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PART-TIME TRAINING PROGRAMME AND IN-PLANT TRAINING OF TECHNICIANS IN KENYA

Edited by

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1. INTRODUCTION

In the course of describing technician training schemes in Kenya, it is felt necessary to outline their ultimate duties, at the end of their training, so as to clarify the relationship between the schemes and the duties.

1.1 Scope

Although technicians may eventually be upgraded to other designations, details of training schemes above the technician level are excluded.

1.2 Duties

Generally, some of the duties technicians are usually engaged in are: operating, servicing, maintaining and repairing engineering machinery, testing of materials and/or components in laboratories, inspecting testing equipment and machinery, sales engineering and advising customers, experimental work, instructing junior apprentices, installation of machinery, highly skilled craftsmanship, assisting technologists engaged in design and development work, technical drawing, inspecting in-process and finished products, recognizing machining and fitting defects, to appreciate causes, apply preventive action and remedies; assembly, overhauling, using various instruments, supervisory and managerial duties at the senior technician level.

1.3 Types of training

There are two major types of training, namely, academic and practical; but they are interdisciplinary, in that the academic training is always accompanied with practical demonstrations and practical training is always carried out with reference to theoretical aspects. The two types of training are suitable for trainees who have been in school; but the approach to training laymen, who are engaged in various duties in industry, in fairly large numbers, has to be tailored to suit their limited ability to absorb technical or scientific information. Hence their training tends to be much more practically biased, with very little scientific content.

The Government of Kenya therefore produced the Industrial Training Act, which is available from the Ministry of Labour, to cater for the variety of trainees in various establishments, and to make it possible for training programmes to meet the requirements of industries in Kenya, as well as the different groups of trainees.

1.4 The Industrial Training Act

The Industrial Training Act which came into operation in January 1974, is an outline of the national training scheme requirements for training technicians and apprentices. It was introduced to establish national training standards, and reasonably similar duties and working conditions in various establishments. The scheme requires among other things that:

1.4.1 There be interaction between the Director of Industrial Training and Principals of training establishments, to develop suitable courses for the trainees.

1.4.2 The minimum educational qualifications for entry to technician apprenticeship be EABC (O-level certificate), with credits in English, mathematics and appropriate sciences, or suitable qualifications in craft apprenticeships, with outstanding performance.
1.4.3. The first 12 months of technician apprenticeship shall have a strong craft bias, comprising of in-plant training, during the first six months, followed by craft orientation courses in the occupational areas concerned, for 3 months, and a further in-plant training during the last 3 months.

1.4.4 A contract of apprenticeship shall be entered into by every apprentice and his employer in triplicate, to be retained by the trainee, the employer and the director, for record.

1.4.5 The first 6 months shall be a probationary period, after which the candidates for apprenticeship shall enter the training scheme, on successful completion of the probation. At the entry to the scheme candidates shall be assessed to determine their suitability for the training.

1.4.6 Wages paid to the apprentice shall be based on a minimum fixed rate, with appropriate yearly increments.

1.4.7 The apprentice shall attend technician courses at an approved training institution.

1.4.8 The apprentice shall be issued with a log-book to keep a record of his in-plant training.

1.4.9 The employer shall submit reports on the trainee's progress to the director, at the completion of every training stage.

1.4.10 The candidates for the training scheme shall be above 15 years of age and medically fit.

1.4.11 The employer shall ensure that the in-plant training provides the necessary skills and operations, directly related to the duties of the trainees.

1.4.12 The normal training duration is 4 years.

1.4.13 During the fourth (final) year of apprenticeship, following the passing of technician part II examination, the apprentice shall attend a part-time (day release) or a block course, in techniques of supervision and management, at an approved institution.

1.4.14 Proper and efficient supervision direction and control of apprentices and their training, shall be the responsibility of the employer. For this purpose, the employer shall appoint a full-time apprentice master, where the total number of apprentices is twenty-five or more, and a part-time master, where the apprentices are less than twenty-five.

1.4.15 Tests and examinations

The apprentice will be required to take and pass a proficiency test, related to the craft orientation course taken during the first year. A certificate of proficiency shall be issued by the director, to successful apprentices. An apprentice who fails in his proficiency test for the second time, will have his apprenticeship contract terminated. An apprentice who fails only one subject in any of the technician examinations, will be allowed to repeat. An apprentice who fails in one subject twice or in more than one subject at any sitting, may be reverted to craft apprenticeship, or his apprenticeship contract may be terminated. If he fails in only one subject in the final year, the director may extend his training period beyond 4 years to allow him one more sitting.

1.4.16 The employer shall provide the apprentice with personal tools, for the purpose of doing his work. The cost of the tools will be recovered by monthly instalments.
1.4.17 The employer shall be reimbursed for certain training expenses, in addition to the award of a training grant. Most employers who have training programmes design their schemes to accommodate the requirements of the Industrial Training Act.

2. Training Establishments

An exhaustive list of training establishments and courses offered in each one of them cannot be given here. Complete lists of such establishments are available from the Ministry of Education, and the Director of Industrial Training.

There are several types of establishments which can offer part or full technician courses. Not all of them are capable of providing the outlined courses, because of technical staff. Therefore the number of institutions available does not reflect the training potential of the country.

2.1 Polytechnics

The best establishments in the country are two national polytechnics: The Kenya Polytechnic in Nairobi, and the Mombasa Polytechnic in Mombasa. The polytechnic in Nairobi is more versatile than that in Mombasa; but both are not adequately equipped to offer all the necessary courses. For instance, no polytechnic offers courses in chemical engineering, foundry practical courses, and sometimes, some of the courses in the prospectus may be omitted due to the absence of suitably qualified staff in the material year. Therefore, it should not be expected that so long as a course is outlined in the prospectus, it is taught every year.

Some of the courses that may be offered in the two polytechnics are: agricultural mechanics and technicians courses, air conditioning, ventilation, and heating technicians courses, construction, plant technician’s course, marine engineering course (part A and B) (offered if there is adequate demand and staff), mechanical engineering technician parts I, II and III, refrigeration technician’s course, electrical engineering technician parts I, II and III, electrical installation technician parts I, II and III and other related courses.

2.2 Self-help institution

Recently (in the late 1970’s), a number of institutes of technology have been established from funds collected by members of various provinces, to cater partially for the very high demand of technicians. Their scope is very limited, and although they are large in number, it will be some time before enough equipment is installed in each one of them, with enough qualified technical teachers. At the moment, very few offer in excess of 3 to 5 courses. Some courses are business studies and have no industrial technical content. The following are some of the institutes of technology already in operation:

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<td>Kimbul Institute of Science and Technology</td>
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<td>Nutrition</td>
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</table>
Institutions

Western College of Arts and Applied Sciences
Sangalo Institute of Science and Technology
Remogi Institute of Advanced Technology

Courses offered

Basic Engineering Studies
Agricultural Eng.
Agricultural Education
Basic Engineering Studies

2.3 National industrial and vocational training centres

These are parastatal establishments in Nairobi, Kisumu and Mombasa, offering very good opportunities for craftsmanship training. They can be attended by people from industry, or students undergoing technician training at other institutions. Their capacity is not enough to cater for the country's demand for places in the centres. Trade tests are held at these centres for candidates wishing to obtain Government trade test certificates at grades III, II and I, grade I being the highest qualification of the three.

2.4 Technical schools

There are about thirteen technical schools which offer a four-year course, being similar with secondary school education. The students sit an ordinary level certificate examination of the East African Examination Council at the end of the four years. Successful candidates from these establishments have a secondary school qualification, with a technical bias, and are suitable for recruitment by industries or organizations requiring technical personnel. They are however taken through technical training and other types of training, necessary for improving their competence for the duties in which they are engaged.

2.5 The Kenya Technical Teachers College

The KTTC is a recently established complex in Nairobi, providing training for technical teachers for secondary schools and other technical institutions. It offers courses in mechanical engineering, building and masonry, industrial arts and electrical engineering, in addition to other commercial courses. Students at this college are a useful manpower, as they do their teaching practice in the institutions mentioned earlier.

2.6 In-plant training establishments

There are a large number of organizations who have set up their in-plant training establishments, which to a large extent would have a bias to their types of occupations, but with a bearing on general engineering principles and practice. Students who undergo training in these establishments cover to some extent, the course content of the training institutions mentioned above. In a few cases, firms organize special block courses for various trainees from outside their organization, to attend, for example, the East African Oxygen Welding School.

Some of the well established in-plant training centres are available at the following:

Kenya Breweries Limited
Metal Box Company of Kenya Limited
B.A.T. Kenya Limited
Kenya Railways Corporation
Kenya Airways Corporation
Chemilil Sugar Company Limited
Directorate of Civil Aviation Limited
East African Power and Lighting Limited
Kenya Postal and Telecommunications Corporation
Ministry of Works.

This is a very short list giving examples of available training centres.

2.7 Agricultural training establishments

Apart from the establishments directly linked with manufacture and repair, there are other training centres, mainly of agricultural bias, but since agriculture is a major industry in this country, they merit just as much as the other institutions. They are mainly under the Ministry of Agriculture. Examples of these are: Bukura, Abiti, Nyahururu, Mombasa, Embu, Maseno and the Government Training Centre in Mombasa. Students from other training establishments, who wish to acquire an agricultural bias, can arrange to attend specified courses at these establishments.

2.8 Management training

Establishments offering management courses are few in the whole country. The polytechnics are the best training centres at technicians' level. However, some useful courses can be offered at the Government Training Institute in Maseno, and the Kenya Institute of Administration. The Kenya Institute of Management offers opportunities, but they are likely to be too advanced for technicians.

2.9 Village polytechnics

Village polytechnics are meant for craft studies only, and are suitable for students wishing to take government trade tests. They cannot be used for technician training. However, practical training in craftsmanship can be offered to trainee technicians, who may not secure places in the available institutions. Examples of these are: the appropriate technology centre at Karen, and the Christian Industrial Training Centre, both in Nairobi.

3. COURSE CONTENT

The course content is fairly common to all technicians, on aspects of general applications, but depending on the ultimate duties of the trainees, there are portions of the courses which are geared to the relevant technologies. Hence, it is only necessary to outline here, the generally covered portions of the courses.

The students cover various courses to varying depths, depending on their stage of training, i.e. part I, II or III. The general topics which recur at each stage are:

(a) Engineering Services - concerned with general appliances the trainee might meet in practice.
(b) Mathematics
(c) Engineering Sciences - concerned with the area of specialization.
(d) Physics and Chemistry - covering aspects which are related to the courses taken.
(e) Technical Drawing - Relevant to the course taken.
(f) Workshop Technology - Relevant to the course taken.
(g) Workshop practice - in the area of study.
(h) Engineering Materials and uses - as applied in the area of specialization.
(i) Industrial processes and production techniques.
(j) Plant maintenance.
(k) Industrial Organizations - at an elementary level.
(m) General Studies.

In addition to these courses which have a large degree of similarity, students take other courses which concentrate on their areas of discipline. Detailed syllabi are available from the East African Examinations Council which examines all the trainees at the end of their technicians' courses.

Every syllabus is outlined, in accordance with the requirements of the duties expected to be assigned to the trainees. Periodical revisions are carried out, to keep abreast with developments in industry.

4. PART-TIME TRAINING

The requirements of the Industrial Training Act concerning part-time training are as follows:

**Entry Qualifications:**
These have been stated in 1.4(2)

**Training Scheme:**
For apprenticeship it is required as follows:

**1st Year**
- 6 months in-plant training
- 3 months craft orientation
- 3 months in-plant training

**2nd Year**
- 13 weeks approved institutional course
- 13 weeks in-plant training
- 13 weeks approved institutional course
- 13 weeks in-plant training.

**Technician Part I Examination.**

**3rd Year**
- As in second year.

**Technician Part II Examination.**

**4th Year**
- Supervisory training
  - (a) With the firm and
  - (b) Institutional Course
- 6 weeks Management Course

**Technician Part III Examination.**

Trainees who qualify at Part III are awarded the full technicians certificate.
4.1 Institutional arrangements

The training institutions offering training courses arrange to have durations which comply with the Industrial Training Act. Therefore, firms training their employees also arrange programmes complying with the Act.

The institutions break down their course work and practical assignments into portions which are adequate for every term of 13 weeks. These are available from the respective departments of the institutions offering the respective courses.

4.2 In-plant training

Industries with in-plant training programmes also try to fit their course content in the four years, within the time allowed for in-plant training by the Industrial Training Act.

The courses offered by various firms are bound to be different because of non-uniformity in their production activities. Examples can be given only to illustrate the intensity of the training programmes in industry.

4.2.1 Programme in a food processing industry

The following is an example of a programme used in a food processing industry:

3 weeks - safety aspects, orientation on general processes, quality control, laboratory tests and the general operation of machinery.

The trainee is seconded to a sectional head.

1 week - methods of stores control and purchasing for both local and overseas orders. The trainee is seconded to a senior stores clerk.

6 weeks - workshop fabrications and repairs. Further training on safety aspects. The trainee is seconded to a senior technician or engineer from here onwards.

10 weeks - general introduction to the operation of plant machinery including involvement in major repair and maintenance. Further training on safety aspects.

48 weeks - detailed explanations of individual operation of machinery and their maintenance. Further training on safety aspects.

6 weeks - instrumentation, application of automatic control devices, instruction on basic fault identification and minor adjustments. The trainee is seconded to the instrumentation engineer.

8 weeks - project department at the headquarters. Familiarization with all aspects of current project work. Methods of estimating and costing project work. The trainee is seconded to a specific project to be involved in its progress.

The programme is completed in 82 weeks.

The above programme is for an engineering technician. Technicians who deal with the product in the same industry, undergo the programme outlined below.
4.2.1.1 **Programme for production assistants**

4 weeks - General introduction to the industry and its activities. 
Safety aspects.

92 weeks - Training in various processing stages with durations varying 
between 8 to 10 weeks in each section.

8 weeks - Quality control.

20 weeks - Packaging machinery familiarization.

1 week - Engineering services for the industry - familiarization.

1 week - Stores control and purchasing procedures.

1 week - Transportation and distribution.

After 127 weeks, the trainee has undergone a controlled practical training 
and experience of the factory.

In the course of the above training he undergoes a day-release training 
programme at an approved institution, mainly the Kenya Polytechnic, for a period 
covering 6 terms. He studies for a "certificate in general food technology" 
examination.

The trainee then takes a full time "off-the-job" course of 3 weeks, where 
he takes management studies concentrating on:

Organization structures 
Supervisory management 
Work organization and planning 
Production responsibilities and duties 
Costing and estimating 
Budgetary control 
Industrial relations and personnel functions 
Communication.

Finally the trainee is given guidance and preparation for a specific appoint-
ment. The final stage takes about 8 weeks. Hence the total training duration 
takes a minimum of 138 weeks.

4.2.2 **Programme from a hardware manufacturer**

This programme is taken from a manufacturer having an in-plant training centre, 
catering for technician and craft apprenticeships.

Technician apprentices can advance to eventual appointment as departmen-
tal foremen or superintendents. Craft apprentices can develop into the companys' 
skilled personnel in the tool room and maintenance areas. They can be promoted 
to chargehands and foremen.

The technician grade attend sandwich courses, but on a fairly different scheme, 
from what is recommended by the industrial training act in (4.0). They spend the 
first two years on practical training at the employers apprentice training centre. 
The third year is spent in the toolroom and maintenance departments, and the fourth 
and fifth years on production lines. Hence the programme is accomplished in 5 years.
Some of the trainees with outstanding performance and merit are trained further overseas, for specialized duties. This is normally an extension of the training beyond the minimum period of 4 years, required by the Industrial Training Act. Somewhere within the five years the part-time training at an approved institution is included, thus meeting the requirements of the Industrial Training Act.

This programme demonstrates that possible extensions or alterations in the approach to training may be suitable for certain organizations where specialized work is handled, which requires more technology than is available in the training institutions locally available.

4.2.3 Programme from an assembly plant

This is a programme similar to the one from a manufacturers' establishment given above. In the first year of in-plant training, the functions of the various components of the machine which is assembled are explained to the trainees, and they are given basic training on the assembly. In the 2nd, 3rd and 4th years, the trainees learn in detail, the assembly fault finding, repair and maintenance aspects.

It can generally be seen that most firms run fairly similar training programmes, and the prospects for the trainees are adequate, especially if they are employed in expanding organizations, which is the case in a majority of firms. The programmes detailed above are a reasonable replica of the training programmes likely to be in existence in most establishments.

5. PROBLEMS AND DIFFICULTIES

The problems and difficulties facing the training of technicians arise from several sources namely; the training institutions, the employers, the students and the environment surrounding the training system. The following are some of the major problems.

5.1 Employers' training policy

The employer who sends trainees to training institutions might be doing so because it is his policy to train local manpower for various jobs, or because he has to comply with the requirements of the Industrial Training Act. If it is the former, then the employer sets up a systematic well-operated training scheme. If it is the latter, the function of training becomes an imposed requirement, thus, it is seen as an inconvenient external and undesirable factor. But, since it has to be accommodated in the organization, the employer puts up with it, but does not organize a useful in-plant training scheme.

The trainee will in such a system attend part-time training, usually at a polytechnic, but when he is supposed to be undergoing in-plant training, he is made to work to compensate for the time he has spent away from the enterprise, and the only training he gets is appreciative. It is upon him to find out the technology involved in the product or work he is dealing with. Generally, the trainee therefore suffers extensive lack of practical competence, and might miss altogether, any reasonable practical training during the prescribed four-year training period.

Some prospective trainees land into the premises of smart employers, who have taken their time to study the loopholes in the Industrial Training Act and Employment Regulations outlined by the Labour Office. The employees in this category are placed on jobs, and paid a regular salary at the start of their employment. They are then taken to training institutions, and during the part-time training period, they are not paid their salary at all, nor any form of allowance. The trainee finds himself in a state of dilemma, because securing a place at a polytechnic is a great achievement for him. If he presses for his wages he might lose this chance altogether.
He might want to take legal action, but when one is employed by a smart employer, he has no documentary evidence of a contract of training, and the trainee would lose his case in court, because the employer will get away by alleging that their agreement was mutual. There is a likelihood of the employer denying categorically any previous connection with the complainant.

From a situation like this, if the aim of training is to produce competent and qualified manpower, then the objective is not achieved. It ends up a mere increment of academic information, on the part of the trainee. For the employer, it is a source of cheap labour, where there is an excuse to pay a hard working individual very sparingly, while at the same time making profit from no investment, during the possible reimbursement, from the Industrial Training Levy.

5.2 Limitations of in-plant training:

A major limitation in in-plant training is running a training scheme in a profit-making system. The two are incompatible. However most people do not run a separate training centre. The trainees are taught various things on the production lines. A popular statement in such systems is "ask questions about anything you want to know". Of course the trainee asks questions, but sometimes the answers put him off, especially when he tries to ask something academic and tries to link it with practice.

Secondly, in most cases, the trainee is assigned to a qualified technician during in-plant training as his tutor. The tutor is naturally not enthusiastic about imparting detailed knowledge onto the trainee, as he fears that the latter might be a dangerous competitor for him when qualified. In the light of this shortcoming it should not be assumed that if an organization gives an impressive training scheme on paper, the trainee is given what is outlined to perfection. A general statement can therefore be made that at the moment, there are many organizations with sound training programmes on paper, but they are not as sound in practice.

5.2.1 Trainees assignment

It is a common belief in industry that "practice makes perfect". While the saying is true in and outside industry, the trainee is misused under the umbrella of this philosophy. The trainee is supposed to be given duties which challenge his know-how, make him think and try to produce a solution satisfactory to him and the employer, so that he learns more about his occupation.

In most cases, the trainee is used as a helper during his in-plant training. He might be told to help in dismantling a machine for repair, but to keep off during its assembly. He is given jobs like cleaning components, collecting required spares from the stores, or acting as a spanner boy. The reason given for such assignments is that the trainee might damage expensive items. This is true, but he should be continuously told what he can damage, what should be done, and what precautions to take at each stage. He cannot be informed of these important aspects, if he is on trivial jobs. Even if he does not handle the delicate components he should be taught about them while they are being worked on. This approach does not exist in most industries at the moment.

5.2.2 Monitoring the training systems

In a system where the training schemes are to be improved, there must be substantial monitoring, in the institutions, for the employers and the trainees. The problems of training cannot be identified, if the recipient who is the trainee, is not interviewed regularly. There is no regular interview held at the moment for trainees to express their feelings about the time allowed for training, the problems they encounter and any relevant information.
Employers and institution boards meet regularly, but they talk about problems of training without exposing the major problems at the grass roots. It therefore does not benefit the institutions, the employers or the trainees, if solutions to problems are sought without establishing the main difficulties. The whole function on a national training policy, cannot therefore be improved to a stage where the output is a really valuable asset, in terms of technical manpower. Monitoring training schemes and problems should be taken seriously if the systems are to improve.

5.3 Non-uniformity

There are problems which arise from the background of the students as well as the teaching institutions which develop non-uniformity problems. Students come from secondary schools with a background of physics, chemistry, mathematics; or from technical schools with a background of basic engineering knowledge in mechanical, electrical, automotive, agricultural and civil disciplines, as well as some knowledge of carpentry, building and surveying. At the intake stage there is a wide variety of backgrounds and the teaching of technical subjects is complex. It requires that the teacher ignores previously covered technical studies so as to give every trainee a fair chance. However, the trainees with no technical background are overtaxed, as those with previous knowledge of the subject catch up much faster.

Secondly, institutions are aided from overseas by various countries. The aids are in terms of teaching staff, equipment and possibly the design and construction of buildings. Since the sources of aid are different there is a variation in the approach to teaching as well as laboratory equipment. While this sounds a minor point, it presents problems to students because they have to learn the operation of different pieces of equipment for the same exercises. Sometimes they would rush for the piece of equipment which looks more attractive. There is an additional problem, introduced by lecturers, who discredit some pieces of equipment, depending on their countries of origin, which makes students lose faith in some of the equipment.

5.4 Employers' needs and present syllabi

Some employers have complained about the irrelevance of the present syllabi to their interests. This either means that the courses do not cover what they want, or they contain extra information which they do not wish to use at the moment. It is however difficult to draft a syllabus covering all interest. In a case where more subjects should be included, it is better to draft additional syllabi, covering these areas. At the moment there is no part-time programme for chemical engineering technicians, for example. The employers of technicians faced with such occupations, find it a waste of time to training their employees in mechanical engineering. The available training institutions require further expansion to cater for such requests.

In the case where an employer feels that the course content is too wide, the extra information is for his employees future benefit and although the employer sees it as a problem, it is an advantage.

However, in general there is need to match as closely as possible, employers' needs to institutions syllabi. This can be effected by monitoring more effectively the employers' needs, institutional arrangements and syllabi as discussed in (5.2.2).
It is not only the employers who complain about the syllabi. The students also find it a waste of time to learn things which they do not connect with immediate application. For example, most of them are unconcerned about industrial organization courses. Although this subject enlightens them about the interacting administrative network of their organizations, they do not foresee chances of being actively involved in the administration, in their lifetime while working in industry. Therefore, they take the subject because they are required to take it or because it is compulsory to take it. It is important for the employers to show that there is need for technicians to be well versed with management, and to an extent, show where the knowledge of the subject is vital. If it does not have a specific application then the syllabus requires revision, so as to suit the duties of the technicians. This example might at present be valid for many courses; thus, leading to the general need of examining in detail, the direct link between part-time courses and technicians' duties and surveying the possibilities of improving the link which presently appears to be very meagre.

5.5 Demand for training opportunities

The demand for technician training is enormous, being a result of several factors. Firstly there is a great shortage of training facilities. The competition for places in training institutions is therefore very tight among employers. This makes it absolutely out of question for people in small businesses and self-sponsored trainees, to be admitted into these institutions.

Secondly, there is a great imbalance between the number of youngsters coming out of school, and the absorption rate of the same into industrial or organizational establishments. There is at the moment a lot of emphasis on technical training for school leavers and yet they have nowhere to train themselves.

Apart from the urgent need to expand the present institutions, there is even more urgent need to establish more institutions. There are major constraints when expansion is considered. Finance, lack of technical teachers and laboratory maintenance staff are some of the most common ones.

The problem of offering to the whole country adequate training facilities is almost impossible to overcome. There is a rapid increase of school leavers, rapid economic or industrial development, an increasing demand for technicians especially in refrigeration and air conditioning, instrumentation and control, foundry work, which have not been offered before and other newly installed industrial disciplines all amplify the difficulties in arresting the situation which is already out of hand. A statistical study of the number of people constituting the group requiring training, the group under training and the available institutions could be of great assistance in evaluating the actual present state of affairs and a reasonably accurate projection of the situation in the next 2, 5 and 10 years. In this way a development plan of technician training could be drawn as a proposal solution.

5.6 Entry requirements

The entry requirements of established institutions are: in addition to those spelt out in the Training Act, a trainee registering for part-time training must be sponsored by an employer. This ensures that the trainee has in-plant training. However, only employed people can join these institutions. People who have no industry or workshop and wish to sponsor themselves are not catered for and they may not get training opportunities.

On the other hand, if the institutions allow the latter group to register for part-time training, they will not get practical training unless a scheme is introduced for seconding them to industries for their practical training. Therefore, it is debatable as to whether the present system is suitable or not.
5.7 Training periods

There are complaints about the training periods. Some people would like longer practical training periods and shorter part-time training periods. It is generally felt within the training institutions that longer practical training periods will make the trainees lose track of their already covered work in part-time schemes. On the other hand the present system is not suitable for many students, because the absorption rate of most of them is below the work load in the present syllabi. It appears that this aspect should be reviewed. It could probably be better for trainees to work in industry, for much longer periods, before they start their part-time training.

5.8 Staff training

There is only one institution for staff training (the KTTC), apart from the University. Both the KTTC and the University cannot cope with the demand for technical teachers. Their output is well below the suitable capacity. Overseas training is available to a very limited scale because of the expenses involved, scarcity of scholarships and staff able to replace the staff on training. Proceeding on study leave overseas. Further establishment of local technical training institutions and a rigorous technical teachers' training policy are required.

5.9 Remuneration of technical teachers

Technical teachers are poorly remunerated and opportunities in industry are much more lucrative and attractive. There is therefore very limited likelihood of retaining adequately qualified personnel in teaching institutions. One of the institutions offers Kes 1700/- p.m. (US $240) while in industry the basic salary would be double and there would be generous fringe benefits in addition. Remuneration will remain a very effective obstacle to retaining technical teachers, unless their emoluments are greatly improved. This might not be possible in cash, but attractive terms of service could be an effective bargaining tool.

5.10 College fees

College fees is a big obstacle for those requiring technical training through personal sponsorships. Some newly established institutes of technology ask for Kes 4000/- per year as opposed to Kes 700 per term at the government polytechnics. It is furthermore disappointing when the students learn that the training costing them such large sums of money are inferior to the standard in cheaper institutions (Kes 4000/- is US $570). Prospective candidates for this training are therefore better off without it when considering the economics of the investment.

5.11 Industrial attachments

Although the present training scheme ensures industrial attachment, it should be appreciated that one industry is likely to be unilateral, hence, very little variety of engineering applications is available to the trainees. At the end of his industrial training he quotes industrial training and experience of several years, which is in fact grossly limited in scope.

It means that the national training scheme is not exploiting the presence of industry in its total variety. There should be a development of a body like the "Kenya Association of Industries" to introduce and maintain a circulation of trainees from industry to industry to appreciate the variety of engineering technology and applications. At the moment it is quite difficult even to secure an industrial visit for a class, because although the visitors to the industry have something to appreciate the host is inconvenienced. A more dynamic system of industrial orientation and experience promotion is required.
5.12 Accommodation

Accommodation affects both trainees and teaching staff. Most trainees are not accommodated at the institutions or by the institutions away from the training complex. Trainees from areas remote from the institutions cannot commute and they would be best accommodated on site. Hostels available are too few and small to accommodate all the trainees adequately.

5.13 Standards of training

The qualified trainees may not be competent enough to take jobs meant for qualified staff. For instance, Technical Drawing and Design are subjects which have been offered for many years and yet the qualified technicians cannot produce drawings to standard. Hence, there are many vacant posts for draftsmen. This is a direct result of poorly trained staff and it is likely to persist for a long time until improvements can be made in staff competence.

5.14 Definition of a technician

There are mistakes in defining technicians and therefore assuming that technician training includes high diploma levels, some clarification ought to be made.

6. REMEDIES TO EXISTING PROBLEMS

These problems outlined above should be analysed in detail so as to provide some remedies. The general points of importance are as follows:

(i) Organization managers should be guided on the necessity of training, so as to appreciate the need for a training policy and sound training programmes. The benefits of training to the organizations and the trainees should be clarified before an encouragement campaign to organise training programmes is initiated.

(ii) It would be advantageous if trainees had specific in-plant aptitude tests frequently, under examination conditions so as to spell out training objectives during practical sessions in industry.

(iii) Training should be monitored by independent interviewers from training establishments. Alternatively students can be given questionnaires on training schemes and their experiences during training. This might help all the people in the training commitments to improve on the programmes.

(iv) Finally, a statistical study should be carried out on various problems given above, as a beginning of the efforts of improving on training systems.

7. CONCLUSION

From this review it can be seen that a good effort has been made to establish a standard training scheme for all establishments, industrial and non-manufacturing. However, plenty of problems have not been given attention and they would multiply considerably, if steps are not taken to reduce or solve them.