

**EVALUATION OF THE ACTIVITIES CONDUCTED  
FROM 1976 TO 1989 OF THE MATERIALS AND  
EQUIPMENT COMMITTEE OF THE UNION OF  
AFRICAN RAILWAYS (UAR)**

**KINSHASA, ZAIRE**

## **I. OBJECTIVE OF THE REPORT**

To evaluate the activities of the Materials and Equipment Committee of the Union of African Railways (UAR) in Kinshasa, Zaire during the period 1976 to 1989.

In his telex no. 455 of 5 October 1989, the Secretary-General of UAR requested ECA to authorize Mr. Antoine Tchibozo, rail transport expert of the Transport, Communications and Tourism Division, to conduct an evaluation of the activities of the Materials and Equipment Committee of the Organization.

## **II. BACKGROUND**

The Union of African Railways is a specialized agency set up by the Organization of African Unity (OAU) to develop rail transport in Africa. The Committee has five technical working committees responsible for implementing its work programme. Among these committees are the Materials and Equipment Committee, which met for the first time at the headquarters of the Railways and Ports Authority in Takoradi, Ghana from 16 to 20 February 1976. Since then, the Committee has regularly held annual meetings to make recommendations and pass resolutions which are submitted to the General Assembly, the supreme decision making organ of the Union.

The Committee has been making these recommendations for 14 years now. Once adopted by the General Assembly, they are communicated by the Secretary-General of the Union to the member networks of the UAR for implementation. The recommendations are aimed at defining modalities for executing the tasks assigned to the UAR by the Heads of State and Government in 1973, including:

- (a) Studies on ways of standardizing African railway networks;
- (b) Improvement of current railway services;
- (c) Standardization of rolling stock and related equipment;
- (d) Co-ordination of rail transport with other modes of transport.

Fifteen years after the establishment of the technical working committees, the UAR General Assembly decided that an evaluation of the activities of the committees should be conducted in order to take stock of progress made in attaining the set objectives and to define the direction that activities of the committees should take in solving the specific problems which have a bearing on the development of rail transport infrastructure and the management of railways. These committees are the focal points of the work of UAR.

### **III. METHODOLOGY**

The methodology used for the evaluation of the activities of the working committee involved:

- (a) Inventory of all resolutions and recommendations made by the Materials and Equipment Committee and those made at seminars and colloquia organized within the scope of activities of the committee and evaluation of their implementation, in other words their application by the member networks of the Union;
- (b) Impact of the implementation of these resolutions and problems encountered in that regard;
- (c) Identification of resolutions which have not been implemented and reasons for this;
- (d) Search for ways and means by the networks together with the UAR secretariat to implement the recommendations;
- (e) Recommendations and conclusions of the evaluation study.

Recommendations to be implemented by the Materials and Equipment Committee are of a technical nature, requiring the execution and follow up of specific projects.

### **IV. INVENTORY OF RECOMMENDATIONS AND RESOLUTIONS AND STATUS OF THEIR IMPLEMENTATION**

The first meeting of the Materials and Equipment Committee held in Takoradi, Ghana in 1976.

At the first meeting of the Committee, all the issues relating to the strategy to be adopted to attain the objectives set by the Union were considered, including the following:

- (a) Locomotives: Buffing and coupling gear, power of engines, track gauge (for future interconnection), type of traction (steam, electric, diesel, hydraulic), speed of trains, type of brake, bogies, possibilities for permutation of parts, criteria for selecting locomotives and their constituent parts, trailer stock (wagons and coaches), standardization of the equipment for international traffic workshops and depots, template gauge, weight of rails, type of sleepers, bridges (axle load), signalling and telecommunications equipment and establishment of supply pools.

At that meeting, some Committee members were assigned the responsibility of collecting information in the various subregions:

- Eastern Africa (Swaziland)
- West Africa (Cote d'Ivoire)
- Central Africa (the Congo)
- North Africa (the Chairman: Ghana)

It was not possible to examine the follow-up to the above assignment because the report of the second meeting held in Swaziland from 27 to 30 July 1976 was not available at the UAR secretariat.

## 2. Joint meeting on track and equipment

The joint meeting of the Track and Equipment Committees, held in Tunis, Tunisia on 30 and 31 July 1977 made the following recommendations on the basis of the deliberations of the Swaziland meeting.

- |     |            |     |   |
|-----|------------|-----|---|
| (a) | Axle load  | 15  | tonnes/axle                             |
| (b) | Structures | 20  | tonnes/axle for the standard gauge line |
| (c) | Speed      | 120 | km/hr for metric gauge lines and        |
|     |            | 160 | km/hr for the standard gauge lines      |

These recommendations were adopted by the fourth General Assembly.

### Status of implementation within the networks

The recommendations have been partly applied in the construction of new railway line and rehabilitation of existing ones. The recommendations were also adhered to by certain networks in the acquisition of equipment after 1977. However, the UAR secretariat has not received the relevant information.

3. Third meeting of the Materials and Equipment Committee

The meeting was held in Abidjan, Cote d'Ivoire from 19 to 23 July 1977. It recommended fixing the time for the periodic overhaul of international traffic trailer stock at eight years or 800,000 km, with preference for the latter. This recommendation was adopted by the fifth General Assembly organized in Cairo from 22 to 28 October 1977.

Status of implementation within the networks

Most of the networks already apply the eight year or 800,000 km criterion in the overhaul of trailer stock. The application of these recommendations will have to be enforced for international traffic after the interconnection of networks which apply different time periods for the maintenance of their equipment. A detailed list of the networks already interconnected will be drawn up when the UAR has the necessary data.

4. Fourth meeting of the Materials and Equipment Committee

This meeting was organized in Pointe-Noire, the Congo from 14 to 17 February 1978. The recommendations of the meeting were adopted by the sixth General Assembly held in Nigeria from 23 to 28 October 1978.

In addition to the adoption by the fifth General Assembly of the eight year or 800,000 km periodic overhaul scheme for trailer stock, the fourth meeting further insisted that preference should be given to the actual mileage proposal i.e. 800,000 km in order to ensure international traffic safety.

Another recommendation was adopted aimed at minimizing the dependence of African networks on the industrialized countries through the local manufacture of some spare parts such as wheels, tyres, tyre-clips and axle pins.

Status of implementation

At the current stage of the stage and on the basis of available information, only the Southern African (Zimbabwe) and North African subregions already have developed of the rail transport industry., The study on the identification of rail transport industries and workshops in Africa capable of promoting the rail transport industry in Africa took account of the survey of countries which have a railway industry. The findings of this study will indicate the status of implementation of this recommendation.

5. Fifth meeting of the Materials and Equipment Committee

This meeting was held in Kinshasa, Zaire from 13 to 16 February 1979. The recommendations of the meeting were adopted by the seventh General Assembly, held in Libreville, Gabon from 22 to 26 October 1979. The recommendations related to:

- (a) The holding of a joint meeting of the Supplies and Materials Committees;
- (b) Application of UAR standards: the need to draw up contractual conditions and technical specifications. These documents should be forwarded to the UAR secretariat for monitoring the application of the defined standards;
- (c) Planning for a UAR standard gauge;
- (d) Adoption of compressed air braking system by UAR member networks. To ensure uniformity, the UAR Secretary-General should be associated with any future conversion of breaking system;
- (e) Adoption of monoblock wheels for UAR member networks; and
- (f) Establishment of central workshops for spare part manufacture as recommended by the first UAR symposium.

Status of implementation within the networks

- (a) The joint meeting of the Supplies and Materials Committees did not take place;
- (b) Most of the contractual conditions and technical specifications prepared by the networks were not forwarded to the UAR Secretary-General for monitoring application of standards;
- (c) The proposed UAR track gauge was adopted but very few new line have been constructed. A list of the networks that have implemented this recommendation will be provided as soon as the necessary information is available. The same applies to rolling stock;

- (d) A number of networks are already using compressed air brakes for their trailer stock. Some networks have already conducted the study on the conversion of their brakes but have not switched over yet. Others have already ordered and received new rolling stock with both compressed air and vacuum brakes.

The status of implementation this recommendation will be specified for each network as information becomes available. Some networks such as RCFM (the Malian network), RCNF (the Cameroonian network), SNCZ - RO (the Zairian network), Ran (the Cote d'Ivoire - Burkina Faso network), and the Ethio-Djibouti network have partly implemented this recommendation.

Many countries have already implemented the recommendation on monoblock wheels. The situation in each network is yet to be determined.

No action has been taken yet on the establishment of central workshops.

#### 6. Sixth meeting of the Materials and Equipment Committee

The meeting was held in Lagos, Nigeria from 12 to 16 February 1980. The recommendations of the meeting were adopted by the eighth General Assembly, held in Douala, Cameroon from 27 to 31 October 1980. These include:

- (a) Adoption of specifications for covered wagons, tip-carts and flat wagons;
- (b) Adoption of specifications 3001, 3002 and 3003 defining the modalities for introducing:
- UAR coupling;
  - Standards for maintenance and repair of trailer stock;
  - Compressed air brakes.
- (c) Specifications of monoblock wheels;
- (d) Establishment in each subregion of a community wagons factory with a view to developing the rail transport industry.

Status of implementation in the networksUAR standards wagons

As the specifications requested were not forwarded to the UAR secretariat, there is no definite information on implementation of this recommendation.

UAR specifications

Same as above

Specifications of monoblock wheels

Same as above

Development of the rail transport industry

With regard to the recommendation to establish a community wagons factory in each subregion, a preliminary action has been taken in the West African subregion by conducting a study on the establishment of one such factory at Bobo Dioulasso in Burkina Faso. No action has been taken in the other subregions as yet, apart from individual efforts in some countries in Southern and North Africa. As with the other recommendations, specific information will be provided as soon as the networks indicate the status of implementation within their establishments.

7. Seventh Meeting of the Materials and Equipment Committee

This meeting was organized in Kinshasa, Zaire from 17 to 20 February 1981. The recommendation of the meeting was adopted by the ninth General Assembly held in Blantyre in 1981 and may be summed up as follows:

- (a) Each member of the Materials and Equipment Committee should report on the implementation of recommendations within its network during the Committee's meeting;
- (b) Specification 3004 relating to UAR standard wagons should be adopted.

Status of implementation

- (a) Judging from the reports presented by representatives of the various networks at meetings of the Committee, it appears that this recommendation has not been implemented yet;

- (b) Very few networks have implemented the recommendation relating to adoption of specification 3004, which applies mainly to new acquisitions.

8. Eighth Meeting of the Materials and Equipment

This meeting was organized in Kinshasa from 8 to 11 June 1982 and was attended by only three networks.

Due to the delicate nature of the problems posed by the adoption of the UAR coupling system and the coupling height of 825 mm plus or minus 5 mm as well as the use of compressed air brakes which can be regulated to engage or disengage, the tenth General Assembly adopted the Committee's recommendation that a meeting of the networks interconnected to the South African Railways should be organized under the auspices of the UAR.

It was decided to defer adoption of the other items considered at this meeting to the eleventh General Assembly.

Status of implementation

A new coupling height (height of buffer) should be studied and proposed to the next General Assembly. The same applies to compressed air brakes, which should also be reconsidered.

9. Ninth Meeting of the Materials and Equipment Committee

This meeting was held in Kinshasa, Zaire from 8 to 10 June 1983. The meeting reviewed the study on the UAR coupling system and buffer height. The recommendations made by the meeting were adopted by the eleventh General Assembly held in Arusha, Tanzania in 1983.

Status of implementation of the recommendations

The recommendations have not been implemented. The General Assembly asked for clarifications on the defined specifications.

#### 10. Tenth Meeting of the Materials and Equipment Committee

This meeting was organized in Kinshasa, Zaire, from 25-28 September 1984. The recommendations of the meeting concerning the adoption of the UAR coupling system were adopted by the twelfth General Assembly held in Libreville, Gabon in October 1984.

Recommendations made by the Bamako Seminar (Mali) on maintenance of tractive stock were adopted. These include:

- (a) Establishment of subregional centres for training operational staff;
- (b) Extension of the guarantee period for tractive units to five years;
- (c) Participation of African experts in the design, quality control and acceptance of rolling stock;
- (d) Setting up of a study group comprising representatives of UAR and co-operating organizations to define a policy on the design of simple but durable equipment;
- (e) Periodic maintenance - specifications to be prepared by UAR in cooperation with member networks;
- (f) Establishment of subregional central workshops in order to ensure optimum utilization of existing installations;
- (g) Supplies - forming subregional equipment purchasing pools;
- (h) Developing familiarity with equipment and providing on-the-job training for maintenance technicians. The cost of theoretical and practical training is to be borne by the equipment manufacturer.
- (i) Standardization of diesel engines;
- (j) Provision of comprehensive nomenclatures in sufficient quantities by the manufacturer for the rail transport networks;
- (k) Applied research;
- (l) Establishment of subregional tractive equipment factories;

- (n) Organization of a seminar on maintenance problems in the Sahel region;
- (o) Follow up of the recommendations of the Seminar.

Status of implementation of the recommendations

Although the specifications of the UAR coupling system have been defined, they have not been used yet by the networks. The networks continue to use their traditional coupling systems. Further information will be provided on the measures taken by the networks to adapt their traditional systems to the UAR coupling system.

With regard to the recommendations of the Bamako Seminar on tractive stock maintenance, the following observations can be made:

- (a) Nothing has been done to implement the recommendation;
- (b) The guarantee period widely used is still that given by manufacturers. The five-year period has not been implemented as yet;
- (c) Some networks have taken initial action to implement this recommendation but it should be noted that very few new acquisitions have been made. Information will be provided on the networks which have put this recommendations into effect;
- (d) A group comprising five representatives (one for each subregion) has been set up. Studies are under way;
- (e) Preparation of the specifications has started but is at a stand still;
- (f) The establishment of the central workshops has not started, although there has been some bilateral contacts among the neighbouring countries;
- (g) A study on the formation of subregional groups for bulk purchase equipment and of materials was conducted, with the assistance of the Banque Ouest Africaine de developement (BOAD) for West Africa, but no subsequent action has been taken. Nothing has been done in the other subregions;
- (h) Some networks have implemented the recommendations on training related to the markets. Further information is needed in order to identify these networks;

- (i) The study on the standardization of diesel engines has not been completed;
- (j) The recommendation regarding applied research has not been implemented yet;
- (k) The subregional tractive stock factories have yet to be established;
- (l) Plans have been made to organize the seminar on maintenance problems in the Sahel sometime in 1990 in Algeria;
- (m) The recommendations of the seminar have only been partly implemented. Further information will be provided on specific actions taken by each network.

#### 11. Eleventh Meeting

This meeting was organized in Lubumbashi from 3 to 5 September 1985. The Thirteenth General Assembly of the Union organized in Khartoum from 28 to 30 October 1985 approved the terms of reference for the definition of a policy on tractive units suited to Africa.

##### Status of Implementation

The experts group has been set up. The studies are under way except in Central Africa where no action has yet been taken. For East Africa, Zambia has replaced Tanzania which is no longer in a position to conduct the study.

#### 12. Twelfth Meeting

This meeting was organized in Arusha, Tanzania from 1 to 3 July 1986. The recommendations of the meeting relating to the policy on the design of simple tractive stock suited to Africa and to the study on bogies were adopted by the fourteenth General Assembly of UAR.

##### Status of Implementation

The experts responsible for conducting the study in the various countries have started their work, except those in the Congo. The countries concerned are:

- Mali, Zambia, Congo, Tanzania, and the Sudan for equipment suited to Africa;

- Mali and Tanzania for bogies.

### 13. Thirteenth Meeting

This meeting was held in Dar-es-Salaam, Tanzania from 21 to 23 July 1987. The fifteenth General Assembly of the Union adopted the recommendations of the Committee meeting.

As most of the items considered at this meeting related to studies, the major recommendation of the thirteenth meeting can be summed up as follows:-

- To conduct a study on the standardization of tractive equipment and establishment of indices for evaluating the performance of compressed air brakes and networking problems.

#### Status of Implementation

The study was started but has not been completed because of the failure of the networks to fill in and return the questionnaires. The SNCZ was designated as lead agency for the study. Member networks of this working group should continue their research and complete the study.

### 14. Fourteenth Meeting

This meeting was held in Nairobi, Kenya from 5 to 8 July 1988. The recommendations of this meeting were adopted by the sixteenth UAR General Assembly. They relate to the following ongoing studies:

- Study on compressed-air braking systems (study on specifications and standardization of the components of the UIC compressed air brake;
- Studies on trailer stock bogies;
- Studies on a policy for the design of tractive stock;
- Studies on a nomenclature of performance indicators for rolling stock.

#### Status of Implementation

Compressed-air brakes: The study on the standardization of the connecting gear of compressed air brakes in order to adapt them to climatic and operating conditions in Africa is under way, with SNCZ as the lead agency.

The study on trailer stock bogies and that on standardization of components in order to achieve uniformity of purpose, use and operation are to be summarised by Mali and Tanzania and the summary submitted to the UAR secretariat.

The status of the study on a policy for the design of tractive stock in the various subregions is as follows:

In the West African subregion: The study conducted by Mali was completed and submitted to the meeting of the Committee in Arusha, Tanzania.

In the Southern African subregion: The study by the Zambian Railways was completed and submitted to the meeting of the Committee in Dar-es-Salaam, Tanzania.

In the Northern African subregion: The study conducted by the Sudan has been completed but not yet submitted to the Committee.

In the Eastern African subregion: Zambia has accepted to conduct the study which Tanzania declared it was in no position to carry out.

In the Central Africa subregion: The study has not yet started.

Study on a nomenclature of performance indicators for rolling stock: This study is under way.

#### Abidjan Seminar

The Materials and Equipment Committee recommended equipping UAR with the following:

- A technology research centre;
- A training unit to organize and monitor training programmes;
- A research bureau since the researchers in existing bureaux are from the developed countries;
- African experts who will take part in studies on manufacturing design and control.

### Status of Implementation

Of all these recommendations, only the one on the use of African experts to conduct studies is now being applied.

#### 15. Fifteenth Meeting

This meeting was organized in Lubumbashi, Zaire from 3 to 7 July 1989. The meeting made the following recommendations on trailer stock bogies (wagons and coaches):

- (a) Thirteen instead of 36 types of bogies for wagons throughout Africa in the first phase, then four in the second phase and finally one UAR bogie for wagons in the third phase;
- (b) Eight types of bogies for passenger stock in the first phase, four in the second and one bogie in the third phase.

### Impact of the implementation of the recommendations and problems encountered by the networks

The secretariat of the Union does not have sufficient data for assessing this impact. Information expected from the networks will make it possible to determine the status of implementation of the recommendations in each country.

In order to obtain such information and to work out ways and means of implementing them, together with the networks, it is necessary for information to be collected within each network and to find out how far the recommendations have been implemented. This will make it possible to break down the countries into the various groups according to the status of implementation, namely:

- Countries which have implemented the recommendations;
- Countries which have only partially implemented the recommendations;
- Countries which have not implemented the recommendations at all.

For the last group of countries, the causes of non-implementation of recommendations should be sought as well as any financial, technical or other problems encountered.

All avenues should be explored to secure the information, by:

- (a) Sending all the recommendations and specifications adopted by the secretariat between 1976 and 1989 to each of the networks. These documents should be followed by a simple questionnaire for collecting information from the networks;
- (b) Ensuring that during mission travel by official of the secretariat to the networks, they find out the status of implementation of the recommendations;
- (c) Request members of the Materials and Equipment Committee to take all the necessary measures to determine enforcement of the recommendations within their in his own network and to present a report to the sixteenth meeting of the Committee;
- (d) Taking measures to ensure that information on implementation of the recommendations in countries which are not members of the Committee are collected and a report prepared for the sixteenth meeting of the Committee;
- (e) Fielding identification missions to each of the subregions to collect any further information;
- (f) Making ECA experts, during his missions to the networks to collect information for the finalization of the study on the evaluation of activities of the Materials and Equipment Committee;
- (g) At the current stage of the evaluation, it is not possible to give any definite information of the status of implementation of the recommendation in the networks of UAR member countries.

An addendum to this report should therefore be prepared after the status in the various networks has been ascertained and the necessary data for finalizing the evaluation report have been collected.

Within the framework of new guidelines concerning the work of the Materials and Equipment Committee of the UAR, the following proposals can be made at this stage of the evaluation:

- (a) Encourage and intensify inter-network exchanges in order to enable the countries which have implemented the recommendations to share their experiences with the other countries;
- (b) Assist the railway networks in their search for the necessary financing to undertake studies or to carry out the necessary changes called for by the recommendations;
- (c) Find ways and means of co-operating with countries which have technology research centres with a view to developing prototypes of components and parts to be manufactured in accordance with UAR standards and monitor the performance of such components;
- (d) Secure the participation of external experts in certain meetings of the Technical Committees of the UAR in order to benefit from their experiences;
- (e) The work of the Committees should not be limited to annual meetings. The topics discussed at such meetings should be examined in detail within the networks by study groups made up of experts drawn from all the subregions and from Africa as a whole. This approach will make it possible to develop the activities of UAR through the devotion of more time to and association of more experts with the study of the various topics for the development of railways in Africa;
- (f) Participation of ECA experts in some meetings of the technical commissions where the assistance of ECA could be beneficial in attaining the objectives of the Union;
- (g) The Chairmen and rapporteurs of all the committees should meet every three years to take stock of progress made. Such meetings should be chaired by the Secretary General of UAR and should take place before the General Assembly and the Symposium in order to harmonize and co-ordinate activities before adopting new guidelines for the working committees;
- (h) The secretariat of UAR should be provided with sufficient funds to enable it to monitor the performance of the railway networks and to be able to participate in the various studies which it should co-ordinate at the regional level, particularly implementation of the recommendations.

## **VI. SUMMARY OF RECOMMENDATIONS AND CONCLUSIONS**

It emerges from the consideration of the various recommendations adopted by the UAR General Assembly to date that most of the technical specifications prepared by the Materials and Equipment Committee have been aimed at standardizing international traffic equipment for the future interconnection of African railways. In view of the need to develop the various networks, the activities of the Commission should be oriented towards finding solutions to the specific problems whose solution would have an immediate impact on the performance and management of the networks.

To this end, it is absolutely vital to find out how far the recommendations and resolutions have been implemented in the networks of the UAR member countries so that the Union would have the reliable information necessary for directing future activities.

Having done this, co-ordination between the activities of the UAR and ECA will make it possible to take stock of achievements, analyze and determine action needed and make plans for future activities that would enable the Materials and Equipment Committee to meet the specific and immediate needs of member networks in terms of the development of railways in Africa.