

CH



United Nations
Economic Commission for Africa

ECA/MRAG/96/53/MR



Multidisciplinary
Regional Advisory Group

ADVISORY REPORT ON THE ESTABLISHMENT
OF A NATIONAL MAINTENANCE PROGRAMME
OF ELECTRONICS EQUIPMENT IN MALI

By:

EDWARD A. TIAGHA,
REGIONAL ADVISER ON INDUSTRY AND
TECHNOLOGY DEVELOPMENT, NRD

ECA
621.38(662)
A2445
c. 2

ECA/MRAG/96/53/MR

**UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA
MULTIDISCIPLINARY REGIONAL ADVISORY GROUP**

**ADVISORY REPORT ON THE ESTABLISHMENT OF
A NATIONAL MAINTENANCE PROGRAMME
OF ELECTRONICS EQUIPMENT IN MALI.**

**EDWARD A. TIAGHA
REGIONAL ADVISER, INDUSTRY AND TECHNOLOGY DEVELOPMENT**

**ADDIS ABABA
JULY 29, 1996**

	TABLE OF CONTENTS	PAGE
I.	INTRODUCTION: THE PROBLEMATIC OF MAINTENANCE IN AFRICA.	1
	1.1 Overview	1
II.	TERMS OF REFERENCE	2
III.	MEETINGS WITH SOME SELECT ENTERPRISES	4
IV.	MISSION FINDINGS	6
V.	CONCLUSIONS AN RECOMMENDATIONS	7
	5.1 Conclusions	7
	5.2 Recommendations	7
	A. Short Term	7
	B. Medium Term	8
	C. Long Term	8
VI.	LIST OF PERSONS SEEN	10

I. INTRODUCTION: THE PROBLEMATIC OF MAINTENANCE IN AFRICA.

1.1. Overview

1. Maintenance of equipment is a subset and a major component of the regeneration and rehabilitation of existing industrial establishments in Africa, one of the principal goals of the programme of the Second Industrial Development Decade (Second IDDA). It is clear however, that the problematic of maintenance has not been given the pride of place in most African countries' industrialization programme. This largely explains the carcasses of all types of equipment strewn across the continent's engineering outfits including factories, university laboratories, airports etc. Most importantly, this explains the dismal performance of African industries in terms of full capacity utilization, productivity, cost effectiveness and profitability.¹

2. Yet, countless seminars and a lot of money has been spent on maintenance programmes training that has been targeted at technicians, engineering and managers on all kinds of equipment, especially electronics equipment. These seminars have not to a large extent yielded the desired results, ie. induced the industrial sector of member countries to adopt a stringent maintenance programme.

3. In the face of the impending application of the demanding requirements of the Uruguay Round Agreements, it is time that African countries revisit their maintenance and rehabilitation strategies, if they want to provide a fighting chance to their yet underdeveloped industrial structures.

4. Several factors have attributed to this lack of a maintenance culture in Africa, some of which are:

a. The constant flow of unscrupulous salesmen, usually from former colonial countries, but which more and more, include those from Newly Industrialized Countries, peddling "newer and better performing models or versions" of existing equipment that they (the sales men) claim can do a better job than existing equipment with the claim that newer equipment will thus render Africa more competitive in the world markets.

b. New equipment are most often bought without the implication of the team that will maintain them. It is usually after the limited warrantee (generally six months to a year) has elapsed and the equipment falls into

¹ For a more comprehensive discussion on the problem of maintenance in Africa see the ECA publication: "ETUDE SUR LE DEVELOPPEMENT DES SERVICES DE REPARATION ET D'ENTRETIEN INDUSTRIELS EN AFRIQUE". Reference ECA/IHSD/IPPIS/002/94/Rev.1, October 1995. Several copies of this document was given to the Director of Tourism in Mali for dissemination

disrepair that the organization starts looking for someone to repair the equipment. In most cases, the original seller has left the country and there is no one locally, to turn to. The next step is to resort to the parent companies overseas for needed assistance. This assistance of course comes with the cost of down time of the equipment, and the cost of an outside expert, masquerading as a knight in shining armour, coming to the rescue of an African enterprise, further fuelling the mis-conceptions of ignorant and incompetent local technical force.

c. The inexplicable need for newly appointed managers to "put their stamp" on organizational matters by buying new and sophisticated equipment that no sooner fall into disrepair due to inadequate maintenance planning. The destiny of Africa cannot be left in the hands of economists alone!

d. The unwillingness on the part of management, especially the financial ones, to heed the advice of maintenance technicians and engineers to establish workable maintenance programmes they have learnt from maintenance workshops and seminars. This unwillingness is generally due to lack of full knowledge of the importance of the maintenance function on the part of the non-technical managers whose primary aim is to show short term profits to stockholders and by so doing ingratiate themselves, and retaining their jobs.

e. Out-right greed and mismanagement of funds has incapacitated the maintenance service by the illegal misuse of the funds allotted for this service.

5. The implicit message given to the maintenance team is that theirs is a function that can be dispensed of when there is a budget crunch in the organization. This lack of seriousness of purpose does not instill confidence, pride and worse still job security. Hence the maintenance crew invariably seeks to move to more secure white collar jobs that are often seen as more prestigious in the organization because of the relatively higher salaries they command. What is clear though is that:

a. It costs much less to maintain and rehabilitate existing equipment than to purchase new equipment.

b. Maintaining equipment offers an opportunity for local technicians and engineers to acquire technological skills, a necessary process for the mastery of technology. If one masters the maintenance of a particular model of equipment, it becomes that much easier to master the repair of a newer model.

c. Maintained equipment lead to higher productivity for the firms,

because the down-time of industrial operations is minimized, and capacity utilization is increased.

II. TERMS OF REFERENCE

6. The original request from the Malian Government to the Economic Commission for Africa requested the Commission to, amongst other activities, organize a seminar for the training of technicians to maintain electronics equipment in touristic installations in Mali. Not being fully aware of the type of touristic installations and the type of electronics equipment in Mali, this mission was undertaken as a needs assessment mission with a view to discussing with the Malian authorities and proposing a comprehensive solution, on the maintenance of electronics equipment at touristic establishments.

7. The meeting with Mr. Harouna Niang Secretary General of the Ministry of Industry, Artisans and Tourism, and Mr. Guisse D. Aguibou, Commissioner of Tourism, helped to clarify the terms of reference of the mission. Essentially the Secretary General at the Ministry of Industry, Artisans and tourism outlined the terms of reference as follows:

a. The problem of maintenance in Mali needed to be addressed in a coherent manner. The recent breakdown of an elevator in a major hotel in Bamako during an international meeting re-emphasized the importance of a maintenance programme in the country. He requested that the Economic Commission for Africa assist the country by addressing the problem in a comprehensive manner.

b. The office of Tourism was planning to open offices in various parts of the country and it was important to ensure that the equipment at the touristic sites were well taken care of and did not fall into disrepair.

c. The ministry was considering the role of the private sector in carrying out some of these activities. Serious considerations were being made to send technicians to other countries for further training.

d. The Government of Mali has decided to liberalize the information technology especially the internet and several organizations have been interested in setting up the internet system. These include: SOTELMA (The telecommunication authority of Mali), USAID (United States Agency for International Development), CIT (Centre d'Information Technique), an affiliate of CAPES, and ORSTOM.

e. The General Secretary also indicated that the Ministry was intending to organize a private sector forum in late October early November. A request was extended to UNECA to participate and to assist in the

organization by indicating organizations that could attend with a view to bringing more insights into the problem. The wish was expressed to extend invitation to the African Business Round Table. The aim of the forum is to provide publicity for the Malian Government and attract potential investors to the country. This, forum is in line with the Gaborone Declaration elaborate at the Twelfth Meeting of the Conference of African Ministers of Industry that took place in Gaborone, Botswana in 1995.

III. MEETINGS WITH SOME SELECTED ENTERPRISES

8. The meeting with Mr. Djibril B. Taboure, Director of the Travel Agency "Afric Trans Service", had as goal to observe the maintenance operations of a small scale touristic enterprise that utilizes relatively high technology for its operations. With five telephone lines, one dedicated to a facsimile and a direct line for the director, three lines for common use through a switch board, electronics communication is maintained.

9. The company has several computers for routine office work and a pentium for accounting purposes. Maintenance is essentially undertaken at an informal level whereby a technician is called from time to time as need arises to undertake maintenance problems. Management finds this arrangement very convenient and cost effective. There are a couple of voltage regulators and power supply backup that can service the machines for an hour after electricity shut down. The software used for airline bookings using the UNISYT system is supplied and maintained by Air Afrique.

10. Communication is an important factor in the travel business and currently the company uses primarily fax machine to communicate with the outside world. There is an effort to utilize the e-mail for communication, but this tool is not yet very widely used because of the cost. The cost benefit analysis has not been undertaken to determine if the E-mail will cost less than the fax.

11. The Director General of CAPES (Centre d'Assistance aux Projets, Entreprise, et Socete), Mr. Mohamed Simpara, who was accompanied by a number of his staff Mr. Dialguily Sarambounnou, and Mr. Cheick Abiba Sangare, provided an overview of the mission of the organization as follows:

- Promotion of investments
- Provision of engineering service to projects and feasibility studies;
- Provision of management services to enterprises;
- Provision of services for training in management services.

12. Created in 1991 CAPES also provides services in the following areas: with the assistance of a data bank, it provides project ideas economic statistics etc. With the assistance of the Centre d'Informatique et Technologique, about five to six economic operators a day request the services of the CIT and are assisted

by a vast data bank that uses CD-ROM with data from several countries.

13. Maintenance is a major problem with CAPES given the fact that most of its computers, telephones, air conditioners and fans are in disrepair. These equipment are from various manufactures in different countries and thus it is very difficult to find spare parts or competent technicians to carry out the maintenance of the equipment.

14. After a brainstorming session, it was decided that CAPES should explore ways and means of incorporating a training programme on the maintenance of electronics equipment into its training. Perhaps some qualified professors from the engineering school in Mali could serve as trainers of this course with a special consideration extended to them for remuneration as a motivation package.

15. The visit to ORSTOM provided an opportunity to see a potential Internet server for Mali. This institute that does research in several areas has the need to exchange information with its several branches in Africa. The Internet has been selected as a way of diffusing this information. Several high powered computers have been put in place to serve as the Internet SERVER. There are about ninety users in all of Mali currently using the system. ORSTOM plans to limit the number because of system overload and possible breakdowns. Maintenance is not yet a problem because the chosen system is robust and there are enough precautions taken to ensure that there are no breakdowns. Any breakdowns however are sent to France for repairs.

16. A potential use of the internet system at ORSTOM is a data base on the touristic information of Mali that has been furnished by the Office of the Commissioner of Tourism. It is envisioned that in a few months, the information will be available to must tourists by way of the internet.

17. Hotel d'Amitie provided an opportunity to visit an enterprise that has several maintenance problems. This hotel is a chain of the world famous Sofitel. Its major problem is that the equipment is very old and has not been replaced since the hotel opened in 1969. There is one technician who takes care of the telephone repair, one for minor repairs of the elevator. Major repairs are subcontracted to outside firms that come on a needs basis. The major problem is that the electrical system, air conditioning system are working at a dangerously state of repairs. There is only one machine for laundry and if this breaks down there will be no laundry done at the hotel. The emergency power generator is extremely old and needs repairs.

18. The maintenance problem at the hotel presented a classic case of the problem of maintenance in Africa. There is a recognition on the part of management of the magnitude of the problem and there are attempts to maintain the level of maintenance at the present level, while waiting for a comprehensive report and recommendations from a study carried out recently by the parent company, Sofitel. Also, the fact that the hotel will be soon privatized has brought all attempts for implementing a coherent maintenance problem to a halt. It is hoped

that when privatized, the hotel will be able to renew its electronics systems, laundry system and standby generator system. Meanwhile, the hotel electrical and electronics system is working on borrowed time, because of the bad state of repairs.

19. The national telecommunication system SOTELMA for Socete de Telecommunication du Mali is working very hard to provide an internet system to the users in Mali. In 1992, a pilot network for data transmission was put in place in Mali. Recent attempts are being made to put in place an internet system in Mali. There are two nodes in Mali one in Bamako and outside of the capital city. The USAID has been chosen to provide the server for internet based on an attractive cost basis and other countries are in the running for more servers.

20. It is expected that maintenance arrangements will be made with these countries to train the technicians to maintain these equipment. Already spare parts, documentation etc. are being requested as part of the acquisition process.

21. The policy Reform for Economic Development Company is one of several companies that is preparing to participate in the Internet system in Mali. This company is in contact with SOTELMA with a view to utilizing its internet system once the system is functioning. As of present, the company plays a clearing house role whereby information sent to various small and medium scale enterprises is sent to the company through internet and they collect the data from the company. The company is also attempting to process information from the Tourism Ministry and put this information into a web for potential visitors to Mali.

22. This company is supported by the Swiss and Finns and it is expected that these suppliers will also assist the company to set up a maintenance company.

IV. MISSION FINDINGS

23. Mali, like many other African countries, has a serious problem of maintenance of its equipment. Unlike many other African countries however, Mali has realised the importance of working towards the institution of a coherent programme nation wide. The clearest indication of this willingness to address the maintenance problem is demonstrated by the invitation of the United Nations Economic Commission for Africa by the Ministry of Industry, Artisan and Tourism to work with the Government of Mali towards finding a solution to this problem. It is on this basis that the Regional Adviser on Industry and Technology Development Mr. Edward A. Tiagha undertook a mission o Bamako from 20 to 25 July, 1996 to study this problem.

24. The field visits undertaken by Mr. Guisse and Mr. Tiagha revealed that with the exception of ATS and to a certain extent ORSTOM, that have relatively mastered the problem of maintaining their electronics equipment, there is a severe

lack of a maintenance programme in most Malian companies. This condition is due to several classical problems associated with the maintenance function, amongst which are:

- a. An absence of a maintenance culture. Everybody talks about the problem of maintenance but no body does something about it.
- b. The inability to master the maintenance of a particular line of electronics equipment because enterprises generally have various types of equipment imposed on them by the bilateral donors from several countries, rendering the problem of specialization of maintaining a particular equipment difficult.
- c. The general absence of a maintenance budget in most organizations leading to a situation where there are no funds to buy spare parts. A piece of equipment has to fail before the part is ordered with none existent funds. Usually the original manufacturer no longer manufactures the spare parts and the part has to be machined at an exorbitant cost to the company in need.
- d. The inadequate training of a maintenance crew and inability to compensate them adequately, leading to a situation where they loose interest very quickly in their work and seek other work elsewhere. Maintenance workers are looked down upon and so they look for the more prestigious white collar jobs.

V. CONCLUSIONS AN RECOMMENDATIONS

5.1 Conclusions

25. The consensus with the persons encountered resulted in the following conclusions:

- a. Maintenance and rehabilitation of equipment for optimal functioning is a management problem. Once top management has accepted that the problem exist, solutions can be found to solve it by a comprehensive policy that allocates a budget, assures adequate documentation and ensures the continuous training of staff to maintain and rehabilitate the equipment.
- b. Training of staff is a very important part of the maintenance function. Training does not have to take place overseas because of the inherent problem of loosing trained personnel to other undeserving countries.
- c. Usually, knowing where the spares are available is a very difficult problem because companies fold up leaving the original equipment obsolete. The system of interrogating potential spare parts suppliers through the

Internet for spare parts can prove to be very useful.

5.2 Recommendations

A. Short Term

1. The Ministry of Industry, Artisans and Tourism should make an inventory of Malian private sector businesses with the view to assigning specific maintenance problems to specific businesses. For example it could be established which Malian enterprises are responsible for repairing computers, electrical machinery, telephones, etc.
2. There after, the maintenance of equipment could be delegated to the identified private sector enterprises in Mali and the role of Government should be to assist these private enterprises to undertake their mission with little interference and initial financial assistance through tax breaks and other incentives.
3. Training of maintenance technicians and engineers should be done locally. In this context, it is suggested that CAPES incorporate in its training programme the maintenance of electronics equipment. The teachers of this course could come from the engineering school - ENI in Bamako, through a special dispensation that allows the qualified teachers to be paid for the work they do at CAPES. Government is requested to consider this arrangement and make it possible for capable teachers of ENI to train Malian maintenance technicians at CAPES.

B. Medium Term

1. There should be a concerted effort to rationalized the acquisition of electronics equipment in Mali. The equipment bought or donated should be amenable to repairs, locally. A rule of thumb is not to accept donated equipment unless there is a plan to provide the training for its maintenance. What appears to be a free gift today usually turns out not to be in the interest of the country in the long run. Imagine the frustration and morale of staff after they have been introduced to new equipment only to find out that the equipment lies fallow due to lack of maintenance.
2. To re-enforce and inculcate the maintenance culture at the national in both the public and private sectors, considerations should be given to the promotion of maintenance activities in the country. The theme of a "Maintenance conscious" Mali could be part of the African Industrialization Day activities that take place in 20 November every year. Companies with the best maintenance programmes could be awarded national certificates by

the ministry of Industry, Artisan and Tourism.

C. Long Term

1. In the context of the programme of the Second Industrial Development Decade for Africa, all efforts should be made to rehabilitate and put in place a programme for the maintenance of equipment at the national level, using national institutions and national experts. In the long run such a programme helps to save money that is spent on down-time, expensive foreign experts etc.
2. The international community, especially the United Nations system, the Economic Commission for Africa, the United Nations Development Programme, the United Nations Industrial Development Organization along with the World Bank should assist the Malian Government by training its technicians through joint seminars.

VI. LIST OF PERSONS SEEN

1. Mr. Dionou Fidele, Deputy Resident Representative, UNDP Mali. B.P. 120 Bamako, Mali. Telephone: 22-38-00, 22-43-80, 22-37-23. Fax: 22-62-98.
2. Mr. Niang Harouna, General Secretary, Ministry of Industry, Artisan and tourism. P.O. Box 1759, Bamako, Mali. Phone: 223-22-21-34, 22-43-57, 22-80-58. Fax: 223-22-21-34.
3. Mr. Guisse D. Aguibou. Commissioner of Tourism. P. O. Box 191, Bamako, Mali. Phone: 22-56-73. Fax and Direct Line: 225- 22- 55- 41.
4. Taboure, Djibril, Director, Afric Trans Service, Avenue Modibo Keita. P.O. Box 2917 Bamako, Mali. Phone: 223-22-78-92, 22-44-35. Fax: 223- 22- 94-50.
5. Mr. Mohamed Simpara, President and Director General of Centre d'Assistance aux Projets, Entreprises et Socetes. B. P. 1980 Avenue Cheik Zayed, Laflabougou, Bamako, Mali. Phone: 22-22-79, 22-52-12. Fax: 22-80-85.
6. Mr. Sarambounou, Consultant, Formateur, Centre d'Assistance aux Projets, Entreprises et Socetes. B. P. 1980 Avenue Cheik Zayed, Laflabougou, Bamako, Mali. Phone: 22-22-79, 22-52-12. Fax: 22-80-85.
7. Mr. Cheik Abiba Sangare, Relation Publique, Centre d'Assistance aux Projets, Entreprises et Socetes. B. P. 1980 Avenue Cheik Zayed, Laflabougou, Bamako, Mali. Phone: 22-22-79, 22-52-12. Fax: 22-80-85.

8. Mr. Diamoutani Mamadou, B.P. 84 ORSTON, Bamako, Mali Phone: 223-22-43-05. Email: diamouta @ bamako.orstom.ml
9. Mr. Dagnoko Sidy, President Directeur General, Office des Relais Touristiques and head of Hotel d'Amitie. B.P. 2473 Bamako, Mali. Phone: 22-43-21 Fax: 22-43-85.
10. SECK a. Ousmane, engineer, SOTOLMA (Socete de Telecommunication du Mali). B. P. 1317 Bamako, Mali. Phone: 223-22-52-60 poste 216. Fax: 223-22-57-41. Email: 2021195 @mcimail.com.
11. Diabate Abubacar, Conseiller Information de Marche. B.P. 34 Bamako, Mali. Phone: 223-23-09-01. Fax: 223-22-63-04.

ECA

621.38(662)

A2445

U.N. ECA

c. 2

Advisory report on the
establishment of a nat-
ional maintenance progra-
me of electronic equip-
ment in Mali, 1996

DATE

DATE DUE