

**Safety is often taken for granted, whether at home, at work or when traveling**

When we eat food, drink water from a tap, switch on an electrical appliance, drive a car or take a plane, our safety depends on the enforcement of safety laws and regulations which have been drawn up and put into place by authorities, regulatory bodies and governments. Safety regulations and laws also ensure that the correct information is published on labels, packaging and instruction manuals.

Regulations may

- set tolerance levels to protect us from ingesting various kinds of harmful substances in food (e.g. heavy metals, pesticides and harmful bacteria),
- specify what materials water pipes may be made of (e.g. lead-free),
- limit the amount of electromagnetic radiation emitted by electrical appliances (e.g. kitchen appliances which generate interference on radios or television sets),
- specify motor vehicle test requirements to ensure roadworthiness (e.g. the concentration of CO in vehicle exhaust emissions).

There are virtually endless practical examples of how accurate measurements are vital in ensuring our safety, ranging from the compatibility of electrical equipment, control of medical devices and instruments, composition of construction materials, etc.

A sound measurement system is an essential element in achieving an effective safety policy. Essential factors for such a system are

- traceability to the International System of Units, or SI (scientific metrology),
- regulated measurements and measuring instruments (legal metrology), and
- confidence in testing and measurement results via certification, standardization, accreditation and calibration (industrial metrology).

At the international level, the national measurement systems must be compatible and harmonized, and mutual confidence and mutual recognitions are necessary. The International Bureau of Weights and Measures (BIPM) helps coordinate arrangements or maintains international reference facilities to ensure the comparability of many of the national measurement standards maintained by the national metrology institutes. The International Organization of Legal Metrology (OIML) works with national legal metrology authorities to develop harmonized regulations on measurements and measuring instruments used to ensure safety.

The International Committee for Weights and Measures (CIPM) and the OIML have respectively created a Mutual Recognition Arrangement (CIPM MRA) and a Mutual

Acceptance Arrangement (MAA) within which international consistency of measurement and testing can be demonstrated.