individual divisions/bodies of PTB.

In order to be able to implement the quality objectives, technically competent, impartial, independent, motivated employees with integrity are required. The employees of PTB have laboratories and an infrastructure with modern equipment at their disposal which meets the requirements of DIN EN ISO/IEC 17 025 or DIN EN ISO 17 034 regarding chemical reference materials. An adequate provision with staff and material is the prerequisite for successful work and for the achievement of the set quality aims. Every employee is responsible for the quality of the results of his work. A top management task is to raise the staff's awareness for quality.

By order of the Presidential Board, the committees "Staff", "Investments", "IT infrastructure", "Metrological Services", "International Cooperation", "Quality Management" and "Research Programmes" check the compliance of PTB's work with the formulated principles at regular intervals and report about it. The structure is supplemented by the innovation clusters "Digitalization", "Energy", "Health", "Energy", "Quantum technology", "Systems Metrology" and "Environment and Climate". The committees and innovation clusters support the effectiveness of the available resources for the further development of the of the PTB's offered services.

Generally, in all fields of business and activity, PTB's quality policy aims at achieving the following quality objectives:

- ⇒ PTB operates a quality management system which meets the legal requirements (see [Annex 6.2](#)), the requirements of DIN EN ISO/IEC 17 025 and, thus, the principles of DIN EN ISO 9001 and makes it transparent to third parties in accordance with national or international agreements.
- ⇒ All fields of activity of PTB comply with the guidelines of the Deutsche Forschungsgesellschaft (DFG - German Research Association) to ensure good scientific practice.
- ⇒ The quality management system is subjected to an integrated self-assessment ("review") process with the aim of constant improvement, whereby the customers and partners are included in the strategic planning processes.
- ⇒ In addition, for selected activities, the requirements of DIN ISO 17 034 and DIN EN ISO/IEC 17 065 respectively, are integrated into the quality management system.
- ⇒ Only in cases in which the legislator explicitly prescribes a certification of the management system or an accreditation, PTB will supply the respective evidence. PTB uses the [Self-declaration on quality management](#) as an advanced instrument for confidence building at the national and international level.
- ⇒ PTB aims at performing all tasks to the satisfaction of the circles concerned, in industry, in the economy and in the society, and acts on a customer-oriented basis. This applies to both - the scientific-technical aspects and the handling of the tasks in due time and at fair costs.

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In the intertwined fields of business and activity, PTB's quality policy aims at achieving the following missions and quality objectives:

Fundamentals of metrology

Mission

Setting up the foundation for a national metrology system which meets today's and future requirements

Quality objective

The objective is to realize the legal units with as small an uncertainty as possible, as far as this is demanded by the economy, to develop the national standards and to ensure their international comparability, to disclose the procedures according to which non-materialized units are realized; and to allow the legal units to be disseminated by the traceability of the standards to SI units.

Metrology for economy

Mission

Promotion of science and the economy by research and development, calibration, testing and approval, consultancy and information

Quality objective

By technical developments of standards, standard measuring devices and measuring methods proven in operation and in accordance with the requirements, PTB establishes metrological system solutions for corresponding measurements, calibrations and conformity assessments. For this purpose, it is indispensable to trace all measuring results back to the SI units. By the establishment of an infrastructure of distributed metrological competence and the dissemination of metrological knowledge, PTB considerably contributes to an increase in the performance of economy.

PTB supports the German Verification authorities and the accreditation of conformity assessment bodies by the [Deutsche Akkreditierungsstelle GmbH](#) (DAkkS, German Accreditation Body) and by tracing the reference standards back to the national standards, as far as other competent bodies are not in a position to do so, and promotes the extension of the calibration facilities of the accredited conformity assessment bodies or the accreditation of new conformity assessment bodies in the field of metrology. In this connection, it places qualified experts at the disposal of DAkkS GmbH. As far as its own calibration services for the dissemination of the units are concerned, PTB limits its activities to calibrations which require the highest accuracy or which are characterized by special metrological challenges, and does not compete with other conformity assessment bodies which have been accredited particularly by the DAkkS GmbH.

To promote the coherence in metrology, and with the aim of rendering complementary technical support, a body was created at PTB to elaborate the metrological fundamentals for calibrations. In this body, PTB and the accredited calibration laboratories work together. This body is named [Deutscher Kalibrierdienst \(German Calibration Service – DKD\)](#) and is under the direction of PTB.

Metrology for society

Mission

Provision and use of measuring techniques and procedures in the interest of a fair flow of trade, for the adequate protection of the consumers in commercial and official transactions, of the working population in the professional environment, for the maintenance and recovery of health, for personal and industrial safety, as well as for the protection of nature and the environment

Quality objective

Here, it is a priority objective to set standards - especially in the European market - conserving the high protective targets and the high metrological level of the conformity assessments. In connection with implementing of Measures and Verification Act a [conformity assessment body](#) was joined to PTB.

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International affairs

Mission

Contribution to the international uniformity of metrology and the removal of technical barriers; Support of developing countries and countries in transition in the establishment of their metrological infrastructure

Quality objective

PTB fulfils its mission with the aim of being an internationally leading competence centre for metrology and a sought-after and valued partner of society, the economy and science. By cooperation in the committees of EURAMET, WELMEC, the Meter Convention, OIML and of national and international standardization, PTB enhances the international process for harmonization in metrology and mutual recognition and, thus, protects the interests of politics, the economy and society in Germany. Within the scope of international agreements (e.g. CIPM-MRA, [OIML-CS](#)), PTB subjects itself to a process of international assessment through the scientific-technical community.

Within the framework of development cooperation, PTB promotes the improvement of the framework conditions for economic, social and ecological action and therefore supports developing and emerging countries in the development and use of a needs-based and internationally recognized quality infrastructure.

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