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## EXPERIENCES OF SETTING-UP INSTRUMENTATION CENTRE AT KENYA BUREAU OF STANDARDS

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**Abstract** - The modern industry, Metrology and Testing laboratories have diverse types of measuring instruments which range from simple to very complex computer-aided measuring systems reflecting the state of art.

The Instrumentation Centre plays a vital role to Quality of measurement results, products, services and contributes to over-all economy of a country.

To maintain an instrumentation centre in a health state; an efficient, qualified, well-trained team coupled with modern business management skills is not only necessary but a must.

This paper will address the ‘experiences of setting-up an instrumentation centre at Kenya Bureau of Standards’ and the challenges faced, the way forward and its upgrading to be a ‘Regional Instrumental Centre’.

Key words: maintenance, repair, instrumentation

### 1. INTRODUCTION

The need for accurate reliable measuring instruments in metrology, testing houses and in manufacturing industries cannot be over emphasized since institutional budget allocations to this item are enormous.

In developed world, big annual budgets are set aside for acquisition of modern measuring instruments and in research for new measurement techniques and development of modern instruments utilizing the basic principles of science. It is even not wrong to say that, development of a country can be quantified in terms of how sophisticated the measurement system it has and the size of budget allocated to development of measuring instruments.

Kenya is a developing country and like many countries in this category, the national budget has deficit and allocation budget for development of instrumentation hardly exist despite having test laboratories and firms utilizing measuring equipment. The instrumentation laboratory at the Kenya Bureau of Standards was set-up for the purpose of maintenance and repair of KEBS metrology, testing and material laboratories, which have quite a big number of measuring instruments.

### 2. HISTORY

The Kenya Bureau of Standards metrology, testing and material Laboratories were established in 1982. They were established by a Germany Technical aid through Physikalisch-Technische Bundesanstalt (PTB).

The instrumentation laboratory is one of the laboratories within Metrology Division.

The objectives of setting the instrumentation laboratories were: To maintain and repair measuring equipment, to install new equipment to the laboratories and develop simple circuits for instruments.

The above functions of the instrumentation laboratory were intended to be a support service.

### 3. DEVELOPMENT STAGE

#### 3.1. KEBS Input

In developing the Laboratory, the KEBS was requested to provide the following:

- (i) Staff-The KEBS recruited personnel (2 graduates, 2 technicians) who had basic experience in instrumentation especially (electrical/electronics instruments)
- (ii) Building (room)- The KEBS was to provide laboratory rooms consisting of 1 major room (10m x 10m), 2 rooms (6mx4m) and a mechanical workshop (able to fabricate machines). All the above requirements were in place by the time the laboratory started.

#### 3.2. PTB Input

The PTB provided the following facilities:

Training -The PTB trained, and where necessary sought appropriate training centers for training

Funding -The laboratory was funded fully by PTB, which included: fault diagnostic instruments, repair tool kits, and mechanical workshop machinery.

Experts - Experts in the fields of instrumentation and mechanical technology were attached to KEBS for not less than three years.

### 4. IMPACT OF INSTRUMENTATION LABORATORY

Since the inception of instrumentation laboratory (about 20 years ago) at KEBS and comparing the number of instruments maintained and repaired; we can say with confidence that the laboratory has performed 75% of its repairs successfully and which translates to about 300 [1] instruments yearly.

Secondly, the laboratory has out-stretched its services to the industries and test laboratories in the country. The

laboratory is now recognized for offering competitive and quality services to clients all over Kenya.

## 5. UP-GRADING THE LABORATORY

In year 1999, PTB sent a consultant to evaluate performance of the laboratory in order to make its operations competitive and economically viable.

The consultancy work was executed through the MTA-MMSZ LTD of Hungary under the direction of Mr. Menyhard. The consultant was to address the following pertinent issues: (i) provide communication hot-line, (ii) Introduce online ordering of spares (iii) upgrade the technical staff skills, (iv) maintain common spares stock levels, (v) institute electronic data management (vi) provide minimal diagnostic tools the above tasks were performed satisfactorily and the laboratory was transformed to an instrumentation centre and is now undertaking repairs work in large scale and has the capability to function as a fully pledged 'Regional Instrumentation Centre' with just minimal further investment. During the period the MTA-MMSZ LTD. expert was at KEBS. He set up efficient diagnostic procedures to be followed in repair of equipment. One case in mind is the KEBS force machine, which was lying un-repaired for quite long time and it was fault diagnosed and hope of reviving the machine was rekindled.

## 6. CHALLENGES FACED

### 6.1 Technology

Instrument Technology is ever changing and the instrumentation staff needs to be up-grading their skills often in order to keep-up with new multi-disciplinary measuring equipment coming in the market. The modern communication facilitators e.g. e-mails, fax, etc. have to be used extensively. The communication infrastructure should be in place.

Sometimes the instruments being repaired are of obsolete technology with no spares available and you are left with no choice but to abandon good measuring instruments to waste.

### 6.2 Funding

In order for the instrumentation Centre to start operationing; initial investment in measuring Equipment is a big budget and a good planning is required, keeping in mind that you need funds for salaries, measuring instruments, maintaining stocks levels and communication equipment.

The return from the investment is not immediate and consequently a steady funding is a must initially. The KEBS took care of staff salaries and the running costs.

### 6.3 Poor Publicity

Although the instrumentation center may be offering good services, the centre may not be known because of poor publicity. Initially it was difficult to get clients outside the Kenya Bureau of Standards premises but luckily due to good awareness through seminars, adverts in newspapers, brochures and recently due to ISO 9000 series of standards which are advocating calibration of instruments and as a result maintain it, and repair of measuring instruments is a requirement in order to keep them in their health states.

## 7. RE-ORGANISATION OF THE CENTRE

### 7.1 Management

The Head of Instrumentation Centre is presently reporting to the Head of Metrology Laboratories and it has been proposed to de-link the centre from the metrology division management and to make the Centre autonomous and to re-structure it for effective management as a profit centre with its own budget.

### 7.2 Communication

At present, the Centre is utilizing the IT for all communication purposes including ordering of spares. It has been found out that communication through electronic media by use of e-mails is not only faster but it cuts expenses and is convenient. It is also enabling the staff to search information on instruments from all over the world with ease. Presently we are using electronic communication media for : 1) ordering of spares; 2) search relevant information in instruments; 3) communicating to manufacturers/clients; 4) maintenance of records (inventory, instruments information, customers information etc.).

From our experiences with use of IT, we fill that, it is not only necessary to use it but that you cannot avoid it

#### (i) Repair work

Procurement of spares – The spares available locally have not been much of a problem to us, but spares from foreign countries have been delaying repair work due to our procurement processes which are very cumbersome. With the advent of independence of instrumentation Centre, we hope the procurement process to be efficient.

#### ii) Charges per hour/mean repair time

The instrumentation Centre is changing at the rate of US\$ 19 per hour and operating at the capacity of 50%. The mean repair time of equipment is 4 hours (based on 3 technicians and 5760 working hours per year). The present operational capacity could be improved to 80% and the charge be US\$ 44 per hour respectively in order to be at par with private repair Centres.

#### (iii) Feedback from Clients

At least every quarter of a year a technical officer has been visiting our clients to discuss about the services we are offering and getting feedback from them. The information has been useful in evaluating our effectiveness in response time, charging fee, customer satisfaction and our competence. We have designed an appraisal (feedback) form, which we are going to use it electronically.

## 8. WAY FORWARD

With the advent of ISO 9000 series of standards and automation of measuring and production processes, most companies have opted for contraction of their repair and maintenance services. As a result of this; below are some of challenges the instrumentation Centre is to address.

(i) Choice of fields-The instrumentation centre has to realise that there are diverse measuring instruments and one centre cannot be able to encompass all the fields and should choose the areas to concentrate on.

(ii) Data bank-The instrumentation centre is setting up measuring instruments matrix-containing information on instruments used in the country. This information is intended to be available to instrument users. The centre is also encouraging instrument users to have databases on equipment and to ensure that repair and maintenance manuals and relevant literature is well kept for references.

(iii) Standardization

There is need to standardize the instrumentation industry in order to have universal components. This will assist repairs in ordering spares. We have found out that, some consumable components used in the repair of instruments have no equivalences, and other cannot be purchased elsewhere except from those particular instrument manufacturers who some have either closed business or stopped stocking the same components. Efforts in this field in the Kenya Bureau of Standards have been made by coming up with a standard on ‘General requirements for measuring equipments’ which is supposed give guidelines when ordering equipments.

## 9. CONCLUSION

The KEBS is proud of its Instrumentation Centre because for it has sustained the metrology, testing and materials testing Laboratories equipments in serviceable conditions. The Instrumentation Centre is endeavoring to put in place measures in order to be economically viable enterprise and practice modern business management skills if it has to succeed.

The Centre has so far has sustained a good level of skilled manpower, well-motivated staff with room for improvement. The Center aims at extending its services to the East African countries and to be a ‘Regional Instrument Centre’.

### Abbreviation

KEBS = KENYA BUREAU OF STANDARDS

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