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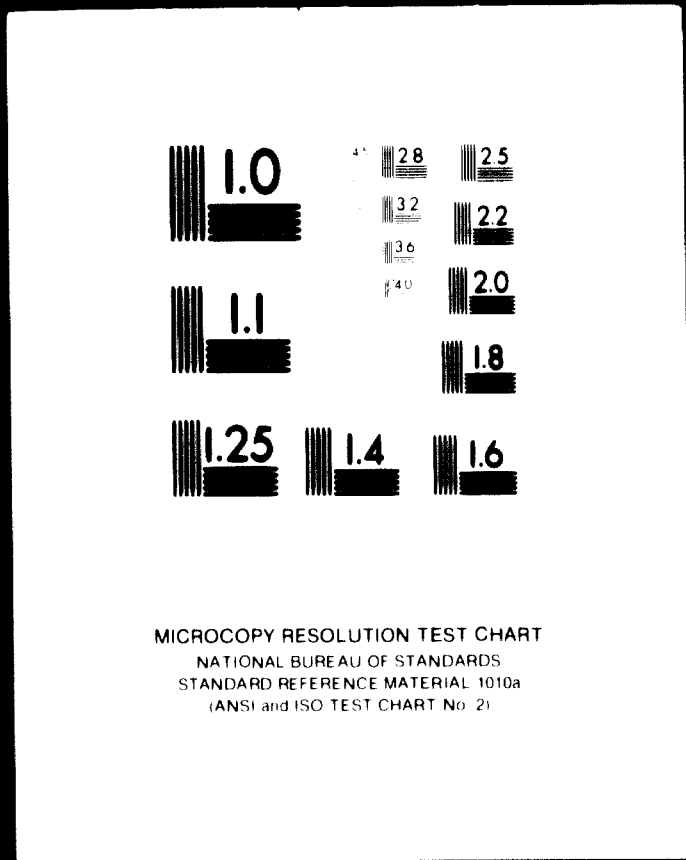
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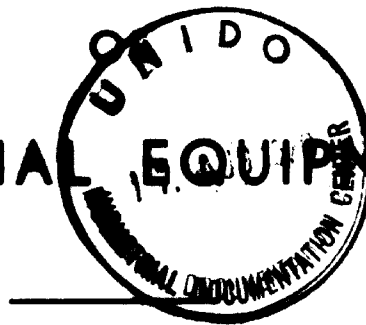
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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

02540-E

REPAIR AND MAINTENANCE

INDUSTRIAL EQUIPMENT



**SURVEY CONDUCTED IN THE
REPUBLIC OF GUINEA**

RESEARCH AND DEVELOPMENT

CONSULTING ENGINEERS

1969

REPAIR AND MAINTENANCE OF INDUSTRIAL EQUIPMENT

SURVEY CONDUCTED IN THE

REPUBLIC OF GUINEA

IN JANUARY 1969

02540-E

FOR

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

BY

R. LIEMART AND G. DE LIEUV, ENGINEERS

MEMBERS OF RESEARCH AND DEVELOPMENT

BRUSSELS 1 - BELGIUM



May 1969

INTRODUCTION

1. GENERAL STATEMENTS AND DEVELOPMENT OF THE MISSION

January 7 : Mission arrives at CONAKRY.

Conversation with UNO Resident General. Steps for visa and meeting with local Authorities.

January 11 : Conversation with Departmental Head of Economic Development Ministry. Mission exposes object of survey and obtains authorization to visit industrial concerns.

One representative of Economic Research and Statistics Office (BRESS) and one representative of Industrial Coordination and Control Office (B.C.C.I.) are appointed to organize the visits.

January 13 : Meeting at the B.C.C.I. to set up action programme.

January 14 to 27 : Visits of concerns (see below).

January 27 : Meeting with representative head of Economic Development Ministry and with UNO General Resident

January 28 : Mission leaves Conakry.

2. LIST OF PERSONS ENCOUNTERED

Mr ROSSI, UNO Resident General in Guinea

Mr SYLLA LAMILLE, Chief of Department - Ministry of Economic
Development

Mr SAKHO DAMOU, Chief of Department - Economic Research and
Statistics Office (BRESS)

Mr BAH BOUBACAR, Chief of Department - Industriel Coordination
and Control Office (BOCI)

Mr DIALLO DIOUNA, BRESS Representative

Mr BARRY, Engineer at the Ministry of Industry and Mines

3. LIST OF SURVEYED INDUSTRIES AND MEETINGS

Dates	Visited Center	Visit organized by	Persons encountered
<u>1969</u>			
1.7	Arrival of Mission at Conakry		
1.7.	UNO	-	Mr ROSSI, UNO Resident General
1.8 to 11	Steps to obtain visa and authorization to visit concerns		
1.9	UNO	Mission	Mr BOUGNET, Chief ILO Mr KALANDVIC, Expert ILO
1.11	Ministry of Economic Development	UNO	Mr SYLLA LAMILLE, Departmental Chief of Ministry Mr SAKHO DAMOU, Departmental Chief of BRESS Mr BAH BOUBACAR, Departmental Chief of BCCI
1.13	Ministry of Economic Development	-	Mr BAH BOUBACAR, Departmental Chief of BCCI Mr CHERIF, Chief Engineer Ministry of Industry and Mines (* Mr DIALLO DIOUMA, BRESS Representative (* Mr BARRY, Engineer Ministry of Industry and Mines
1.14	Seaport Refrigerating Plant	Ministry of Economic Development	Mr GUILAVOGUI, General Manager, Chief-Engineer of Foreign Technical Assistance
"	Mining and Geological Department Workshop	"	Chief Engineer

(*) Appointed Guides to the Mission

Dates	Visited Center	Visit organized by	Persons encountered
1.15	SOMOVA (Société de Montage de Véhicules automobiles) Highways and Civil Engineering	Ministry of Economic Development "	Mr VERHOEVEN, General Manager Mr NIANE, Chief Engineer
16.1	Preliminary visit to Railway Company Fruitaguinée Preliminary visit	" "	Mr TOURY, General Manager Proprietor
1.17	Railway Company Workshops Fruitaguinée	" "	Workshop engineers Proprietor
1.18	SONFONIA Furniture Manufactory ENTA Tobacco Works	" "	General Manager ENTA Representative
1.20	T.U.C. Conakry bus transport Cy SANOYIA Textile Works	" "	Chief engineer Chief engineer of Technical Assistance
1.21	Visits put off for no transport facilities	-	
1.22	Usines militaires	Ministry of Economic Development	Technical Assistance Head of Mission
1.23	COBAYA Brickworks AGRIMA (Government Offices for Import and Distribution of Agricultural Plant)	" "	M. TOURE, General Manager Mr ENBROUGH, Technical Manager (Yugoslavia Technical Assistance) Manager
1.24	Ministry of Public Health	Mission	Dr KEITA Dr Mrs VERHOEVEN (Technical Assistance)

Dates	Visited Center	Visit organised by	Persons encountered
1.25	Visit of Polytechnic College of Conakry, cancelled for reasons unknown to the Mission		
1.27	DONKA Hospital Ministry of Economic Development UNO	Dr KEITA - Mission	Dr Mrs VERHOEVEN Mr SYLLA LAMILLE } Mr BAH BOUBACAR } Mr BOSSI
1.28	Departure of Mission		

The mission wants to express thanks to the Guinean Authorities and especially to Mr BAH BOUBACAR, Mr DIALLO DIOUMA and Mr BARRY, for their obliging assistance.

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 this equipment is generally unsatisfactory and has a detrimental effect on production.
- 3°) Urgent action is essential to avoid destroying 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 :

- 1°) As short-term action :
 - a) 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.

- b) 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.
- c) 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.
- d) the grant of funds in foreign currency being immediately available to the above-mentioned experts at their demand and intended to purchase spare parts and tools.

2°) As long-term action :

- a) the drawing up of a training programme including :
 - 1. the grant of refresher course scholarships in the field of maintenance and repair
 - 2. an action with the I.L.O. in order to include in their teaching programme, courses on industrial equipment repair and maintenance.
- b) the provision of raw materials for the manufacture of spares.
- c) the provision of supplementary equipment and tooling for the erecting of a spare parts manufacturing and assembling shop.

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II. INTRODUCTION

A. SUBJECT

The UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (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 schema for developing countries covering maintenance and repair facilities.

C. LINES OF REPORT

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

Then, for surveying purposes, we selected a number of concerns among the various existing industrial sectors 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, because this sector is entirely in the hands of strong foreign assistance which also looks after all problems arising in this field.

The analysis and study of the information thus collected provided a picture of the Maintenance and Repair set-up of the surveyed Industries, as well as their position with spare parts.

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.

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	<u>12,6</u>
Total	100,0

A few new industries have since then been established in the country : Usine Textile de SANOYA, Usines militaires, Complexe de FCULAYAH (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.

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

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.

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 IBRD report mentions 41 manufacturing units. 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 out 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 call on :

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

(*) Chapter II.C.

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 SONFONIA (furniture)

c2) Intermediate Goods Industries

9. Usines militaires (leather)
12. Entrepôts frigorifiques du Port (Harbour Cold Stores)

c3) Investment Goods Industries

13. Société de Montage 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 production equipment, and finally the poor condition of maintenance equipment (machine-tools and tooling).

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

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

All industries in this sector, except one, enjoy foreign assistance acting in various fields of industry but mainly in the setting-up, maintenance and repair of production machinery. For such assistance, action also includes training of personnel for maintenance work, and provision of spare parts. When assistance becomes weaker, such as at the ENTA-works where several experts have gone, or at the SANOYA textile works where spare parts provision has become restricted, things rapidly go wrong and production is lost. This to show how much concerns in this sector depend on abroad.

4) Agricultural Sector

This sector presently is not affected by maintenance problems. Those are solved mainly by technical assistance given by the supplying firms of equipment.

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°) As short-term action

a) 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 tasks of this Advisory Department should be to arrange for a planned spare part provisionment of industries, to undertake the training and the providing of advisory service to the people responsible for equipment maintenance and repair and to set up a central spare parts manufacturing shop.

b) 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.

c) 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.

d) the grant of funds being immediately available to the above mentioned experts' demand and intended to purchase spare parts, both for production plant and for maintenance equipment and tooling.

2°) As long-term action :

a) The drawing up of a training programme including :

1. the grant of 6 refresher course scholarships in the field of maintenance and repair of textile equipment (2 sch.), explosion motors (2 sch.), hospital communal installations (1 sch.) and machine-tools (1 sch.).
2. an action with the I.L.O. in order to include in their teaching programme, courses on industrial equipment maintenance and repair.

b) The provision of raw materials for the manufacture of spares.

c) The provision of supplementary equipment and tooling for the erecting of a spare parts manufacturing and assembling shop, in conformity with advices given by the experts specified under 1°) a) above.

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 and a working programme.

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

Their equipment covers the full range and it is suitable for the kind of work to be done 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.

All these plants are owned by the Guinean State.

- c) Spare part provisionement 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.

(*) 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.

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) 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 and could not be extended to highly mechanized components such as parts for internal combustion engines.

2) Road Transport

General

- a) We shall confine our survey to the position with the Maintenance and Repair of road maintenance equipment. Such equipment is rather scarce in this country and the few existing is in very bad condition and practically out of use. It is what remains of the equipment left by foreign road-making contractors.
- b) The Administration des Ponts et Chaussées (Highways and Civil Engineering Dept) has got two maintenance shops near Conakry. These are presently being reorganized with foreign assistance.

They have not all the equipment needed to carry full range maintenance and repair and what exists must be reconditioned.

Being in reorganization, we could not appreciate on the work carried out by these shops.

- c) There is no stock of spare parts. Their provisionment is a major problem and the varying origins of the equipment makes things worse.

d) These shops are not fitted out for the production of spares for this equipment, especially as the components are of a high mechanical quality, mostly forged.

e) There is no organized spare part store.

Public Passenger Transport

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

b) The specialized sections are : electricity, tyres, coachwork, engine overhaul, injection. All are properly set out round a large yard.

But most of the outfit 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 1965, only 15 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) There are neither spare parts nor foreign currency to bring them in with.

d) Considering the condition of the machine-tools, it is actually almost impossible to turn out decent spare parts.

e) There is no spare part store.

B. MINING SECTOR

- a) The "Administration des Mines et Géologie" has a maintenance and repair workshop for its lorries and sundry vehicles. It is now attending to the maintenance of appliances belonging to a foreign geological mission.
- b) This shop has the requisite standard equipment, but 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.

It 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) Most concerns in this sector have their own maintenance and repair service. The working of this service depends largely on the aid obtained from the foreign technical assistance.
- b) There is no independent or State-owned central repair workshop. (The "Usines militaires" have a central workshop but its activity is confined to own needs, accepting no work for other industries).
- c) All concerns have spare part problems at various degrees. The older ones (Sanoya textile works, Sonfonia furniture workshops) have no spare parts, the stocks being used up and not reordered.

Cobaya brick works is in a better position, stocks being maintained because country's want for bricks.

ENTA-works is in a favoured position, receiving large supplies of spares from the technical assistance.

As for the "Usines militaires", the works are still young and the stocks are sufficient, being not yet broken into.

- d) A small number of spare parts could be produced within the concerns, their workshops being sufficiently well fitted out to do so, at least for common lathe-turned or milled parts, but raw materials are missing.

As for castings, the only existing foundry is no longer able to produce decent parts.

- e) Each concern has its spare parts store, generally well kept when spare parts are sufficient (ENTA, Usines militaires). In the other cases, stores are rather untidy.

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 now being used for the development of some crop farming (wheat, millet and other food produce).

Before 1960, there were seventy tractors in the country. 1,260 tractors have since been imported, more than half later than 1967.

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) As the spare parts are nearly all of a complex nature, they can not be manufactured locally. There is no central workshop or other able to do so.
- e) AGRIMA's manager has told the mission that agricultural equipment did not suffer from lack of maintenance. We could not ascertain about this.

E. HOSPITAL SECTOR

- a) There is a main hospital in Conakry (Hôpital de DONKA 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.
- 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

Several maintenance and repair facilities in this sector are unsatisfactory, such as maintenance-programmes, condition of machine-tools, availability of spare parts and qualification of personnel. As a result of this situation, most rolling stock is standing idle : 9 locomotives out of 16 (supplied in 1962) and 35 buses out of 50 (supplied in 1964/65).

2°) Mining Sector

The only workshop surveyed in this sector, viz. the Mining Department vehicles maintenance and repair shop, has its activity severely curtailed, because of absence of spare parts and equipment out of working order. Most vehicles belonging to this Department are at a standstill.

3°) Manufacturing Industries Sector

In this sector, only one concern, USINES MILITAIRES, started in 1967, has adequate maintenance and repair facilities thanks to substantial technical assistance from abroad.

As for the other concerns, the inadequacy lies either in the shortage of spare parts, in the bad condition of the equipment, in the underqualification of the personnel, in the weak maintenance programme or in the simultaneity of those factors, of which the former has the greatest impact.

Consequently, part of production is lost due to idleness of production-plant, and working costs are increased (f.i. : Excavator idle at Cobaya brickworks for want of spare parts; work is done by hired one).

4°) Agricultural Sector

This sector enjoys substantial maintenance assistance from the equipment supplying firms, both in spare parts provision and in expert-advice on the field. Parts are reordered at regular intervals.

5°) Hospital Sector

This sector is nearly without any repair and maintenance facilities and many items, such as X-ray apparatus and lifts, are standing idle.

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.

The most difficult situations arise :

- in the rail and road transport sector, because of the size of the shops and the extent of the assistance to call for
- in the textile industry, where many production items are standing idle stripped of many essential parts
- in the hospital sector, because of the absence of any maintenance facilities and the inability of equipment (X-ray apparatus) to withstand local atmospheric conditions.

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

Only a few shops (Railway Company, Civil Engineering Department, Bus Transport Company), were originally set to carry out overhaul of explosion motors and they have the equipment to do so. But this equipment is in bad condition and other facilities to do the work properly are missing, such as spare parts and qualified personnel.

C. FACTORS AFFECTING THE STANDARD OF EQUIPMENT MAINTENANCE AND REPAIR

These factors are :

- 1°) the shortage of original spare parts
(Remark : Spare part consumption is extremely high because of undue wear in all equipment as a result of faulty workmanship in operating and setting, and of the particular damp atmosphere of Conakry)
- 2°) the underqualification of the personnel (both maintenance and production personnel)
- 3°) the lack of facilities to produce spare parts owing to the bad condition of the machine-tools, the shortness of tools and raw materials, the absence of instruction sheets and drawings.

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

Owing to the many inadequacies in the existing repair and maintenance facilities in Guinea, it is obvious that standardization of equipment should be encouraged whenever possible. But, because of the various origins of the technical assistances operating in this country, supplied plant and equipment differ in make and design from one another.

The Transport by bus Company(5 different marks) and the agricultural Sector (7 different countries of origin for the tractors), are the most affected, as far as main production

equipment is concerned. In other industries, the number of same production items being small, the absence of standardization is not so much felt.

As for small equipment (electric motors and switchgear, pipes, valves, fats and oils, etc) present in all industries, the lack of their standardization gives rise to extra maintenance and repair problems.

E. AVAILABILITY OF PUBLIC OR PRIVATE CONCERNS DEALING WITH MAINTENANCE AND REPAIR

In Guinea, there are no public or private concerns attending exclusively to industrial equipment maintenance or repair, neither for the manufacture of spare parts, nor for any performance in this field.

Exceptionnally and on special request, SOMOVA carries out small repair and maintenance on vehicles of their mark but this is only an activity of minor importance for this Company.

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 by the local authorities.

We were informed by Government services of the setting up of a central organization to deal with this problem, but we were not able to obtain further particulars.

VI. PERSONNEL

A. AVAILABILITY OF QUALIFIED EQUIPMENT MAINTENANCE AND REPAIR PERSONNEL

All industries visited have personnel capable to carry out maintenance work but their skill is far from being perfect. Staff has had basic training in foreign industries abroad but mostly outside the scope of maintenance and repair. Their own country having many inadequacies in maintenance and repair, cannot offer sufficient opportunities to follow up this training in a satisfactory way and to direct it to maintenance and repair. Therefore, in this field, it can be said that Guinean staff lacks experience and this is an important factor which explains why all industries in this country depend so much on foreign technical assistance.

Labour has also had technical training, either in local schools or in the workshops. But they have not yet the all-round qualification needed for specialized jobs such as delicate settings, rectifying work, search for electrical and mechanical failure, their skill permitting only to deal with simple and repetitive tasks.

It must be noted that Guinean Industry, except for the Railway Company and some Mining Industries, is still very young and so is the experience of the personnel.

When so possible, we have given in the annexes the number of personnel dealing with maintenance and repair work.

B. TRAINING FACILITIES

1. Schools

There is one Technical college in Conakry. We had not the possibility to visit it.

There are also technical and professional schools. We do not know about any existing course on repair and maintenance of industrial equipment ; most probably there is none.

2. Industries

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

3. I.L.O.

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

-
- (*) - Guinean Railways
- Complexe textile de SANOYA
- Usines militaires (Military Factories).

VII. FUTURE POLICY

A. MAINTENANCE AND REPAIR REQUIREMENTS AND DETERMINING OF PRIORITIES

It results from the foregoing that 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.

The most important needs are :

- spare parts
- qualified personnel and training facilities
- equipment (machine-tools, tools)
- raw materials for spare parts manufacture
- good maintenance programmes.

It is likewise difficult to determine priorities among the various industries, maintenance and repair problems arising 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°) Short-term

a) 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 organizing 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 standardizing of equipment
- the availability of technical literature, catalogues, etc
- the information to concerns in the field of equipment maintenance and repair, dealing with various subjects such as : organization of a maintenance service, maintenance programmes, spare parts provisionning and storage, standardization, special maintenance techniques, etc.
- the assistance to the services concerned when buying new equipment, in the matter of maintenance, spares and standardization.

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

1. 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 draughtsmen.

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

2. 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.

3. Supply of technical literature

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

4. Provision of spare parts

The grant of funds in foreign currency being immediately available to the above mentioned experts at their demand and intended for the provision of spare

parts, both for production plant as for maintenance equipment and for the provision of tools (grinding wheels, drills, cutters, etc) for machine-tools.

b) 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 :

1. The provision of the services of experts and consultants

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 also comprise the preparation of a repair programme for the tractive stock and the inspection of the special tools to make sure about their condition and completeness.

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

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.

2. The grant of funds in foreign currency being immediately available to the abovementioned experts at their demand and intended to purchase spare parts for both abovementioned Companies.

2°) Long-term

a) The drawing up of a training programme including :

1. the grant of 6 refresher course scholarships in the field of maintenance and repair (as detailed par. E hereafter)
2. an action with the I.L.O. (as detailed par. E hereafter)

b) The provision of raw materials for spare parts manufacture.

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

1°) Short-term

Assistance to hospitals

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. Funds in foreign currency must be immediately available to the abovementioned experts at their demand and be intended to purchase spare parts.

Setting up of a Central Workshop

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 for the manufacture of general mechanical spare parts, of simple design and high consumption, and also of castings and even forged parts.

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 and 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, such as 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.

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

Half of the surveyed industries are without spare parts for their equipment and therefore do not care to organize stores. However, in view of the future provisionment of spare parts, the reorganization of stores is part of the action to be taken by the Advisory Department (see under B.1°).

As for the other industries, organized stores exist but could be improved by increasing the number of racks, numbering the parts and by using stock cards.

It is further recommended to set 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

1°) Refresher Course Scholarships (see also B. 2° a. 1.)

Training of personnel can only be contemplated as part of a long-term assistance programme.

As noted in the foregoing, the factors having a detrimental influence on the standard of equipment maintenance and repair is the lack of qualification on the part of personnel.

In addition to the action taken by I.L.O. (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 in the maintenance of textile machines (2 scholarships), explosion motors (2 scholarships), hospital communal equipment (1 scholarship) and tool-machines (1 scholarship). These scholarships are to be granted to staff having already some experience in repair and maintenance, able to compare what is instructed to what exists in similar concerns in their country.

We further recommend that the training should include instructions on maintenance and repair of equipment having

several years of service, as well as to special repair techniques such as recharging by welding and metallization.

Back in their country, this staff would be valuable in the relationship between the concerns and the Advisory Department.

2°) I.L.O.

Action should be taken with I.L.O. to include in their teaching programmes, a special course on industrial equipment maintenance and repair.

This course should comprise such subjects as :

- maintenance programmes drawing up and their application
- maintenance cost price estimates
- maintenance techniques, namely :
 - . search for electrical failure
 - . electric motor rewinding
 - . general mechanics (play setting, roller bearing, part adjusting, clamping, etc)
 - . explosion motors and compressors maintenance and repair
 - . welding and its application to repair of mechanical parts
 - . materials specifications (steels, cast iron, bronze, etc)
 - . lubrication (care for cleanliness and dustfree techniques)
 - . tools.

7. THE PART INDUSTRIALIZED COUNTRIES AND PARENT COMPANIES COULD POSSIBLY PLAY

In Guinea, industrialized countries and parent companies are already playing an important part. Indeed, nearly all concerns surveyed have had or still have the benefit of technical aid contributed by industrialized countries. Such aid, in

cases where it has been discontinued (in particular the Guinean Railways and T.U.C.), could usefully be resumed and, in all cases, more specially directed to maintenance problems.

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 and credits according to a schedule to be worked out at the end of the initial stage of the assistance programme.

TABLE 1 SUGGESTED ASSISTANCE PROGRAMMES SCHEDULE AND PRIORITIES

Assistance	Phase I												Phase II											
	1st year						2nd year						3rd year											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	1	2	3	4	5	6
1. <u>Formation of Maintenance Research Office</u>																								
- Experts																								
- Office Equipment and Vehicles																								
- Technical literature																								
- Grant of funds for spares																								
- Supply of raw materials																								
- Supply of equipment for spare part manufacturing shop																								
2. <u>Maintenance training scholarship</u>																								
3a) <u>Assistance to railways</u>																								
- Experts																								
- Consultants																								
- Grant of funds for spares																								
b) <u>Assistance to public transport (T.U.C.)</u>																								
- Experts																								
- Grant																								
4. <u>Assistance to hospitals</u>																								
- Expert																								
- Grant of funds for spares																								

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 Equipment to maintain
- 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 standardization on equipment maintenance and repair
- C4 Proposed remedies.

- 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 ALSTHOM 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, having several sections each with responsible head
- B2 Mileage-wise maintenance and overhaul schedule (not ascertained in its application)
- 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.
Remark : Several shop-machines out of order for lack of essential parts.

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, lathetruded, 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 ALSTHOM).
- 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 (see C2)

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 : In general, bad condition and no parts for their repair.

Staff underqualifications : good workmen and foremen with experience unavailable

Managerial staff is young, foreign trained, but still lacking in experience (f.i. most shopwork not carried out according to standard technical practice)

C3 Minor (all locomotives are of same design)

C4 Supply of missing spare parts both for locomotives and for shop-machines

Special technical assistance at managerial staff level.

- A0 ATELIERS DES PONTS ET CHAUSSEES (Highways and Civil Engineering Department)
- A1 Not obtained
- A2 Road equipment maintenance and repair
- A3 After reorganization : 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 Reorganization 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.
- B2 Actually no programme but reconstruction 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).
- B3 Shop I : divided into mechanical shop (lathe, drilling machine, shaping machine), overhaul of assemblies (rear axles, gear boxes), electrical workshop, tyre servicing shop (vulcanizing), 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, no stores. The setting up of a spare part service is planned.
- B5 Upgrading labor in progress. The assistance project provides for training directed to specialized jobs.

- 01 Inadequate (see 02)
- 02
 - Underqualification of personnel
 - Lack of spare parts
 - Shopmachines too few in number. A small number of new machines are waiting to be received. Amount of work has gone up as a result of heavy-duty use of equipment.
- 03 Important, due to equipment disparity. Standardization is aimed by assistance project.
- 04 Technical assistance in progress, should be maintained.

- A0** SOCIETE DES TRANSPORTS URBAINS DE CONAKRY (T.U.C.)
- A1** Not obtained
- A2** Passenger transport by bus in Conakry
- A3** For a fleet of 50 buses
- A4** Practically inactive
- A5** We could not estimate this
- A6** Buses of different makes
20 INTERNATIONALS (in 1966), 9 MACKS (in 1964),
8 FORDS, 5 IKARUS (1959), a few GMC's (1965)
- A7** 60 items including staff
- A8** State owned.
- B1** Several sections, each with a responsible leader under the management of a Chief Engineer
- B2** No 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, no organized store
- B5** Several members of managerial staff trained abroad.

APPENDIX 3 (flvs)

- C 1 Inadequate (see C2)
- C2 Shortage of spares, bad condition of equipment.
As the shops were inactive, we were not able to assess
labour standards.
- C3 Important, as there are several different makes
- C4 Technical assistance for the entire reorganization of
these shops (see VII. B. 1°)

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

- 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 50 items (est.)
- A4 A few items
- A5 Could not be assessed
- A6 A few Mining Department Vehicles (cars, jeeps) and vehicles
belonging to the USSR geological prospecting service (list
not obtained)
- A7 40 workmen (est.)
- A8 State owned
- B1 We have only met a shop Chief-Engineer
- B2 No programme, shop practically inactive
- B3 General mechanical and engine overhaul shops with a small
number of machine-tools (lathes, shaping machine, cylinder-
block boring machine crankshaft grinding machine), most of
them in bad condition
- B4 No spares, no well organized store. From time to time,
some supplies through USSR geological prospecting service,
but for their own equipment only.
- B5 See A7.
- C1 Inadequate (see C2)
- C2 - Absence of spare parts
- Bad condition of shop machines
- Subqualification of personnel (could not be ascertained
as shops are idle)
- C3 Not applicable in present condition
- C4 Shops to be reorganized completely, large supply of spare
parts to be provided.

APPENDIX 5

- A0 FRUITAGUINÉE
A1 1951
- 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 small in size but actually only item in this field
A6 Bottle rinsing-out and disinfecting machine, 4 filling and capping semi-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. Lubricating and repair work as required
B3 No maintenance equipment
B4 No spares, no organized stores. One production machine has been scrapped in order to take necessary parts therefrom. Supplies sometimes obtained by air.
B5 No qualified maintenance labor. Maintenance work carried out by manager himself with some aids.
- C1 Inadequate (see C2)
C2 Absence of spares, maintenance personnel, programme and stores
C3 Small, equipment all alike
C4 Reinstore stock of spare parts.
Set up maintenance service with responsible head.

- A0 COMPLEXE TEXTILE DE SANOYA
- A1 1965
- A2 Cotton spinning mill, weaving mill and printing
- A3 22 million meters 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 bobbin 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 but attempts to establish one. Gang of mechanics supervised by head of production
- B2 Daily lubricating of machines by operator. End-of-week check by the gang of mechanics.
- B3 Setting up of mechanical shop with machine tools coming from the former "LA MINIERE" Company. Several of these machines need repair ; many essential spare parts are 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).
Also missing : rewinding wire (essential for 2,000 motors in operation), insulating material, cables, 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.
Existing stores, parts not too well stored.

APPENDIX 6 (flwg)

- 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
- 01 Inadequate (see 02)
- 02
- Shortage of spare parts
 - Equipment (shops poorly fitted out) (broken machines, essential parts are missing)
 - Absence of independent service with responsible head
 - Labour underqualified
- 03 Small, equipment being of same origin
- 04
- Spare parts supply
 - Setting up of independent maintenance and repair service with program, personnel and 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 SANDT pinking machines, SINGER or PFAFF sewing machines (about 20), shaping and glue-ing machines
- A7 100
- A8 State owned
- B1 No independent maintenance service, but one person in each section responsible for production equipment maintenance. 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 maintenance programme. Maintenance-work is supervised by specialist delegated by the suppliers (trains also the corresponding Guinean staff)
- B3 Small sectional shop with machines suited to the type of manufacturing equipment.
- Central Shop including 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 : vulcanizing 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 available. Stock movement cards parts not numbered
Use occasionally parts made of salvaged equipment as a source of raw materials

APPENDIX 7 (flwg)

- B5 See B1. Personnel locally trained, in particular by machine-tool specialists. Combined theoretical tuition and practical training.

- 01 Adequate. Substantial foreign technical assistance.
- 02 Labour subqualification
- 03 Small, most equipment is of same type and design
- 04 Training of labour to be continued.

APPENDIX 8

- A0 CONFECTION VETEMENTS - USINES MILITAIRES DE CONAKRY
U.M.C.
- A1 1966 (R.F.A. technical assistance still being provided on the spot)
- A2 Clothes manufacture
- A3 163,000 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 K 305 sewing machines fitted with 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 Same as App. 7
- B5 See B1. Same as App. 7
- C1 (
- C2
- C3 Same as App. 7
- C4)

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, slitting 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 (
-
- C1 Same as App. 7
- C2
- C3
- C4

- 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. Presumable 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
Foreign Assistance (Republic of China)
- A8** State owned
- B1** Independent service with responsible head. Sectional gang of mechanics
- B2** Standard maintenance programme
- B3** Shop fitted out with : 3 lathes, 1 shaping machine, 3 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. Stores well kept but have too little space. (Parts are numbered with stock and order progress cards kept up to date.)
- B5** Information on number of labour not obtained. Is trained on site by technical assistance-experts.

APPENDIX 10 (fms)

- C1 Slight deficiency in workmanship causing machine failure and loss of production
- C2 Unqualified workmanship in correct maintenance and setting of the production plant (cigarettes manufacturing machines)
Lack of cutting tools for shopmachines
- C3 Small, machines are of the same origin
- C4 Training of personnel to be continued
Supply cutting tool
Stores to be enlarged.

- 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 but especially : shortage of raw materials, condition of production plant)
- A5 Only mechanized joiner's shop in the country
- A6 Joinery plant (MAXIMO-IMPEX make) (Yugoslavia)
(planers, surfacers, band saw, etc, all equipped with chip and dust aspirators)
- A7 200 people, including 1 manager, 20 foremen, 25 clerks
(Foreign assistance : 3 experts : boiler room, bookkeeping, drawing office, but none for maintenance)
- A8 State owned
- B1 Independent maintenance service
- B2 No maintenance programme. Work according to urgent needs
- 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 One foreman and 6 workmen
- C1 Inadequate (see C2)
- C2 Shortage of spares.
Substandard qualifications of personnel, staff and foremen
Absence of maintenance programme
- C3 Small, all machines are of the same origin
- C4 Supply of various spare parts and cutting-tools
Training of personnel to be undertaken.

- A0** INSTALLATIONS FRIGORIFIQUES DU PORT MARITIME (CONAKRY)
(Seaport Refrigerating Plant)
- A1** 1963
- A2** Foodstuffs preservation and ice production
- A3** Cold store capacity : 559 sq.m. or 150 t of fish and
150 t of sundry products. Ice : 15 t per day
- A4** Daily ice production fallen to 7 t due to bad condition
of cooling water pipework (sea water = corrosion)
- A5** Only refrigerating plant in Guinea
- A6** 5 ammonia 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 recent USSR technical
assistance (3 technicians+1 interpreter)
- B2** Normal maintenance according to programme (lubricating,
checking, overhaul).
The absence of reserve production plant (especially ice
production) does not 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. (Parts not numbered,
untidiness)
- B5** 5 Guinean technicians are locally in training under the
technical assistance scheme. Manager is a refrigerating
engineer trained in USSR.
- C1** Adequate
- C2** Use of seawater for refrigeration. (This corrosion problem
not yet solved technically, is now under consideration at
the University of Moscou)
Subqualification of personnel
Absence of reserve production plant (standby)

APPENDIX 12 (fmr)

- 03 None (only one type of compressor, same supplier)
- 04 Use of materials resistant to sea-water corrosion
Training of personnel to be continued
Improve storage of spare parts.

- A0 SOMOVA (SOCIETE DE MONTAGE DE VEHICULES AUTOMOBILES)
- A1 1965
- A2 Assembling of lorries (of American make)
Maintenance of lorries (occasionally and for own mark only).
The company plans 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.
- 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.
- A7 190 workmen. European Manager
No special experience is required on being taken on (only C.A.P. = certificat aptitude professionnelle)
(Occupational Proficiency Certificate), local training, further training abroad (7 at present in U.S.A.), e.g. injection pump adjusting specialist.
- A8 Mixed company. Guinean State 51 %; private 49 %.

B and C : Does not apply (assembly shop)

Remark : The shop has no spare parts for maintenance work : those are ordered from the maker practically one by one as needed.

- A0 BRIQUETERIE DE COBAYA
- A1 1964
- A2 Bricks and tiles
- A3 7,2 million bricks p.a., 8,4 million tiles p.a.
- A4 100 % for bricks. No tile production (quality of clay unfit - porous tiles)
- A5 Only brick works. Country needs 12 million bricks p.a.
- A6 WESERHUTTE 15 cu.m/hr excavator
2 24 HP 1965 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 (Yugoslavian assistance)
- A8 State owned
- B1 Independent service, with responsible foreman
- B2 Ordinary maintenance programme
- 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). Stores untidy, parts not numbered
- B5 Suitable labour ; locally trained
- C1 Adequate. Some plant occasionally in difficulty because of spares (Ex. excavator standing idle, waiting for parts)
- C2 None
Note : Due to no tile production, workshop has two each of part of the items of equipment, which facilitates maintenance.
- C3 Small (no large series of same items in production equipment)
- C4 Increase stock of spares
Improve stores

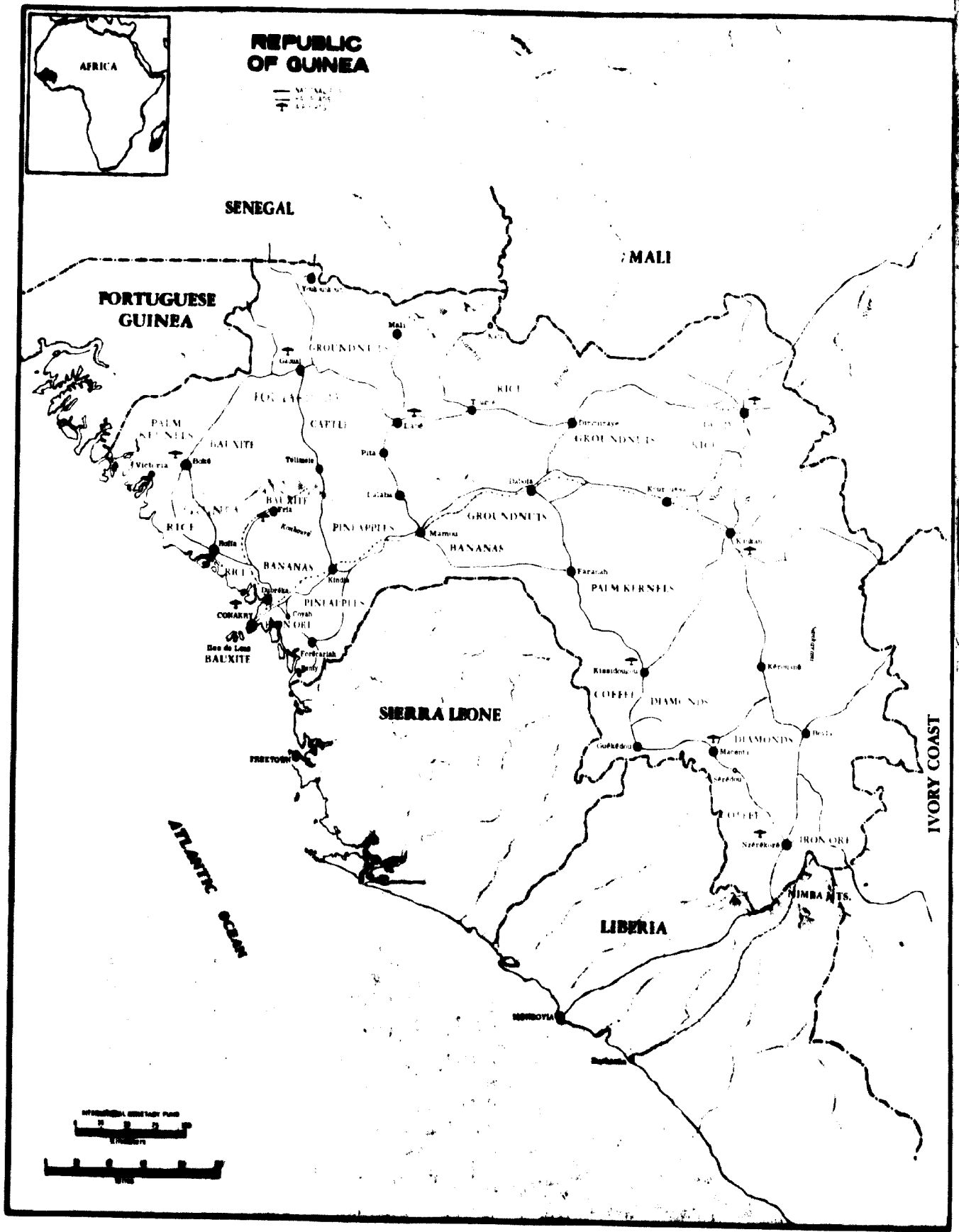
- A0 AGRIMA (SOCIETE D'IMPORTATION DE MATERIEL AGRICOLE)
- A1 Subsequent to establishment of Home Rule
- A2 Importation and distribution of equipment and materials for agriculture, such as : machines, equipment, seeds, fertilizers, etc
- A3/A4 1,268 tractors imported since 1960, half of which imported in 1967. Before 1960, the number was 70.
- A5 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 (no production)
- A8 State owned
- B1 Maintenance centres with responsible head 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.
 Note : The efficient running of the centre depends on the measure of ability of the person in charge.
- 01 Seems adequate
- 02 Lack of standardization : variety of equipment
- 03 Considerable, as equipment is very diverse in origin
- 04 Standardization whenever possible
- Remark : The information given above results from talks we had with the manager of AGRIMA. We could not visit any of the centres and therefore could not see for ourselves the standard of maintenance really produced.

- A0 HOPITAL DE DONKA (CONAKRY)
- A1 1957
- A2 Hospital with operating rooms and various therapeutic treatment installations (rays)
- A3 500 beds
- A4 100 %
- 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, such as : communal installations (kitchen, wash-house), sterilizing rooms, X-ray apparatus, encephalograph, electro-cardiograph, operating units, boiler room (1957 and 1964 10 kg/sq.cm BOUTILLAT boilers), OTIS lifts (1959).
- 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 : boilers 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.
- 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

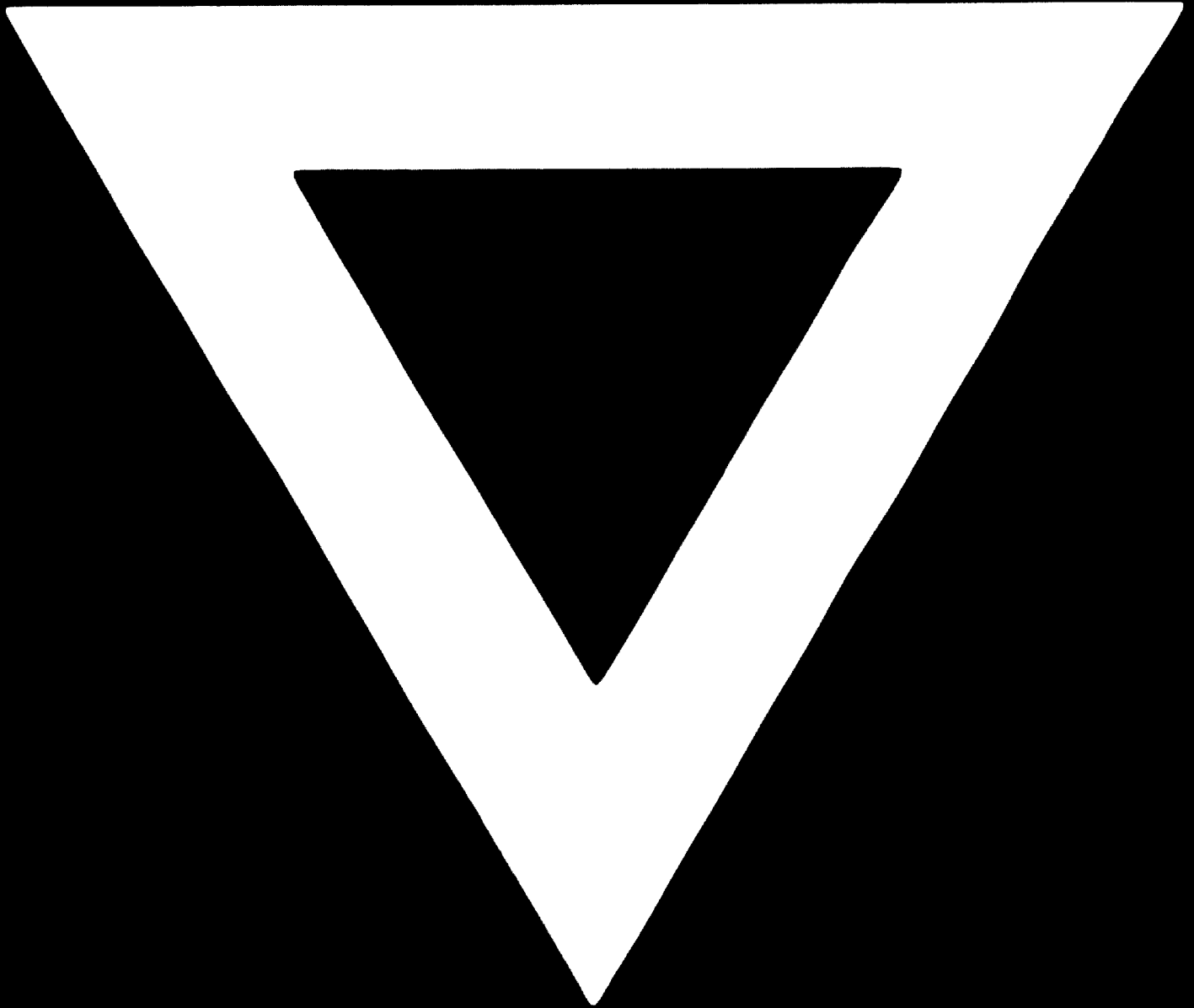
- B4 Practically no spares
- B5 A few maintenance hands under the control of a Guinean foreman
Czechoslovakian technician, assisting for radiology equipment maintenance. Unable to set it to work.

- 01 Unadequate
- 02 Lack of plant maintenance personnel
Absence of spare parts
Unsuitability of X-ray equipment (does not withstand local atmospheric conditions)
- 03 Small
- 04 Technical assistance in view of very serious inadequacy.

Note : It is also necessary to complete the building, unfinished when Home Rule was established and left so since.



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