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RESEARCH AND DEVELOPMENT
Consulting Engineers

Brussels, March 1969

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards even though the best possible copy was used for preparing the master fiche.

REPAIR AND MAINTENANCE OF INDUSTRIAL EQUIPMENT

SURVEY CONDUCTED IN THE

REPUBLIC OF GUINEA

IN JANUARY 1969

FOR

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

BY

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MEMBERS OF RESEARCH AND DEVELOPMENT

BRUSSELS 1 - BELGIUM

P. 32. only company with ample spare parts
P. 33. Somora car assembly company

March 1969

I. PURPOSE AND CONCLUSIONS

A. PURPOSE

The purpose of this report is to give an account of the survey on industrial equipment maintenance and repair means and methods conducted in the Republic of Guinea and to draw therefrom the necessary inferences in the form of possible recommendations for their improvement.

B. RESULTS OF SURVEY

From the survey it follows that :

- 1°) Most of the industrial equipment in the Republic of Guinea belongs to the State or to mixed companies in which the State generally has a majority holding.
- 2°) The maintenance of such equipment is quite unsatisfactory and, in nearly all industries, has a very detrimental effect on production.
- 3°) Urgent action is essential to avoid destroying all the investment efforts made in recent years for the benefit of the country.
- 4°) The main factors having an adverse influence on the standard of equipment maintenance and repair, are, in their order of priority :
 - a) the shortage of spares
 - b) the lack of qualified personnel
 - c) the want of equipment.

C. CONCLUSION AND RECOMMENDATIONS

To remedy this situation, we recommend :

as top priority

- 1) the sending to Guinea of a team of experts charged with the task of assisting the local authorities in the formation of a Maintenance, Repair and Spare Part Advisory Department

- 2) the sending to Guinea of a team of experts and consultants charged with the task of assisting the Railway Management in the maintenance and repair of rolling stock and the Urban Transport Management in the maintenance of buses.
- 3) the sending to Guinea of an expert charged with the task of assisting the local authorities in the formation of a hospital equipment maintenance and repair service.

as second priority

- 4) the grant of refresher course scholarships in the field of maintenance and repair of the various equipment
- 5) the provision of raw materials for the manufacture of spares, tooling and equipment for the erecting of a spare parts manufacturing shop.

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II. INTRODUCTION

A. SUBJECT

The UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION (UNIDO) has resolved to embark on a long-term campaign aiming at the improvement of the Maintenance and Repair Services of the industrial equipment now existing in developing countries.

With this object, UNIDO has selected a number of typical regions, where the fullest possible investigation has been made of the conditions obtaining in this respect.

The purpose of this report is to give an account of the local survey carried out in the REPUBLIC OF GUINEA and to draw therefrom the necessary inferences.

B. AIMS OF SURVEY

The aims of the survey are :

1. To enable UNIDO the selecting, among regions visited, of those where it is recommended in priority to initiate a campaign for the improvement of industrial equipment Maintenance and Repair Services.
2. To devise a technical aid short- and long-term scheme for the benefit of the selected regions.
3. To bring to light vital needs calling for urgent assistance.
4. To work out a long-term assistance scheme for developing countries covering maintenance and repair facilities.

C. LINES OF REPORT

We first attempted to determine the relative importance of existing industries in Guinea, as well as the part played by them in the National Economy and for exports.

Working from this information we tried to examine the position as to industrial equipment Maintenance and Repair.

For surveying purposes we selected concerns among the various existing industrial sectors and which, according to the local authorities, were encountering difficulties with respect to equipment maintenance and repair.

We did not go into the matter of mining equipment maintenance, as we were informed that this industry was able to deal itself with its maintenance problems.

The analysis and study of the information thus collected provided us with a general picture of the Maintenance and Repair Service set-up and also of the position with spare parts in the REPUBLIC OF GUINEA (*).

Finally, we arrived at the necessary conclusions and made the recommendations we deemed fit to enable UNIDO to pursue the tasks they had assigned themselves.

(*) See under Appendices 1-16 the main information obtained when visiting the respective concerns.

III. PRELIMINARY SECTION

A. RELATIVE IMPORTANCE OF THE VARIOUS INDUSTRIES IN THE REPUBLIC OF GUINEA

There are no official statistics available concerning industrial activity in Guinea.

This being so, we worked on the basis of details contained in a report published by the International Bank for Reconstruction and Development (*).

According to this information the 1964/65 gross national product showed the following distribution :

	%
1. Agriculture, Forestry	53,8
2. Mining	8,9
3. Manufactories	2,6
4. Building	13,3
5. Public Utilities	1,0
6. Transport	3,0
7. Trade	3,0
8. Banking	1,8
9. Public Administration	12,6
Total	100,0

A few new industries have since then been established in the country : Usine Textile de SANOYA, Usines Militaires, Complexe de FOULAYAH (soft drinks).

The report does not state whether the production of the few new industries established in the country since 1964/65 is likely to affect the above distribution.

Our feeling is that there has been no significant change since that period in the relative figures of the report , in view of the major operating difficulties encountered by industries and considering that most of these are only working to a small percentage of their production capacity.

(*) Economic Trends and Prospects in the Republic of Guinea. September 1, 1967.

For want of available statistical material we were not able to make an accurate assessment of the number of existing industries in Guinea. The above ISRD report mentions 41 manufactories.

According to the information we were able to obtain on the spot, this figure is very near the mark. Out of the total, 23 turn out consumer goods such as foodstuffs, clothes, cigarettes, matches; 10 produce investment goods, e.g. building materials, lumber, bricks and tiles. The remaining units manufacture various intermediate goods, such as leather, quinine, perfume, oil and paints.

B. GEOGRAPHICAL LOCATION OF INDUSTRIES IN THE REPUBLIC OF GUINEA

Thirty-four of the forty-one specified industries in CONAKRY or in the vicinity. The seven others are spread over a small number of other urban centres, such as Kankan, Mamou, Foulayah, Sereidou, Labe and N'Zerekore.

C. INDUSTRIAL SECTORS SURVEYED

a) Public Transports

1. Guinean Railways
2. Civil Engineering Department
3. T.U.C. (Société de Transport Urbain de Conakry).

b) Mines

We have already explained (*) why the mining industry had been left out of our survey. However, we did do 1 on :

4. Atelier d'Entretien et de Réparation des véhicules de l'Administration des Mines (Mining Department Vehicles Maintenance and Repair Shop).

c) Manufacturing Industries

c₁) Consumer Goods Industries

5. Fruitaguinée
6. Complexe Textile de SANOYA
7. & 8. Usines Militaires (shoes, clothes)
10. Entreprise Nationale de Tabac et d'Allumettes
11. Usine de meubles de SOHFOHIA (furniture)

(*) Chapter II.C.

c₂) Intermediate Goods Industries

9. Usines Militaires (Leather)

12. Entrepôts Frigorifiques du Port (Harbour Cold Stores)

c₃) Investment Goods Industries

13. Société de Montag^e de véhicules automobiles SOMOVA
(car assembly)

14. Briqueteries de COBAYA.

d) Agricultures (*)

15. AGRIMA (Société Nationale d'Importation de Matériel agricole)

e) Hospitals (*)

16. Hôpital de DONKA (Conakry).

D. RESULTS OF SURVEY

1) Public Transport Sectors

Generally speaking, in the Public Transport sectors the main factors having an adverse effect on the standard of equipment maintenance and repair are : the shortage of spare parts and of adequate facilities for their local production, the lack of experience of personnel both for ensuring a maintenance and repair service and for working the equipment, and finally the condition of maintenance equipment (machine tools and tooling).

2) Mining Sector

The position with the restricted field surveyed in this sector, namely the Mining Department Vehicles Maintenance and Repair Shop, is exactly the same as with the Public Transport sectors.

3) Manufacturing Industries Sector

The main factors having a detrimental influence on the standard of equipment maintenance and repair are : the shortage of spare parts and of suitable facilities for their local production, and the lack of experience of personnel.

(*) Although these are not, so to speak, industrial sectors, they have been included in the survey at the request of ONUDI.

4) Agricultural Sector

This sector does not appear at present to be particularly affected by a lack of equipment maintenance.

5) Hospital Sector

Hospitals have no sufficient facilities for the adequate maintenance of their equipment.

E. CONCLUSIONS AND RECOMMENDATIONS

To remedy this situation, we recommend :

1. The setting up of a Maintenance, Repair and Spare Part Advisory Department

This Department should be formed by the Guinean Authorities with the help of a team of 5 experts.

The first task of this Advisory Department should be to arrange for a planned spare part provisionment of industries. It would further undertake the training of and the providing of advisory service to the people responsible for equipment maintenance and repair and, finally, it would be entrusted with the setting up of a central spare parts manufacturing shop.

2. The sending to Guinea of two groups of experts and consultants charged with the task of assisting the Railway Management and the Urban Transport (T.U.C.) Management respectively in the Maintenance and Repair of transport material.

3. The sending to Guinea of an expert commissioned to assist the local authorities in the setting up of a hospital equipment maintenance and repair service.

4. The grant of 6 refresher course scholarships in the field of maintenance and repair of equipment in industries similar to those existing in Guinea.

5. The provision of raw materials for the manufacture of spares, as well as the provision for tooling and equipment for the erection of a central spare parts manufacturing shop.

IV. REPUBLIC OF GUINEA INDUSTRIAL EQUIPMENT

MAINTENANCE AND REPAIR TECHNICAL SURVEY

A. PUBLIC TRANSPORT SECTORS

1) Rail Transport

- a) Société des Chemins de Fer Guinéens is the only company operating a public rail transport (*). It connects CONAKRY with KANKAN.

It has its own maintenance and repair shops, the various sections of which are grouped together in CONAKRY.

Each section has a responsible person in charge, but does not seem to have a definite working programme.

- b) These shops look after the maintenance and repair of all tractive stock and wagons.

Their equipment covers the full range. But it is short of small implements and of cutting tools for machine tools. As a result, the work cannot be done in a satisfactory way. So, for instance, Diesel motor crankshafts have to be sent to Europe for grinding, for want of a wheel for the grinding machine.

The foundry has no suitable sand or raw materials. Consequently, the parts produced (at present practically restricted to brake shoes) are of very poor quality.

All these plants are owned by the Guinean State.

- c) Spare part provisionment is a major problem with respect to the maintenance of the electro-mechanical part of locomotives.

This deficiency has a considerable and most unfavourable bearing on the maintenance of railway material.

The main restriction on the import of spares lies in the lack of foreign currency the country has at its command to pay for these supplies.

(*) There is a private company only operating ore transport from the FRIA Mines to CONAKRY. This company is directly under the control of the FRIA Mining Complex.

- d) Provided it had the requisite equipment, cutting tools and raw materials, the mechanical engineering shop could turn out a small number of spare parts. However, this production would be confined to a minor quantity of lathe-turned and milled parts.

It should be observed that special parts for internal combustion engines and highly mechanised components cannot locally be manufactured, owing either to their kind or to the material they are made of, or to the accurate workmanship required, or to the heat treatment necessary for their processing.

We were not able to get a figure of the quantity of spare parts at present locally produced. We estimate the production to be on a very minor scale, say hardly over 1 or 2%.

- e) There is no properly organised spare part stores.

2) Road Transport

General

- a) We shall confine our survey to the position with the Maintenance and Repair of road maintenance equipment.

It should first be noted that there is not much road maintenance equipment and that this is mostly worn out or out of use.

- b) The Administration des Ponts et Chaussées (Highways and Civil Engineering Dept.) has got two maintenance shops near Conakry. These are presently being reorganised with foreign assistance.

|| They are properly fitted out, but the equipment needs || ?
reconditioning.

These shops are at present not doing much work due to reorganisation. For this reason, it is not possible to give an opinion on the standard of work.

- c) Spare part provisionment is a major problem and the varying origin of the equipment makes things worse. This factor plays an important part and is most detrimental from the equipment maintenance standpoint. The main restriction on the import of spares lies in the lack of foreign currency the country has at its command to pay for these supplies.
- d) These shops are not equipped for the production of spares, as the machines are of a special kind requiring original parts for maintenance purposes.
- e) There is no organised spare part store.

Public Passenger Transport

- a) We propose to consider here public bus transport.

Passenger public bus transport is operated only by Société des Transports Urbains de Conakry (T.U.C.). This company has its own maintenance and repair shop divided into a number of specialised sections, under a responsible manager assisted by section leaders.

- b) These shops are provided with a service station and organised into different sections, such as : electricity, tyres, coachwork, engine overhaul, injection. All these sections are properly set out round a large yard.

Most of the outfit of these shops is in poor condition and has fallen into disuse, so that the standard of work is quite inferior. Out of a total of 50 buses supplied from 1964 to 1966, 15 only are still on the road.

No special precautionary measures are taken to ensure that lubricating oil is clean and we believe this accounts partly for the premature worn condition of the equipment.

These shops belong to the Guinean State.

c) Practically no spare parts are available and there is no foreign currency available to bring them in with.

d) Considering the condition of the machine tools with which the shops are fitted out, it is now actually almost impossible to turn out decent spare parts.

It should be noted that, in view of the kind of equipment involved, only a small number of spares could locally be produced.

e) There is no spare part store.

B. MINING SECTOR

a) We shall only look into the position with the Administration des Mines et Géologie maintenance and repair shop.

This shop is charged with the maintenance of lorries and sundry vehicles coming under this Department. It is now looking after the maintenance of appliances used by a foreign geological mission.

b) This shop has the requisite standard equipment. Most items of this equipment are discarded due to the breaking or mislaying of some essential components. Its work is therefore on a very reduced scale and it now appears to confine itself to providing assistance to the team of investigators who avail themselves of its services.

This shop is owned by the Guinean State.

c) No spares are available, except a few parts supplied by the foreign mission for the maintenance of its own equipment.

d) The shop is not able to make decent spares. The type of plant (road machines) the shop is called upon to service requires the use of a major proportion of genuine spare parts.

e) There is no spare part store.

C. MANUFACTURING INDUSTRIES SECTOR

- a) We do not propose to deal separately with each branch in this sector, as the respective positions are very much the same. With respect to any differences, Appendices 5 to 14 are relevant.

Most concerns include an equipment maintenance and repair service. But we came across one concern (Complexe Textile de SAMOYA) with no maintenance facilities provided for when the plant was erected. A shop is now in the course of development. Another concern (FRUITAGUINKE) has no maintenance shop.

The maintenance service is nearly always (8 cases out of 10) an independant unit with a responsible management. None out of 10 concerns has developed an actual routine maintenance programme. Nowhere did we find preventive maintenance being carried out.

- b) There is no independant or State-owned central repair workshop. The military shops do have their own central workshop, but this forms an integral part of the three organisations making up these shops and does practically no work for other industries.
- c) The supply of spare parts is a major problem for the proper working of Guinean industry. This factor has a very important and adverse effect on the standard of equipment maintenance and repair.

The main restriction on their importation is referable to the lack of foreign currency at the country's command to pay for the necessary supplies.

- d) The few workshops existing within concerns are capable of producing a small number of spares. But this production is almost confined to lathe-turned parts and a very few milled parts. The country is completely short of raw materials for the manufacture of parts. It has no heat treatment furnaces and, as already mentioned, the only foundry we know of (Railway Workshop) is no longer able to turn out a decent casting for want of raw materials and suitable sand.

- e) Spare part stores, where they exist (6 out of 10), are poorly stocked (7 out of 10) and their organisation is none too good.

D. AGRICULTURAL SECTOR

- a) All the necessary products for agriculture are imported by Société d'Importation de Matériel Agricole, AGRIMA, which is under the control of the Secretary of State for Rural Economy.

Mechanical appliances are being used for the development of some crop farming (wheat, millet and other food produce). Before 1960, there were seventy tractors in the country.

1,268 tractors have since been imported, more than half later than 1967. They are therefore of recent make.

Tractors are of 9 different makes but most of them (500 to 600) come from the same country (Rumania).

- b) Each important town has tractor-driver training centres, with a garage and workshop lorry. These centres serve subcentres.

The forming of drivers and breakdown-service mechanics is in the hands of a technician detailed by the maker over the trial and guarantee period.

- c) Spares are supplied with the machines and are regularly reordered.

There is however a difficulty arising out of the multifarious origin of the equipment.

- d) We were not able ourselves to ascertain the efficiency of the devices employed for agricultural equipment maintenance and repair purposes. The Guinean authorities we met made no mention of any particular trouble in this connection. It should however be observed that the greater part of the equipment is of recent make and it is thus that maintenance problems may not have so far arisen

E. HOSPITAL SECTOR

- a) There is a main hospital in Conakry (Hôpital de DOWKA with beds for 500 patients), as well as 4 hospitals in the interior of the country : Kankan, Labbé, Mammou and Kindia.
- b) Facilities available to hospitals for the maintenance and repair of their equipment are very modest, chiefly when the great variety of such equipment is considered.
- c) There is no central maintenance service.
- d) Hospitals are without any spare parts and very few of these (a few units per cent) lend themselves to local manufacture.
- e) There are no stores, either in or out of the hospitals, keeping a stock of spares.

V. PREVAILING FEATURES AND DIAGNOSIS OF

MAINTENANCE AND REPAIR ACTIVITIES

A. SUITABILITY OF MAINTENANCE AND REPAIR FACILITIES

1) Public Transport Sectors

In this field the maintenance and repair facilities available to the people responsible for this service are unsatisfactory.

Although all concerns surveyed have got maintenance shops, none of these is able to perform its task efficiently.

Their equipment (machine tools and tooling) is no longer serviceable, either because some essential components are not there or because some implements and cutting tools are missing.

One wonders how the Guinean Railways still manage to operate, with only 7 out of 16 locomotives supplied in 1962 still in service in January 1969.

As for buses, 15 only were still on the road at that time out of 50 supplied in 1964 and 1965.

We were not able to ascertain the influence on traffic of the lack of maintenance.

2) Mining Sector

In the restricted field of our survey in this sector, viz. the Mining Department vehicles maintenance and repair shop, its inability to carry out efficiently such maintenance is noticeable. The equipment is no longer in working order and the activity of the shop is now severely curtailed.

3) Manufacturing Industries Sector

It is quite obvious that the maintenance and repair facilities presently available to most concerns are unfit.

Either they are lacking (FRUITAGUINEE) or they are only partial for want of tooling, tools in poor condition, or shortage of spares or of raw materials for the manufacture of such spares.

Many factories are working short of their rated production capacity, as the equipment is out of service for want of maintenance and repair - in some cases since many months - the SANOYA Textile Complex for instance is now working at one quarter of its capacity; and the SONFONIA furniture works is turning out just over one tenth of the units it should be producing. It may be that part of the shortage of production is due to the scarcity of raw material, but we saw in both concerns many items of equipment lying idle for want of spare parts.

Only a few concerns are nearly not affected in their production by inadequate repair and maintenance. Such are : **Entreprise Nationale Tabac et Allumettes ENTA**, and **Usines Militaires** (Tan yard, shoes, ready-made clothes). These are exceptions, the former having had a regular supply of spares, the latter being quite recent and in possession of a contract still in force for the supply of spare parts and technical assistance.

4) Agricultural Sector

It seems that in this matter adequate facilities are available to the Guinean Authorities to provide suitable maintenance of agricultural equipment.

5) Hospital Sector

This sector is nearly without any maintenance and repair facilities for its equipment. We were able to ascertain many items in poor working condition such as the mechanical parts of X-Ray tables, foot switch gear for dentist apparatus, etc. (see Appendix 16).

B. INDUSTRIAL SECTORS OR EQUIPMENT FACING A PARTICULARLY SERIOUS MAINTENANCE AND REPAIR PROBLEM

All the industrial sectors under review have to face, to a varying extent, maintenance and repair problems.

At the time of our visits the most handicapped sectors were :

- rail and road transport
- the textile industry
- the furniture industry
- hospitals.

As for the equipment, explosion motors may be considered as the items suffering most from inadequate maintenance and repair because of the great number of spare parts and skill required for their maintenance and repair.

C. FACTORS AFFECTING THE STANDARD OF EQUIPMENT MAINTENANCE AND REPAIR

The factors having a detrimental influence on the standard of equipment maintenance and repair are, in their order of importance :

- the shortage of spare parts
- the lack of facilities for the manufacture of such general mechanical spares as may conveniently be made locally.

This lack of facilities derives sometimes from the absence of adequate machine tools or tools, sometimes from that of the requisite raw materials, sometimes from that of drawings.

- the qualifications of personnel, mainly that of managerial personnel. Although it may have had the necessary basic education, managerial personnel has not been able to gain the experience or particular technical know-how required for ensuring the maintenance and repair of industrial equipment

- the qualifications of operating staff using the said equipment. Such staff, often deprived of experience on the start up of new plants, has been the cause of many cases of faulty operation with the consequent frequent stoppage and premature wear of machinery.
- the condition of maintenance equipment (machines and tools).

D. IMPACT OF THE LACK OF STANDARDISATION AND OF THE DIVERSITY OF EQUIPMENT ON ITS MAINTENANCE AND REPAIR

It is obvious that the lack of standardisation and the diversity of equipment make for a great increase in the number of spares and face maintenance and repair personnel with a new difficulty (more tools and instruction).

However, such lack of standardisation is not the main factor having an unfortunate effect on the standard of industrial equipment maintenance and repair.

E. AVAILABILITY OF PUBLIC OR PRIVATE CONCERNS DEALING WITH MAINTENANCE AND REPAIR (CENTRAL WORKSHOPS) (*)

There are in Guinea neither public or private concerns attending exclusively to industrial equipment maintenance or repair, nor mechanical engineering shop adequately fitted out to be capable of turning out, suitable general mechanical spares for the various concerns.

F. EXISTENCE OF A NATIONAL POLICY GOVERNING EQUIPMENT MAINTENANCE AND REPAIR

The full significance of the industrial equipment maintenance and repair issue has not been overlooked in Government circles. We heard of a project for the setting up of a central organisation to deal with this problem, but we were

(*) Maintenance and Repair "Central Workshop" refers to any shop working for several customers (sections within one particular concern, separate concerns, etc) and having a separate management.
A "Central Workshop" may form an integral part of a concern, a group of concerns or form an independent unit.

not able to obtain further particulars.

There seems, therefore, to exist at the present time no definite Government policy on industrial equipment maintenance and repair.

VI. PERSONNEL

A. AVAILABILITY OF QUALIFIED EQUIPMENT MAINTENANCE AND REPAIR PERSONNEL

Industrially a new country, Guinea can of course not yet claim to possess personnel with special experience in the field of equipment maintenance and repair.

Operatives, some of whom have been on a vocational training course, either in technical schools or in schools forming an integral part of some concerns, may attain a sufficient measure of proficiency to do the job satisfactorily. This does not alter the fact that this personnel still needs to be closely supervised and guided to better it in a particularly difficult field involving a very wide variety of tasks.

There are very few foremen and hardly any native managerial staff, who are really qualified. Most members of existing managerial staff have taken a degree abroad and have had a theoretical education. But they are lacking in the essential practical industrial experience for playing an effective part in the field of equipment maintenance and repair. Besides, this practical experience is hard to obtain in a country not yet industrially grown up.

In conclusion, we would say that Guinean personnel is much shorter of technical experience than wanting in skill.

B. TRAINING FACILITIES

There are in Guinea technical and vocational training schools, instructing labour in the various techniques that occur in maintenance and repair work.

The I.L.O. is undertaking, within framework of the UNITED NATIONS DEVELOPMENT PROGRAMME, the training of intermediate superintending staff and foremen.

A few concerns also run their own training school (*). Yet, such training is not specially directed to instruction on the maintenance and repair techniques.

To the best of our knowledge, there is no systematic training programme in the particular field dealt with in this report.

-
- (*) - Guinean Railways
 - Complexe Textile de SAGBIA
 - Usines Militaires (Military Factories)

VII. FUTURE POLICY

A. MAINTENANCE AND REPAIR REQUIREMENTS AND DETERMINING OF PRIORITIES

In Guinea, all factors acting upon the standard of equipment maintenance and repair have a detrimental influence thereon. An attempt to determine a priority and to bring accordingly an influence to bear upon a particular factor without at the same time exercising an influence on the others would yield no practical and lasting results.

Nevertheless, to give a rough idea of the priority order of the various factors, we are listing them below in their order of importance :

- | - need of spares and raw materials to produce them
- | - need of personnel training
- | - need of equipment (machine tools and tools).

It is likewise difficult to determine priorities among the various industries, where maintenance and repair problems arise very much in the same way in the different sectors. It is rather the national economic essential requirements, outside the scope of this survey, that will have to guide the choice of priority sectors for the implementation of the assistance programme to be developed.

B. RECOMMENDATIONS REGARDING THE IMPROVEMENT OF EXISTING MAINTENANCE FACILITIES

1. Formation of a Maintenance, Repair and Spare Part Advisory Department.

To permit prompt and the most extensive action to be taken, we recommend an assistance programme consisting in the formation within the Guinean Government department concerned of a MAINTENANCE, REPAIR AND SPARE PART ADVISORY DEPARTMENT.

Its duties to cover :

- the study of spares so as to differentiate between those that can locally be made and the items to be ordered abroad
- the preparation, as the case may be, of the drawings and specifications of spares for local production
- the determining of priorities among parts for local provisionment or obtained abroad
- the preparation of specifications of raw materials for provisionment for the manufacture of spares and the tooling required for this purpose
- the preparation of a list of machine tools and tools permitting an extension of the range of spare parts that can locally be made (e.g. gear-cutting machines, heat treatment furnaces, etc)
- the organising of scrapped old material recovery in order to salvage parts and raw materials for the manufacture of spares
- the study of all possible changes likely to conduce to the improving of operations, the cutting down of maintenance and the standardising of equipment
- the availability of technical literature, catalogues, etc
- the running of training seminaries for :
 - . the organisation of a maintenance service
 - . the development of routine and preventive maintenance programmes
 - . the organisation of spare part provisionment
 - . the setting up of spare part stores
 - . standardisation
- The giving of advice to concerns in the field of equipment maintenance and repair
- the giving of advice to the services concerned when buying new equipment, in the matter of maintenance, spares and standardisation

- the study of the grouping of machine tools available in Guinea into a central shop and the listing of supplementary equipment required for this shop to carry out the production of spare parts. A spare part central store should be set up next to this shop (see D below).

For the purpose of setting up this service, assistance should cover :

a) The services of experts

The provision of the services of 5 experts, namely :

- a mechanical engineer with expert knowledge of maintenance and repair
- a head-draughtsman technician
- a technician with expert knowledge of provisionment, spares and raw materials for same
- a technician with expert knowledge of motor car mechanics, diesel and petrol engines
- a technician with expert knowledge of industrial and motor car electricity.

Guinea should provide the correlative personnel and qualified draughtsmen, to receive training simultaneously with the development of the above activities.

The services of the team of experts would cover a period of 2-3 years, allowing of extension as required.

b) Supply of office appointments and cars

The supply of office appointments, furnishings and all outfit required for the running of the Advisory Department and the supply of cars for the experts' travelling requirements.

Guinea would make available the necessary premises.

c) Supply of technical literature

The supply of technical and bibliographical literature on industrial management, maintenance and repair of industrial equipment, standardisation, spare part production and stock control.

d) Provision of raw materials

The provision of raw materials required for the manufacture of spares and of tools for machine tools.

2. Special Assistance

The Railways and Conakry Urban Transport System (T.U.C.) are special problems. Their solution calls for a scope of assistance too vast for the abovementioned Maintenance Advisory Department to be in a position to cope with, without interfering with its work on the other industries.

With respect to these two sectors we suggest special assistance consisting in the provision of the services of experts and consultants.

a) Railways

- an engineer, technical adviser to the management, for maintenance and repair
- a diesel shop foreman
- an electrician shop foreman (tractive stock)
- a rolling stock shop foreman
- an "Inspection and Depot" (current maintenance) shop foreman
- a technician with expert knowledge of foundry.

Such assistance to cover a period of two years.

Three consultants with expert knowledge of the makes of engines run by the railways (locomotives and rail cars), two of whom on the mechanical side (diesel motors) and one on the electrical side. Their task would mainly consist in the preparation of lists of spares required for the repair of the tractive stock.

The services of the specialists to cover a period of 6 months.

b) T.U.C. Public Transport

- a mechanical engineer with expert knowledge of the maintenance and repair of motor vehicles, adviser to the management

- a technician with expert knowledge of diesel motors
- a technician with expert knowledge of motor car mechanics and electricity.

The services of these specialists to cover a period of 2 years.

C. RECOMMENDATIONS ON THE INTRODUCTION OF NEW MAINTENANCE FACILITIES AND PROGRAMMES WITHIN CONCERNS

1. Assistance to hospitals

As requested by UNIDO, we extended our inquiries to cover the field of hospital equipment maintenance.

As for this sector, the responsible Government departments have no maintenance and repair service, we recommend special assistance in the form of the provision of the services of an expert. His task would be to help the Guinean authorities in forming a hospital equipment maintenance service.

The services of this expert to cover a period of 18 months.

2. Supply of Maintenance Equipment

As already stated, one of the tasks of the Maintenance, Repair and Spare Part Advisory Department, mentioned under B.1) above, would be to help the local authorities with the setting up of a central workshop to turn out some types of general mechanical spare parts which may without difficulty be made locally.

The outfit of this shop would consist of a number of machine tools of which we have heard and which now appear to be standing idle. However, we were not able to obtain a list of this plant or details of its present condition.

It is therefore advisable to provide for the fact that some of the equipment essential for the running of the workshop (universal milling machines and gear cutting machines)

is not in the country or is no longer in good condition, and should be supplied with foreign aid. We recommend the provision of such maintenance equipment according to a list to be drawn up by the team of experts as stated under B.1) above.

Some small tooling should be added, such as drills, milling tools, grinding wheels, various cutting tools, etc.

We further suggest the supply of a stock of raw materials for the manufacture of spare parts.

D. RECOMMENDATIONS REGARDING THE IMPROVEMENT OF PRESENT STORES AND THE SETTING UP OF NEW STORES

The supervision of spare part stores, where they exist, among 80 % of concerns covered by our survey, needs to be improved.

It is for this purpose that, under B.1) above, we suggested the organisation of training seminars, one of their objects being the streamlining of the management of spare part stores.

We further recommend the setting up, within the framework of the spare part engineering shop mentioned under C.2), of a central store for spare parts to carry a stock of all parts common to several industries and all components of current consumption, e.g. normal electric motors, driving belts and pulleys, bolts, nuts, etc.

This shop should further hold a stock of raw materials to be used for the manufacture of spare parts.

E. TRAINING OF PERSONNEL

Refresher Course Scholarships

One of the factors having a detrimental influence on the standard of equipment maintenance and repair is the lack of experience on the part of personnel, mostly at managerial level.

In addition to the action taken by ILO (see Chapter VI.B) and which should be helped forward, we suggest the granting of six scholarships each covering a period of 6 months for the foreign training of the managerial staff of the maintenance services of concerns.

Such personnel to concentrate exclusively on the study of equipment maintenance and repair pertaining to industries similar to those found in Guinea.

The selection of the kinds of industries where training should take place would be made according to the recommendations of the experts entrusted with the organisation of the Maintenance Advisory Department mentioned under B.1) above.

We also propose the grant of three scholarships each covering a period of six months. They would serve for the training of three specialists able to look after the maintenance of such special hospital equipment as an electro-cardiograph, X-ray apparatus, anaesthetising and reviving apparatus, and so on.

F. THE PART INDUSTRIALISED COUNTRIES AND PARENT COMPANIES COULD POSSIBLY PLAY

Industrialised countries and parent companies are now already playing a not inconsiderable part. Indeed, nearly all concerns surveyed (93 %) have enjoyed or are still enjoying the benefit of technical aid contributed by industrialised countries. Such aid, in cases where it has been discontinued (in particular the Guinean Railways and T.U.C.), could usefully be resumed. It should be borne in mind that, in some instances, technical assistance should be more specially directed to maintenance problems (Briqueterie de COBAYA and Usine de meubles de SONFOWIA).

As for the technical assistance spare parts supply, it is noted that only one concern among those surveyed, although it came into production several years ago (1964), seems to get a regular supply of spares (Entreprise Nationale de Tabac et Allumettes).

The military plants have also got a stock of spares, but these only came on stream in 1966.

The SOMOVA car assembly company does not appear to hold a stock of spares, for want of credit. Such parts are ordered as and when required. This entails the standing idle of vehicles, which the local availability of an adequate supply could obviate.

The improvement of technical aid contributed by industrialised countries and parent companies on the abovementioned lines would be conducive to that of industrial equipment maintenance and repair.

G. TIME LENGTH OF ASSISTANCE PROGRAMMES

We have already specified in each case the period which assistance programmes should cover.

We consider the specified time lengths to be minimum estimates and that the abovementioned services of experts should allow of extension, as required.

H. SUGGESTED ASSISTANCE PROGRAMME SCHEDULE AND PRIORITIES

Table I shows the schedule and priorities of the assistance programme suggested in the previous chapter.

The dotted lines indicate the extension, if any, of the services of experts according to a schedule to be worked out at the end of the initial stage of the assistance programme.

APPENDIX O

CONVENTIONAL SIGNS

A. GENERAL

- A0 Name of industry surveyed
- A1 Year of establishment
- A2 Branch of activity
- A3 Production capacity
- A4 Present production
- A5 Economic importance
- A6 Production equipment
- A7 Personnel
- A8 Ownership

B. MAINTENANCE AND REPAIR SERVICE

- B1 Structure
- B2 Programme
- B3 Equipment, Shops, Tools
- B4 Spare Parts, Stores
- B5 Personnel

C. COMMENTS

- C1 Suitability of maintenance and repair facilities
 - C2 Factors having a detrimental effect on the standard of equipment maintenance and repair, according to their importance
 - C3 Impact of lack of standardisation on equipment maintenance and repair
 - C4 Proposed remedies
-

APPENDIX 1

A0 SOCIETE DES CHEMINS DE FER GUINEENS

A1 1915

A2 Passenger and goods rail transport from Conakry to Kankan (670 km).

A3 Does not apply. Not known.

A4 Does not apply.

A5 Carries 1/3 of goods, 2/3 being carried by road in spite of its bad condition. Traffic is lively mostly on the Conakry-Mamou section (App. 17).

A6 22 Diesel-electric ALSTOHN type B-B locomotives, including 16 925 HP main-line engines and 6 300 HP shunting engines.

This rolling stock dates back to 1962.

12 MAN type ZH 420 HP railcars

230 wagons and 26 passenger carriages.

A7 Staff numbering 2,600, inclusive of operating personnel.

A8 State owned.

B1 Independent unit and management.

B2 Mileage-wise maintenance and overhaul schedule

B3 Workshop Complex.

1) Shed :

for routine maintenance, lubricating, inspection pits, minor repairs involving not more than 4-5 hours vehicle idle time.

2) General Mechanical Shop :

Equipment : 4 lathes for wheels, 8 ordinary lathes, 7 of which as good as new, 2 milling machines, 2 shaping machines, one blade grinding machine, 2 crankshaft grinding machines, 1 slotting machine, 1 alternating saw, 2 radial drilling machines, 1 DO-ALL saw, 1 hydraulic circuit checking set.

Adjoining : a machine tool maintenance shop.

3) Rolling Stock Maintenance Shop :

a) Motor overhaul : disassembling and reassembling outfit. Crankshaft true grinding is carried out in France : crankshafts are returned complete with new bearings.

b) Wheel overhaul : forge-replacing of wheel tyres, lathetrue, or built up by welding with special machine (out of action).

c) Electrical shop : routine maintenance, true grinding of collectors. Repair, as required, of generators and traction motors (rewinding done by ALSTOHN).

ANNEXE 1 (suite)

- d) Pneumatic equipment overhaul (electro-pneumatic valves, reducing valves, sand boxes). Apparatus test bench (klaxons, windscreen wipers, etc...).
 - e) Foundry : sand casting, sand treatment by hand (2 castings per month) 2 cupola furnaces and 2 crucible furnaces (the latter for bronze and aluminium) 30 metal moulding boxes in good condition, hand coring, 1 pneumatic rammer.
 - f) Wagon shop : with inspection pits, 15 t overhead travelling crane.
- B4 Quite inadequate. Mostly motor and heavy mechanical parts are missing. No store to be seen.
- B5 800 workmen and foremen.
- C1 Inadequate.
- C2 Shortage of spare parts. The following items in particular are missing : Diesel engine case gaskets, rewinding wire, pressboard insulating material, cutting tools, true grinding wheels, anti-friction bearing metal, foundry sand, cast iron and steel grades.
- Equipment : there are no parts for the repair of some machine tools.
- Staff qualifications : good workmen and foremen with experience.
- Managerial staff is young, foreign trained, but still lacking in experience.
- C3 Minor.
- C4 In addition to the supply of missing spare parts and items of equipment, it is desirable to provide technical assistance at managerial staff level.
-

APPENDIX 2

- A0 ATELIERS DES PONTS ET CHAUSSEES (Highways and Civil Engineering Department)
- A1 Not obtained.
- A2 Road equipment maintenance and repair
- A3 After reorganisation : routine maintenance of 200 vehicles.
- A4 Not known for certain but seemed low.
- A5 Importance in relation to road maintenance.
- A6 Units (bulldozers, graders) left there by foreign concerns at the time of road building and development. (List of plant not available to us).
- A7 Guinean managerial staff and workmen. USSR assistance including 5 experts. 25 workmen for Shop I.
- A8 State owned.
- B1 Reorganisation undertaken under technical assistance scheme. Work distributed over two existing workshops : Shop I (km 4) for minor maintenance service (lubricating, checking), Shop II (km 17) for heavy repair work.
- Reconstruction also provides for preventive maintenance to bring down spare part consumption. There are other small shops in the country, fitted out for the sort of job here considered. They will be converted to centre-garages, one for each natural region (Lower-, Middle-, Upper- and Forest-clad Guinea).
- B2 See B1.
- B3 Shop I : divided into mechanical shop (lathe, drilling machine, shaping machine), overhaul of assemblies (rear axles, gear boxes), electrical workshop, tyre servicing shop (vulcanising), motors and injection workshop.
- Shop II (not seen) : same plant as Shop I, with bulky equipment disassembling area. Has got a crankshaft grinding machine.
- B4 No spares. Planned : the setting up of a spare part service.
- B5 See A7. No details concerning Shop II. The project provides for training directed to specialised jobs.
- C1 Inadequate.
- C2 Machines too few in number. A small number of new machines are waiting to be received. Some jobs given out to other shops. Amount of work has gone up as a result of heavy-duty use of equipment. Labour qualifications.

APPENDIX 2 (suite)

- 03 Important due to equipment disparity. Standardisation is aided by assistance project.
 - 04 Technical assistance in progress.
-

APPENDIX 5

- A0 SOCIETE DES TRANSPORTS URBAINS DE CONAKRY (T.U.C.)
- A1 Not obtained.
- A2 Bus maintenance and repair.
- A3 For a fleet of 50 buses.
- A4 Practically inactive.
- A5 Small.
- A6 Buses of different makes.
20 INTERNATIONALS (in 1966), 9 MACKS (in 1964),
8 FORDS, 5 IKARUS (1959), a few GMC's (1965).
- A7 Not obtained.
- A8 State owned.
- B1 Several sections, each with a responsible leader under the management of a responsible Chief Engineer.
- B2 No preventive maintenance programme.
- B3 Shops set out round central yard, unobstructed and easy of access.
- 1) Service station : (equipment dismantled).
 - 2) Engine overhaul shop : with a small number of machine tools in bad condition and without cutting tools.
 - 3) Injection pump test bench in working order, but only suitable for IKARUS pumps.
 - 4) Electrical shop : dynamo and starter control benches (the coupling rubber parts are missing).
 - 5) General Mechanical Shop : with a number of machine tools (4 lathes, grinding machine, alternating saw), several of which are short of essential parts and tools.
 - 6) Coachwork (sheet-metal work) : bending machine, shearing machine, welding set in working order.
 - 7) Workshop-lorry (1966) : of CHEVROLET make, fitted with small machine tools : lathe, drilling machine, valve refacing machine, dynamo, grease gun, battery charger, frame-mounted grinding wheel, winch. The tool chest is empty and the lorry has broken down.
 - 8) Tyre servicing shop : at a standstill. No tyres. Vulcanising machine out of order.
- B4 No spares.
- B5 50. Several members of managerial staff trained abroad.

APPENDIX 3 (suite)

- C1 Inadequate.
- C2 Shortage of spares, condition of equipment. As the shops were inactive, we were not able to assess labour standards.
Managerial staff young, short of experience.
- C3 Important, as there are several makes.
- C4 Technical assistance for the entire reorganisation of these shops.

Note : Only the MACK buses, serviced by SOMOVA (App.13) are in running condition.

APPENDIX 4

- A0 ATELIERS DU SERVICE DES MINES ET DE GEOLOGIE
(MINISTERE DES MINES ET DE L'INDUSTRIE)
(Mining and Geological Department Workshops - Ministry
of Mines and Industry)
- A1 Not obtained
- A2 Maintenance and repair of transport vehicles (lorries).
- A3 Not obtained.
- A4 Not obtained.
- A5 Small.
- A6 A few Mining Department vehicles (cars, jeeps) and
vehicles belonging to the USSR geological prospecting
service (list not obtained).
- A7 Guinean managerial staff, 40 workmen (est.).
- A8 State owned.
- B1 No definite structure.
- B2 No programme, practically inactive.
- B3 General mechanical and engine overhaul shops with a
small number of machine tools (lathe, shaping machine,
cylinder-block boring machine, crankshaft grinding
machine).
- B4 No spares. From time to time, some supplies through
USSR geological prospecting service.
- B5 See A7.
- C1 Inadequate.
- C2 In the event of vehicle fleet extension, these shops
should be refitted out with equipment and spare parts.
- C3 Important in view of miscellaneous equipment.
- C4 See C2.
-

APPENDIX 5

- 1 A0 FRUITAGUINEE '
- A1 1961.
- A2 Production of sparkling fruit juice from juice concentrate.
- A3 4,500 1/3 litre bottles per day.
- A4 3,000 bottles.
- A5 100 p.c. Guinean concern.
- A6 Bottle rinsing-out and disinfecting machine, 4 filling and capping automatic machines. A small number of spare handoperated machines.
- A7 60 workmen, no managerial staff. One supervisor only.
- A8 Private concern. /
- B1 No maintenance service.
- B2 No schedule covering lubricating at regular intervals, repairs as required.
- B3 No maintenance equipment.
- B4 No spares. One production machine has been scrapped. Necessary parts taken from machine scrapped for this purpose. Supplies often obtained by air.
- B5 See A7.
- C1 Inadequate.
- C2 Lack of spares.
Shortage of maintenance personnel, no programme.
- C3 Small.
- C4 Setting up of maintenance service with responsible person in charge, especially as they intend replacing the production equipment by high unit capacity automatic machines.
-

Total investment : 12 million \$.
No. Spindles : 20,000
Capacity : 2.6 million metres a year.
Deliver production in 6 months.

APPENDIX 6

- A0 COMPLEXE TEXTILE DE SANOYA**
- A1 1965.**
- A2 Cotton spinning mill, weaving mill and printing.**
- A3 22 million metres of cotton fabric p.a.**
- A4 25 % - Reason : shortage of spares (part of the machines and air conditioning system stopped). In addition, works short of raw materials.**
- A5 Only textile works in the country.**
- A6 Spinning : 20,000 spindles, 10 cone bobbin frames, 9 cop hobbin frames, 2 sizing machines, 48 cards, air conditioning units.**
Weaving : 700 looms (Make : MATHER & PLATT).
- A7 800, including 40 managerial staff + foremen. Foreign (British) assistance, including 4 specialists, still being provided on the spot.**
- A8 State owned.**
- B1 No independent maintenance service; attempts to establish one.**
- B2 Daily lubricating of machines by operator. End-of-week check by gang of mechanics. Work according to maker's directions.**
- B3 Setting up of mechanical shop with machine tools coming from "LA MINIERE" Company. Several of these machines need repair; many essential spare parts missing. It is contemplated to manufacture a few small spare parts (axles, gears) and to carry out true grinding work (e.g. on inking rollers).**
- B4 Disquieting situation : general shortage of spares. Several machines are not working and have partly been taken apart to provide spare parts for other machines. For instance, 17 cards out of 48, 1 bobbin frame out of 8, 360 looms out of 700 (70 of which are entirely dismantled). Lack of rewinding wire (essential for 2,000 motors in operation), insulating material, cables.**
Also missing : welding rods and certain products yet available on the local market : gas oil, wood, small tools, nails, glycerin, etc...
Stocks of iron, steel, cast iron and bronze grades are present.
- B5 A few good workmen transferred from the production department : welders, electricians, mechanics. Local training under technical assistance scheme, but rather directed to machine operating, and little or not to maintenance.**

APPENDIX 6 (suite)

- C1 Inadequate.
 - C2 Shortage of spare parts.
Equipment (shops poorly fitted out).
Independent service with responsible head does not exist.
Labour qualifications.
 - C3 Small.
 - C4 Setting up of independent maintenance and repair service with programme, personnel, equipment.
-

APPENDIX 7

- A0 MANUFACTURE DE CHAUSSURES - USINES MILITAIRES DE
CONAKRY - U.M.C.
- A1 1966 (R.F.A. technical assistance still being provided
on the spot).
- A2 Shoe manufacture.
- A3 180,000 pairs of shoes p.a.
- A4 Varies according to models.
- A5 Only shoe manufactory in the country.
- A6 SANDF pinking machines, SINGER or PFAFF sewing machines
(about 20), shaping and gluing machines.
- A7 100.
- A8 State owned.
-
- B1 No independent maintenance service, but one person in
each section responsible for production equipment main-
tenance. This work therefore comes under the control
of the production supervisor. Assistance provided by
central workshop responsible for the maintenance of
general services and buildings.
- B2 No preventive maintenance programme. Maintenance is
taken care of by a specialist belonging to the firms
of suppliers and who trains the corresponding Guinean
staff.
- B3 Small local shop with small machines suited to the
type of manufacturing equipment.
- Central Shop : several sections.
- Mechanics : modern machine tools (3 lathes, 2 shaping
machines, 1 engine-block boring machine, 1 crankshaft
grinding machine, etc...).
- Electricity : current work, no rewinding.
- Sheet metal work : folding machine, saw, welding sets.
- Joinery : composite machine, band saw, surfacer.
- Tyres : vulcanising machine, balancing machine.
- Coachwork with spray booth.
- Diesel : injection pump control.
- Car electricity : checking of dynamos, battery chargers.
- Greasing station with inspection pits.
- B4 Stock of essential spares in well kept stores.
Raw materials and tooling available.
Use occasionally parts made of salvaged equipment as a
source of raw materials.
- B5 See B1. Personnel locally trained, in particular by
machine-tool specialists. Combined theoretical tuition
and practical training.

APPENDIX 7 (suite)

- C1 Adequate.
- C2 Labour qualifications.
- C3 Small.
- C4 Nil.

APPENDIX 8

- A0 CONFECTION VETEMENTS - USINES MILITAIRES DE CONAKRY - U.M.C.
- A1 1960 (R.F.A. technical assistance still being provided on the spot).
- A2 Clothes manufacture.
- A3 100,000 units p.a.
- A4 Depends on types of clothes and availability of raw materials.
- A5 Only clothes manufactory in the country.
- A6 One hundred odd SINGER type 196 K305 sewing machines fitted with $\frac{1}{2}$ HP 2,800 rpm motors.
Ironing presses.
- A7 210.
- A8 State owned.
- B1 No independent maintenance service but a responsible person per section for production equipment maintenance. Such maintenance therefore comes under the control of the production supervisor. Assistance provided by central shop, responsible for general services and buildings (see App. 7).
- B2 No preventive maintenance programme. Maintenance taken care of by a specialist belonging to the firms of suppliers and who trains the corresponding Guinean staff.
- B3 Small shop with small machines suited to the type of manufacturing equipment.
- B4 Stock of essential spares in well kept store.
- B5 See B1. Personnel locally trained.
- C1 Adequate.
- C2 Labour qualifications.
- C3 Small.
- C4 Nil.
-

APPENDIX 9

- A0 TANNERIE - USINES MILITAIRES DE CONAKRY U.M.C.
 - A1 1966 (R.F.A. technical assistance still being provided on the spot).
 - A2 Tanning of hides.
 - A3 1,000 t/p.a. of hides.
 - A4 Depends on stock of hides.
 - A5 Only tan yard in the country.
 - A6 Modern equipment and machines (fulling machines, alitting machine, suppling machine, dyeing machines, etc...).
 - A7 70.
 - A8 State owned.

 - B1 No independent maintenance service. Maintenance under the care of the production supervisor. Assistance provided by Central Shop (see App. 7).
 - B2 No preventive maintenance programme.
 - B3 Small local shop with machines suited to the type of production equipment. Central Shop (see App. 7).
 - B4 Stock of essential spares in well kept store.
 - B5 See B1. Personnel locally trained.

 - C1 Adequate
 - C2 Labour qualifications.
 - C3 Small.
 - C4 Nil.
-

APPENDIX 10

- A0 ENTREPRISE NATIONALE DE TABAC ET ALLUMETTES : ENTA
A1 1964.
A2 Manufacture of cigarettes and matches.
A3 24,000,000 packets of 20 cigarettes and 45,000,000 boxes of matches p.a.
A4 80 % as a result of extensive stoppage. We were not able to find out whether stoppage was ascribable to a lack of skill on the part of personnel, want of machine maintenance or something wrong with the machines. Presumably a combination of these three factors.
A5 The only concern in the country engaged in the manufacture of cigarettes and matches.
A6 Tobacco processing : damping, heating, rolling, chopping machines.
Conveyor.
Cigarette manufacture : 6 machines, dryer, packing machines.
Match manufacture : reel, cutting machine, match and box manufacturing machines, packing machine.
General services : boiler room, substation, etc...
A7 Approx. 600 people.
A8 State owned.

B1 Independent service with responsible head.
B2 No preventive maintenance programme.
B3 Suitably fitted out shop : 3 lathes, 1 shaping machine, 5 drilling machines, etc... in good working order. Cutting tools are missing.
The shop has designed and produced a few small machines (alternating saw, glue producing machine), which denote initiative and the availability of technical means.
B4 Adequate quantity of spare parts fairly well stocked (too little space). Parts are numbered with stock and order progress cards kept up to date. Store containing bars and sections.
B5 Not obtained.

C1 Slight deficiency. Much labour is required to make up for machine failure.
C2 Personnel qualifications.
C3 Small.
C4 Nil.

- A0 USINE DE MEUBLES DE SONFONIA**
- A1 1964.**
- A2 Furniture manufacture and building joinery.**
- A3 56,000 pieces of furniture/10,000 parts for the building trade p.a.**
- A4 6,000 and 450 (various reasons including : shortage of raw materials, condition of production plant).**
- A5 Only mechanised joiner's shop in the country.**
- A6 Joinery plant (MAXIMO-IMPEX make) (Yugoslavia) (planers, surfacers, band saw, etc...).**
- A7 200 people, including 1 Manager, 20 foremen, 25 clerks (Foreign assistance : 3 experts : boiler room, book-keeping, drawing office).**
- A8 State owned.**
- B1 Independent maintenance service but structurally indefinite.**
- B2 No preventive maintenance programme.**
- B3 Maintenance shop with lathe, drilling machine, milling machine, shaping machine in working order, able to turn out simple spare parts.**
- B4 No provisionment since 1966. Disquieting situation. The missing items are mainly machine driving gear (V-belts, grooved pulleys, etc...) and cutting tools.**
- B5 Not obtained, but put at 6 workmen.**
- C1 Inadequate.**
- C2 Shortage of spares. Substandard qualifications of managerial staff and foremen.**
- C3 Small.**
- C4 Supply of spares. Unsuccessful attempt to develop driving gear using leather belts and wooden pulleys. Theoretical tuition for production labour, otherwise highly skilful and experienced (15 years' practice), but having not the necessary basic knowledge for mass production (f.i. reading of drawings). This problem has been referred to UNESCO.**
-

APPENDIX 12

- A0 INSTALLATIONS FRIGORIFIQUES DU PORT MARITIME (CONAKRY)
(Seaport Refrigerating Plant)**
- A1 1963.**
- A2 Foodstuffs preservation and ice production.**
- A3 Cold store capacity : 599 sq.m or 150 t of fish and
100 t of sundry products. Ice : 15 t per day.**
- A4 Daily ice production fallen to 7 t due to bad condi-
tion of cooling water pipework (sea water - corrosion).**
- A5 Only refrigerating plant in Guinea.**
- A6 Reciprocating compressors with accessories and coolers.
Ice machine. New ice-block production unit being
erected (18 t per day).**
- A7 41 (including management and administrative staff).**
- A8 State owned.**
- B1 Maintenance service being set up with USSR technical
assistance (3 technicians + 1 interpreter).**
- B2 Normal maintenance according to programme (lubricating,
checking, overhaul). The absence of reserve produc-
tion capacity (especially ice production) does not
always permit the carrying out of overhaul work when
due.**
- B3 No maintenance shop (not required).**
- B4 Spares available in fairly large quantity (even
compressor frames). Storage not up to the mark.**
- B5 2 Guinean technicians are being locally trained under
the technical assistance scheme. Manager is a refrige-
rating engineer trained in USSR.**
- C1 The lack of installed reserve production capacity does
not always permit the carrying out of overhauls when
due. The situation will be improved as a result of
the extension of the ice production plant.**
- C2 Use of seawater for refrigeration.**
- C3 None (only one type of compressor and supplier).**
- C4 Nil.**
-

- A0 **SOMOVA (SOCIETE DE MONTAGE DE VEHICULES AUTOMOBILES)**
- A1 1965.
- A2 Assembling of lorries (of American make).
- A3 1,000 lorries p.a.
- A4 40/50 % (market).
- A5 Only assembly shop of the kind in the country.
- A6 Assembly line with handling equipment (overhead travelling cranes), welding sets, control gear, spraying outfit. The company contemplates to extend its operations to the manufacture of a small number of simple components (e.g. running-board hangers, parts for body, gears, wheel studs, etc...) and to the assembling of gear boxes, engines and rear axles.
- A7 190 workmen. European Manager.
No special experience required on being taken on (only C.A.P. - Certificat Aptitude Professionnelle) (Occupational Proficiency Certificate), local training, further training abroad (? at present in U.S.A.), e.g. injection pump adjusting specialist.
- A8 Mixed company. Guinean State 51 %, private 49 %.
- B1 Does not apply (Assembly Shop).
- B2 do.
- B3 do.
- B4 do.
- B5 do.
- C1 Adequate. Well organised and supervised shop, using skilled labour. Occasional spare part problems due to the very structure of the company (administrative formalities or short credit). Thus a number of lorries are waiting for spares.
- C2 None.
- C3 Small, as equipment is undiversified.
- C4 Nil.
-

APPENDIX 14

- A0** BRIQUETERIE DE COBAYA
- A1** 1964. *→ for normal bricks, a 2.5 million of bricks B10,*
- A2** Bricks and tiles.
- A3** 7.2 million bricks, 8.4 million tiles p. a.
- A4** 100 % for bricks. No tile production (quality of clay - porous tiles).
- A5** Only brick works. Country needs 12 million bricks p.a.
- A6** WESERHUTTE 15 cu.m/hr excavator.
2 24HP 1955 VINKOVIC Diesel locomotives on narrow-gauge track. Power shovel, 2 clay mills, 2 crushers, 2 brick presses. Dryer (60 drying chambers each to hold 3,500 bricks), brick kiln (22 chambers each to hold 22,000 bricks) using fuel oil (16 burners).
- A7** 70 workmen and foremen. European engineer (Direct Assistance).
- A8** State owned.
- B1** Independent service. *no independent source.*
- B2** Regular maintenance programme but no preventive maintenance.
- B3** Mechanical workshop with lathe, shaping machine, shearing machine, forge, arc welding sets.
- B4** Store well provided with spares. Full equipment of 16 new burners in stock. Occasional provisioning difficulties (delays).
- B5** Suitable labour; locally trained.
- C1** Adequate.
- C2** None. Due to no tile production, workshop has two each of part of the items of equipment, which facilitates maintenance.
- C3** Small.
- C4** Nil.
-

- A0** AGRIMA (SOCIETE D'IMPORTATION DE MATERIEL AGRICOLE)
- A1** Subsequent to establishment of Home Rule.
- A2** Importation and distribution of equipment and materials for agriculture, such as : machines, equipment, seeds, fertilisers, etc...
- A3** 1,268 tractors imported since 1960, 70 before 1960.
- A4** Does not apply.
- A5** Considerable as Guinea is predominantly an agricultural country. Technical appliances are used for the growing of wheat, millet and other food crops. These require in particular for their development the use of three-disc tractor ploughs, spraying equipment and conveyance (lorries, tractors).
- A6** Tractors of various origin :
UNIVERSAL (Rumania) 500 to 600 units, imported in 1967.
ZETTOR (Czechoslovakia) 68 units, imported in 1963.
ZADUGAR (Yugoslavia) FERGUSSON - MAN - FIAT.
Caterpillar tractors of USSR origin, imported in 1963.
- A7** Does not apply.
- A8** State owned.
- B1** Maintenance centres in each chief town : MAMOU, KOUNDARA, DABOLA, FARANAH, KANKAN, SIGUIRI, BEYLA and N'ZEKEKORE.
- B2** No definite programme to our knowledge.
- B3** Garage equipment, as well as workshop-lorry for mobile service.
- B4** Tractors are delivered complete with the respective spares and regular stock replenishment of same.
- B5** Personnel locally trained by technician delegated to this task by supplier over period of guarantee. The efficient running of the centre depends on the measure of ability of the person in charge.
- C1** Seems adequate, but we were not able to see for ourselves.
- C2** We entertain doubts regarding the workshop-lorries, which are probably incomplete.
We obtained no more definite information either concerning personnel qualifications. There is a training centre at ka 9 Conakry.
- C3** Considerable, as equipment is very diverse.
- C4** Standardisation.
-

A0 HOPITAL DE DONKA (CONAKRY)

A1 1957.

A2 Hospital with operating rooms and various therapeutic treatment installations (rays).

A3 100 beds.

A4 100% and over.

A5 Only hospital in Conakry.

A6 Equipment not fully installed at the time Home Rule was established.

Has been supplemented with equipment coming from East European countries, particularly Czechoslovakia.

Communal installations (kitchen, wash-house).

Sterilising rooms, X-ray apparatus, encephalograph, electro-cardiogram, operating units, boiler room (1957 and 1964 10 kg/sq.cm BCUTILLAT boilers), OTIS lifts (1959).

A7 Guinean medical staff.

A8 State owned.

B1 Small maintenance team with Guinean in charge.

B2 No programme.

B3 No equipment or shops. A few tools.

B4 Practically no spares.

B5 A few maintenance hands under the control of a Guinean foreman.

Czechoslovakian technician, assisting for radiology equipment.

C1 Inadequate.

C2 Equipment : several items (X-ray apparatus in particular) have not been treated for tropical duty and do not stand up to the very damp atmosphere of Conakry; so they cease to work after a short time.

We noted the following in the communal services :

- wash-house : motors of spin dryers to be replaced, baskets of both washing machines as well.

- kitchen : cold stores : 1 unit out of 4 in working order. Practically no cold.

- boiler room : boiler working under 3 kg/sq.cm pressure, as all taps and fittings are worn out.

Lifts not working for want of maintenance.

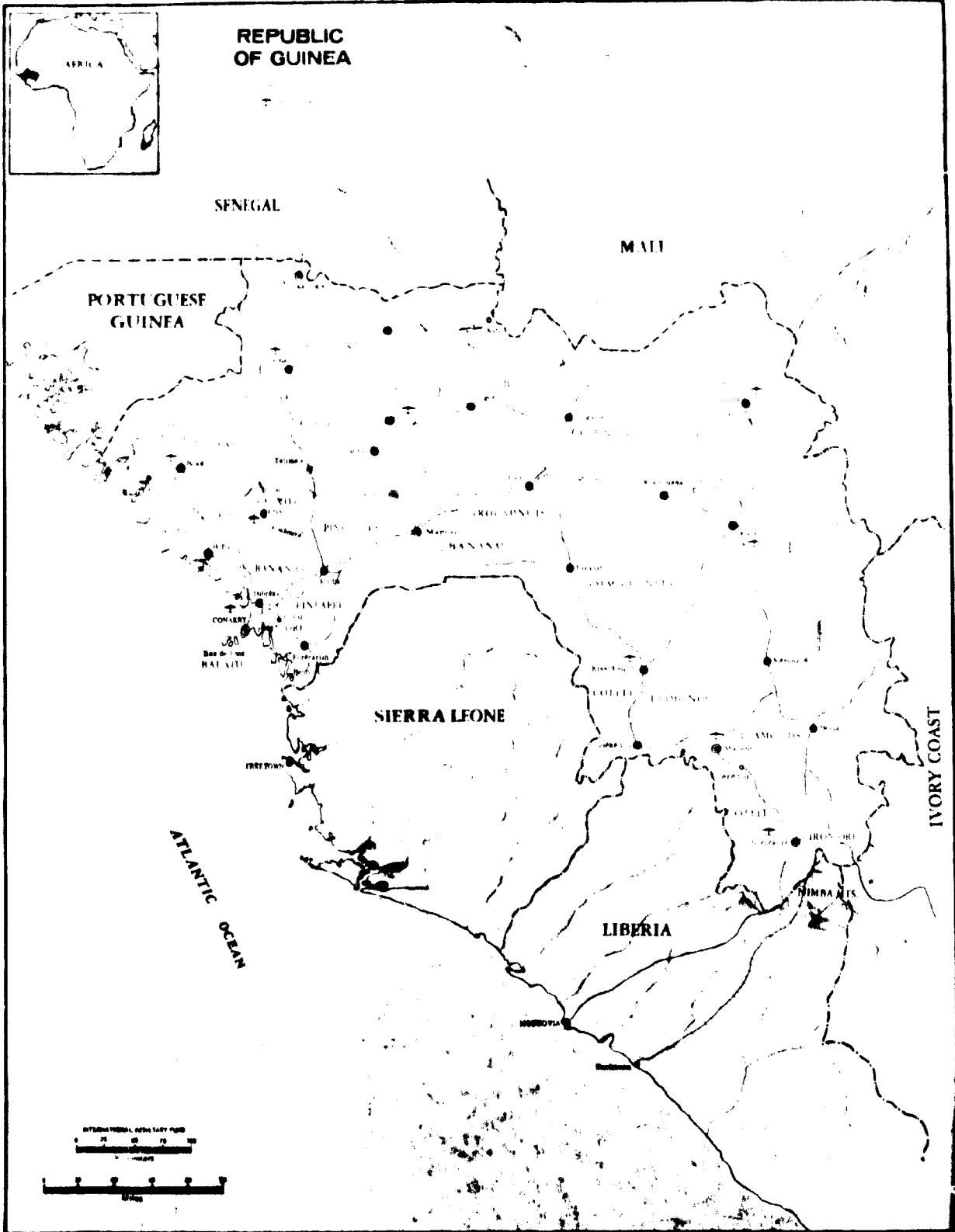
X-ray table positioning mechanism no longer working.

The remote foot-control switch of a dentistry apparatus is in bad condition.

The hospital has no stand-by generating set; in case of electricity cut, it is sometimes necessary to perform operations by torchlight.

C3 Small.

C4 Technical assistance in view of very serious inadequacy. It is mostly necessary to complete the building, unfinished when Home Rule was established and left so since.





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