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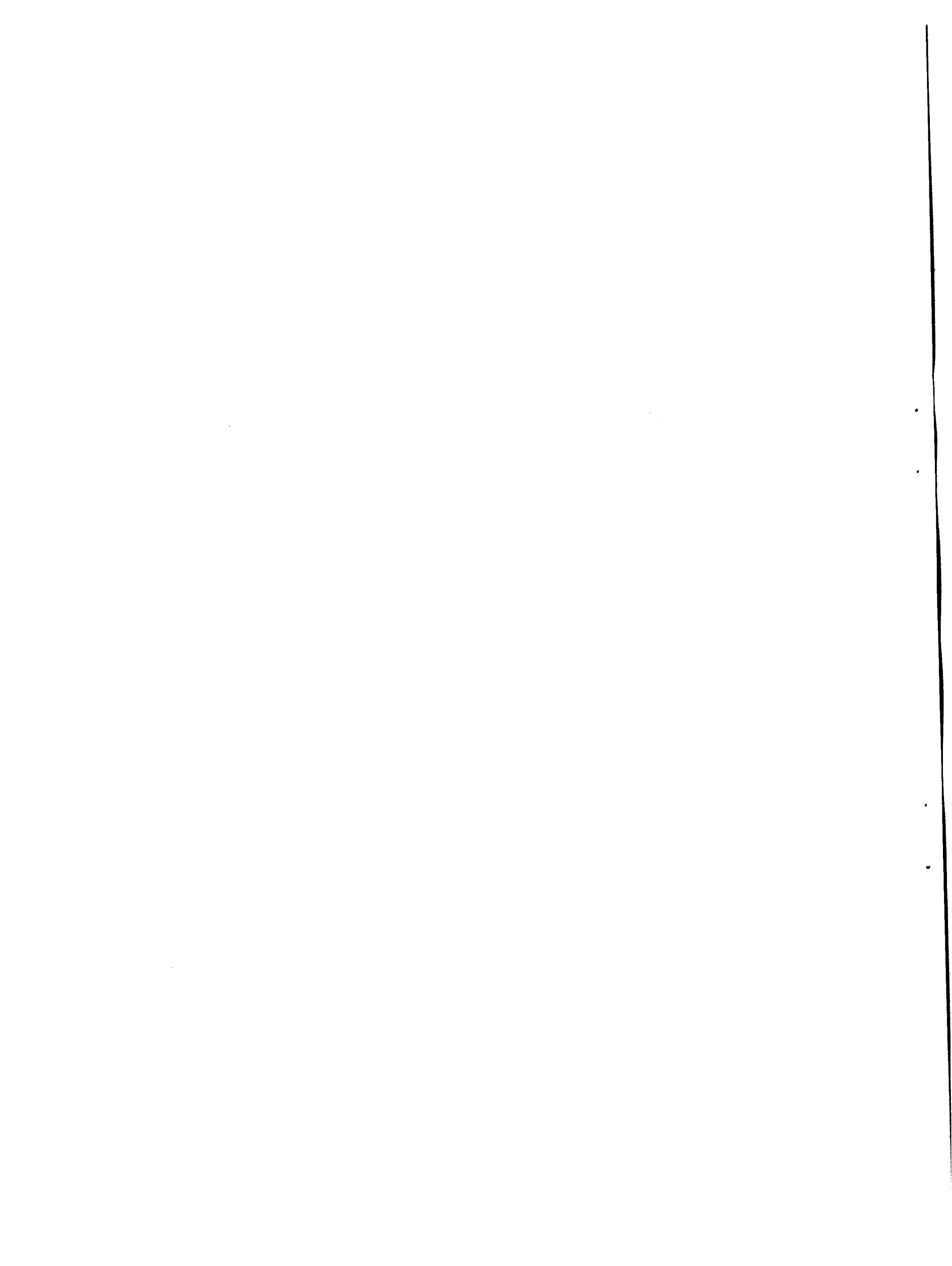
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**THE URGENT NEED FOR AN ARAB METROLOGY PROGRAMME
AND ITS OBJECTIVES**

by

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The urgent need for an Arab Metrology Programme and its objectives

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Abstract

As the trade agreements are increasingly calling upon mutual recognition of measurements and tests, There is an urgent need to establish credibility and confidence in measurement among Arab countries and to gain international confidence and recognition outside the region. Some Arab countries have well-established laboratories, while others are not in a position to develop and maintain fundamental primary standards and indeed, do not require them.

The Arab countries must seek to establish a regional “equivalence” not in the sense of equality between National Metrology Institutes (NMIs), but rather to establish recognition at a level sufficient to support the industrial, scientific and trade requirements of each country.

At a meeting held in Paris in October 1999, the directors of the National Metrology Institutes (NMIs) of thirty-eight member states of the Meter Convention and representatives of two international organizations, signed the mutual recognition arrangement (MRA) for national measurement standards and for calibration and measurement certificates issued by NMIs.

The MRA is open to NMIs of the member states of the Meter Convention and to NMIs of associate states of the general conference of weights and measures (CGPM).

The technical basis of the proposed MRA is a set of key comparisons of national measurement standards identified by the consultative committees of International Committee of Weights and Measures (CIPM), and executed by the International Bureau of weights and Measures (BIPM), the consultative committees and the Regional Metrology Organizations (RMOs).

Almost all NMIs in Arab countries are not members of any Regional Metrology Organization. This makes the fulfillment of technical basis of MRA very troublesome. Therefore, the NMIs in Arab countries are required, more than ever, to play a very active role to:

- Promote the coordination of meteorological activities and services.
- Achieve greater harmony of measurement and testing.
- Build mutual confidence in measurement.
- Establish international confidence and recognition outside the region.

This paper shows that it is completely possible to achieve these goals, as well as many others through an Arab Metrology Programme (AMP).

Keywords: metrology, traceability, mutual recognition.

Introduction

Measurement plays a vital role in almost all-human activities. It also provides the base for fair trading domestically and in the global market place.

The powerful part that metrology plays may be seen from the fact that, depending on the level of its advanced technology a country is, between 3% and 6% of the gross national product (GNP) is contributed by the value of instruments and measurement-related operations [1]. To be meaningful, measurements must be underpinned by metrology.

The requirements for good measurement or measurement assurance are: competence and traceability . Competence relates to the staff undertaking the measurements, their methodology and their system design and best addressed through third-party accreditation to ISO17025 . Measurement traceability relates to the accuracy of the measuring equipment itself. Measurement traceability in a national system is established through an unbroken chain of calibrations, performed by competent laboratories linking workplace measurements to national measurement standards. International mutual confidence in measurement and traceability requires that national systems be linked through comparisons of national standards among NMIs and that the accreditation bodies involved in assessing competence of the calibration in the traceability chain themselves have mutual recognition. [2]

The Mutual Recognition Arrangement (MRA)

At a meeting held in Paris on 14 October 1999, the directors of the national metrology institutes (NMIs) of thirty-eight Member States of the Metre Convention and representatives of two international organizations signed the mutual recognition arrangement (MRA) for national measurement standards and for calibration and measurement certificates issued by NMIs.

The arrangement is in two parts: part one concerns national measurement standards and part two concerns calibration and measurement certificates.

The technical basis of the arrangement is the set of results obtained in the course of time through key comparisons carried out by the consultative committees of the international committee of Weights and Measures (CIPM) , the Bureau international des poids et Mesures (BIPM) and the regional metrology organizations (RMOs) , and published by the BIPM and maintained in the key comparison database.

The MRA is open to the NMIs of the Member States of the Metre Convention, to certain international and intergovernmental organizations invited by the CIPM and to the NMIs of Associates States and Economies of the General Conference of Weights and Measures (CGPM) [3].

Implication of the MRA for the Arab countries

The MRA is an essential and timely step forward towards a truly global metrology system.

Competence of the NMIs has been traditionally demonstrated through publication of the results of comparisons, and through contribution to fundamental metrology. Well-established laboratories have developed reputation for competence based on contributions over a century or more of continuous effort. As NMIs in the Arab region are newly – established, with limited exception, their measurement standard, are only recognized within national borders.

This MRA is clearly essential for regional and international acceptability of the Arab countries measurement standards and conformance infrastructures and for the regional and international trade that relies on this acceptability.

There are clearly significant advantages and benefits, but they come at a price. The national measurement system must meet the requirements of the MRA and the system will be seen for what it is. This places considerable pressure on NMIs, in Arab region particularly; to ensure that their national standards are appropriate and that the necessary secondary standards and calibration systems are in place to ensure credibility for their calibration certificates.

The requirements that NMIs must satisfy form an extensive list:

- Tens of regional key comparisons with typical repeat interval of five years to ten years.
- Tens of supplementary comparisons.
- Third-party accreditation to ISO 17025.
- Re-assessment each time a NMI wishes to introduce a new or improved measurement capability for each field.

Although financial and technical burden to satisfy those requirements are very high, the most critical obstacle will be to find timely adequate possibility to participate in regional key and supplementary comparison for two reasons: almost all NMIs in Arab countries are not members of any regional metrology organization and even if they decide to be members the repeatability of such comparison is not less than five years.

For these reasons, I believe the only effective way of fulfilling the requirements of the MRA, as well as many others, is through establishing an Arab Metrology programme (AMP).

The regional challenge for the proposed Arab metrology programme (AMP)

The Arab countries have different metrological requirements, few countries have well established laboratories while others are not in a position to develop and maintain fundamental primary standards and, indeed, many do not require them. AMP will not seek to establish broad-based regional equivalence, in the sense of equality between NMIs, but rather to establish recognition at a level sufficient to support the industrial and trade requirements in the region. Demonstration of this capability is of prime importance for AMP, in order to establish credibility and confidence in measurements among Arab countries and to join international acceptance and recognition outside the region. To attain this objective AMP should establish inter-comparison programs which satisfy the regional requirements and provides metrological links with other major regional bodies as EUROMET (European Collaboration in Measurement Standards), SADC MET (Southern African Development Community Cooperation in Measurement Traceability) and APMP (Asia-Pacific Metrology Program) [4].

The Proposed Objectives of AMP

The Members intend to collaborate to promote the coordination of metrological activities and services in order to achieve greater harmony of measurement and testing within the Region and build mutual confidence in measurement between members. Specific objectives are:

- a) To develop a closer collaboration between Members in work on measurement standards within the Region.
- b) To improve the level of metrology, and to gain international recognition for Members.
- c) To encourage traceability between Members through the provision of calibration services.
- d) To ensure that measurement standards within the Region are traceable to standards maintained or coordinated by the International Bureau of Weights and Measures (BIPM) in the realisation of the international system (SI) of units, and to generally reinforce the objectives of the Metric Treaty.

In pursuit of these objectives AMP will seek to:

- a) Coordinate projects on measurement standards and foster cooperation in research between Members,
- b) Transfer expertise in all metrological fields specially in the field of primary or peak standards between Members through seminars, conferences, workshops, training programs, consultancies and technical publications.
- c) Encourage and facilitate collaboration among interested Members on specific projects.
- d) Initiate inter-laboratory comparisons of measurement standards in order to gain international recognition of measurement capabilities of Member laboratories.

- e) Encourage participation in BIPM key comparisons and at all times ensure that AMP inter-laboratory comparison activity does not impede access to inter-laboratory comparisons coordinated by the BIPM.
- f) Maintain an up-to-date database of services and capabilities available within the Region.
- g) Establish and maintain effective links with other international and region-based metrological bodies, eg , BIPM, the European Collaboration in Measurement Standards (EUROMET), and the Asia-Pacific Metrology Programme (APMP).
- h) Collaborate with other bodies within the Region that are active in standards, testing and conformance.
- i) Develop and maintain a multilateral Mutual Recognition Agreement (MRA) among Members.
- j) Undertake other activities as decided by Members from time to time.

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Conclusion

Metrology is essential to underpin testing, conformance and international trade. Mutual recognition of national measurement standards and the competence of NMIs is a necessary condition for international traceability. The arab countries are certainly preparing their NMIs to entering into the global MRA. To fulfil the requirements of the MRA there is a need for participation in comparisons and accreditation programs making the mean time needed to fulfil those requirements not less than seven years. The immediate benefit of the proposed AMP would be to shorten the period to reduce the cost and to share the expertise among NMIs in arab countries.

