

Preface

Metrology is an essential part of the infrastructure of today's world. It enters into our lives in a multitude of ways, some direct and some indirect. National and international trade increasingly require demonstrated conformity to written standards and specifications and mutual recognition of measurements and tests. The economic success of most manufacturing industries is critically dependent on how well its products are made, a requirement in which measurement plays a key role. Navigation and telecommunications require the most accurate time and frequency standards. Human health and safety depend on reliable measurements in diagnosis and therapy and in the production and trade in food and food products. The protection of the environment from the short-term and long-term destructive effects of industrial activity can only be assured on the basis of accurate and reliable measurements. Global climate studies depend on reliable and consistent data from many disciplines often over long periods of time and this can be assured only on the basis of measurements traceable to measurement standards that are themselves linked to fundamental and atomic constants.

Metrology is not an activity that is only carried out in specialized institutes or calibration laboratories. In order to meet the needs of society for accurate and reliable measurements in all its many applications, a strong spirit of metrology must also exist in companies and enterprises that make the instruments and that use them to make measurements.

For this reason I welcome this book. It gives a clear outline of the basic ideas of metrology, why we need it and how, in an enterprise it can be practiced. I wish it every success.

T.J. Quinn,
Director of BIPM

Foreword

Technically, economically, commercially and, sometimes, statutorily speaking, having relevant and reliable results of measurements, analyses and tests is a real asset for a firm which wishes to make efficacious decisions.

You cannot achieve such an end if you do not have firm control over the processes of measurement, analysis and testing. Nowadays, however, the measuring techniques, the normative and statutory requirements, the methods of measurement uncertainty assessment or those to secure the traceability of measurements are all complex and it is more necessary than ever to integrate them into a network of competent bodies so as to exchange experience and information. It is on this fundamental principle that the Metrology College was created in 1986, which became the French College of Metrology in 2002. The purpose of this association is obviously much wider:

- to identify which firms and organisms' needs are to be met from the angle of metrology;
- to spread metrological culture and knowledge through the industrial, scientific and economic fabric;
- to be a form of exchange between people involved in metrology;
- to contribute to make the collective national and regional actions coherent in this sphere;
- to perform any action likely to contribute to the development and promotion of metrology.

The permanent evolution of metrology, together with the willingness to impart all the knowledge acquired so far, have led a working party of the French College of Metrology to write a second edition of the book *Metrology in the Firm*. Metrologists from various callings (national metrology laboratories, accrediting organisms,

industrial concerns and consulting firms) and from different nationalities make up this working party. This broad range of authors gives the book a pragmatic characteristic and enables it to answer the questions and concerns of organizations, whether they be principals, small or medium firms, laboratories, etc.

The contribution from foreign authors gives the book an unquestionable international aspect which accurately reflects the current reality. More than ever, as a matter of fact, metrology contributes to the free circulation of goods between countries, thanks to the international organization of metrology and thanks to the international agreements between national metrology laboratories and between accrediting organisms.

Moreover, most of the authors belong to different national or international standardization committees. As a result, the latest normative evolutions are to be found in this book, whether it is the concept of firm certification developed in the 2000 version of standard ISO 9001, or the approach concerning the competence of activities of measurement, testing or analysis as expounded in standard ISO 17025.

Whether you are involved in your firm's metrology function, or are simply interested in a concrete matter of measurement, analysis or testing, I am confident you will find here some clues which will help you progress and improve your processes.

The growing interest you have shown in this book has encouraged us in our intention of producing this English version. It is my sincere wish that whatever your need and country may be, you can get as much out of it as our French colleagues do.

May you enjoy reading it.

P. LEBLOIS,
President of the French College of Metrology