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Workshop on Maintenance Management
in the Industrial Sector

Kampala, Uganda, 17-19 November 1993

REPORT*

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INTRODUCTION

1. The Workshop on Maintenance Management in the Industrial Sector for English-speaking African countries was held at Kampala, Uganda, from 17 to 19 November 1993. It was attended by 20 participants from 5 countries (see Annex I).
2. The Workshop was organized by the United Nations Industrial Development Organization (UNIDO) in cooperation with the Ministry of Trade and Industry of the Government of Uganda.
3. The Meeting addressed the issues and problems which hindered the most effective use of the large quantity of installed machinery and equipment in African industries, and thus their contribution to the economic development process. The Workshop mainly aimed at raising and increasing the awareness of decision-making centres of national governments as well as company managers to the importance of maintenance policies and activities with a view to achieving higher standards of industrial productivity and efficiency.

CONCLUSIONS AND RECOMMENDATIONS

4. The observed phenomenon of the very rapid deterioration of acquired technology, including modern equipment and technical systems, has impeded the industrialization of the majority of developing countries. This phenomenon can be seen at all levels, especially in the following sectors and subsectors: industry, transport and communications, water supply and drainage, production and distribution of electricity, cement, steel, the food industry, agricultural equipment and fertilizers. The facts show that governments have not been able to find adequate ways of monitoring this process in their countries. As a result, at the macroeconomic level, the rate of return on investment is not only lower than it should be, but will very soon fall to zero. Indeed, in some developing countries, a 30 per cent reduction in the life of equipment due to lack of maintenance is one of the inevitable consequences. This situation leads to additional costs, lower production, unrealized profits and loss of markets, for all of which it is impossible even to estimate a figure. In certain countries, one can find graveyards of abandoned machines and equipment, machines operated beyond the limits of safety and endurance, spare parts gone astray, orders being placed for new equipment rather than for the repair or maintenance of that which already exists, and the import of goods that should have been locally manufactured but for the defective equipment.
5. If this trend is to be reversed, there is an urgent need for changing the way the maintenance function is perceived in industry. So far, maintenance has, in most cases, been regarded as a case-by-case servicing and repair of malfunctioning equipment in order to prevent production stoppages. The

Workshop helped the participants to realize that maintenance management is much more a matter of comprehensive system involving all divisions of an enterprise. Therefore, it is felt that Governments, industrial circles and enterprise managers ought to be made aware of the problem so as to encourage them to formulate and implement permanent maintenance policies or systems. That implies establishing an administrative structure, releasing the necessary credits, acquiring maintenance equipment and supplying training at all levels and in all areas of maintenance activity.

6. There is a need to create a sense of responsibility for the better care of the machinery and equipment dearly acquired. This attitude should begin with the integration of maintenance managers and production operators as far back as the moment of negotiations for machinery procurement. Maintenance costs should form part of feasibility studies.

7. Whereas it is in the general interest of the United Nations agencies as a whole to promote a greater awareness of the need to maintain the company's investments, maintenance should be part and parcel of the corporate culture. Any investment aiming at fostering such an awareness, training of personnel at all levels to acquire knowledge, skills and develop adequate attitudes to maintenance, would be highly desirable.

8. For effective improvements in the performance of African economies, any drive to upgrade the maintenance function in industry would have to deal with production equipment and technological changes, human resources development, organization and management, material resources, infrastructural environment and the cultural dimensions (attitudes, community standards).

9. Many African countries are constrained to rely on the supply of spare parts from abroad. To reduce this foreign dependence, African countries should promote such activities as the publication of directories of existing capacities; and then explore the possibilities of creating small plants for local manufacture of simple spare parts which can gradually be upgraded to fabricate more complex components, depending upon the stage of development of each country.

10. Priority should be given to the establishment of national maintenance associations or to strengthen the existing ones to serve as a forum for exchanging information and experiences as well as for needs assessment. The aim should be to develop a national maintenance strategy which would help maintenance personnel in the acquisition of corporate culture with a view to bridging the gap between corporate management and maintenance personnel in order to facilitate the formation of a better company structure. Furthermore, this strategy should constitute the framework for designing regional programmes in the field of industrial maintenance. UNIDO should assist, upon request, African countries to implement these regional programmes.

11. In view of the relative unfamiliarity with the concept of the maintenance function itself in many African industries, computer aided maintenance should be introduced gradually. Bringing data processing in maintenance management, the starting point should be to train the personnel to use the machines/computers.

12. In view of the importance of the subject, UNIDO was requested by the representative of Seychelles to organize a national workshop on maintenance management in his country to sensitize industrial circles and company managers on maintenance problems, and encourage them to formulate and implement maintenance policies or systems as appropriate.

13. UNIDO was also requested to assist Uganda Metal Industries Development Association (UMIDA) - whose main objective is the promotion and development of metal engineering in the country - in areas such as training of maintenance operators, flow of technical information and industrial research and development.

I. ORGANIZATION OF THE WORKSHOP

Opening of the Workshop

Statement of the Commissioner for Technology, Ministry of Trade and Industry

14. In his opening remarks, the Commissioner for Technology, Mr. Stephen KAGODA, on behalf of the Honourable Minister of Trade and Industry, Mr. Richard KALJUKA, welcome the delegates to Kampala. At the outset, he pointed out the potential for, and factors affecting the upgrading of the maintenance function in African industries. He stated that maintenance is a key to produce quality goods and services and be competitive in the market place. The factors underlying frequent breakdown and stoppages of machinery and equipment were many. These included the lack of adequate management, erratic supply of spare parts, unskilled personnel etc. He stressed the importance of maintenance as an integral part of overall management in any industrial activity. Thus, preventive maintenance should be a day-to-day practice. He was grateful, therefore, to the United Nations Industrial Development Organization (UNIDO) for taking the initiative in organizing this Workshop in his country on a topical subject of particular importance to all developing countries. The Commissioner for Technology concluded by observing that there was a strong feeling among the development actors in Africa that recommendations reached at workshops/meetings ought to be translated into actions and actually implemented once the workshop was over. Therefore, he called upon UNIDO to make every effort to meet this need as far as possible for the benefit of both UNIDO and the recipient countries.

Statement by UNIDO Secretariat

15. In his address to the Workshop, the Chief of the Unit of Common Topics, System of Consultations Division, expressed his gratitude to the Government of Uganda for hosting the Workshop in Kampala. He then welcomed the delegates for accepting to participate in an event to which UNIDO attached the greatest importance. He pointed out that the Workshop had been organized by the UNIDO System of Consultations Division to encourage an exchange of experience between the participants and, above all, to raise awareness of the importance of maintenance as a tool for increasing the profitability of industrial enterprises. He then set the two main objectives of the maintenance function: first, to keep equipment operational and reliable throughout its service life and, secondly, to optimize the utilization of equipment in maintaining uninterrupted production. He said, it was therefore essential, both at the macro- and micro-levels, to adopt a clearly defined maintenance policy to which decision makers and workers would be genuinely committed. Such a policy should aim at achieving measurable results, notably increased production and returns, and bring about further steps of progress. He concluded by disclosing that UNIDO, together with ILO, had produced a maintenance management manual, which would be available as a sales publication in 1994.

Election of the Bureau

16. The following officers were elected:

Chairman:	Adam M. Sebbit (Uganda) Lecturer, Faculty of Technology, Makerere University
Vice-Chairman:	Margaret M.N. Kayemba (Uganda), Managing Director, Uganda Plastic Industries
Rapporteur:	Herman Ngwenya (Botswana), Head of Engineering Department, Sugar Industries (PTY) Ltd.

Adoption of the Agenda

17. The Workshop adopted the following programme:

1. Opening of the Workshop
2. Election of Chairman, Vice-Chairman and Rapporteur
3. Adoption of the Agenda and organization of work
4. Presentation of the Working Paper followed by discussions
5. Adoption of the conclusions and recommendations of the Workshop
6. Closure of the Workshop.

Documentation

18. The Information Paper issued for the Workshop is: Maintenance Management IPCT.185(SPEC.)

II. SUMMARY OF DISCUSSIONS

19. Before introducing the issues for discussions, most speakers expressed confidence in UNIDO, commending the Organization on the fine work done in preparing for the Workshop. They also expressed appreciation for the selection of Kampala as the venue of the meeting and thanked the host country for its support and hospitality.

A. Common maintenance problems in industry

20. As a general introduction many participants gave a summary of the potential for, and factors affecting the improvement of maintenance management in industrial plants in most African countries.

21. Several participants recognized, however, that the main factors underlying the lack of maintenance in African countries and which seemed to have played a determinant role could be attributed to:

- (a) The centralized policy structure in many African countries, placing the decision making and resources allocation at a level far above those who suffered the consequences of inadequate maintenance in the industrial sector and in the economy as a whole;
- (b) The introduction of new technologies, for which there is not yet an adequate technical know-how and repair capability available; and
- (c) The tendency among decision-makers in the public sector to prefer investments in new machinery and equipment rather than the repair and maintenance of existing ones.

22. It was observed that by highlighting the maintenance function and taking account of its various aspects, one could help to solve the crucial problem of maintenance in many industries. Some participants pointed out the supply of rigorous and thorough training programmes and the provision of complete and intelligible documentation were essential to ensure the full utilization and longevity of the means of production. In addition, an industrial project was much more than simply a matter of supplying equipment and services. It was an integrated process in which production, operation and maintenance should play a major role from the start.

24. Concern was expressed regarding the local manufacture of spare parts. The absence of domestic plants and production capabilities inhibited the local manufacture of these items in most African countries. Moreover, the unfavourable industrial environment within which factories operated in these countries was a limiting factor for profitable investment in that field.

25. With regard to the negotiations of technology transfer and contractual arrangements, several participants stressed the need to take into account the local conditions and needs of African countries.

B. Economic considerations about maintenance

26. One participant requested that governments, state-owned enterprises and private companies put more emphasis on maintenance, rehabilitation and restructuring of existing industrial as well as social establishment than on procurement of new equipment by (i) developing and inculcating maintenance culture, (ii) investing more in maintenance activities and (iii) forming national spare parts manufacturing associations with the assistance of UNIDO.

27. The view was expressed that increased production and the profitability of industrial facilities should be a matter of concern to all governments, especially in Africa. Statistics showed that proper maintenance practices would lead to a considerable increase in production and profitability.

C. What maintenance really is

28. It was noted that the need to accept maintenance should not be seen as a burden for top management but rather as a productive organizational tool through which productivity could be increased and, as a result, profits maximized. Accordingly, the role of maintenance in any organization needed to be regarded as an art, a science and a service whose main objectives were to ensure that the plant or equipment was reliable, maintainable and operational. That, unfortunately, was often not the case. However, in their efforts to fulfil this task most African and other developing countries were faced with constraints that affected the maintenance activities. These included lack of qualified and skilled personnel, lack of machines and equipment suitable for making spare parts, lack of tools for quality control of these spare parts, lack of adequate and appropriate raw materials for manufacturing these parts, and others. To promote a greater awareness of the need to maintain the companies' assets, maintenance had to be included in the day-to-day activities.

D. Maintenance planning and implementation

29. Several participants pointed out that the availability of financial resources and skilled personnel were essential to establish a functional maintenance system at enterprise level. The system had to be functional in the sense that its tangible and intangible results should be apparent to and appreciated by the whole enterprise, with performance indicators reflecting a direct increase in productivity.

30. Most participants recognized the merit and usefulness of computer aided maintenance management. However, this support should be introduced gradually and cautiously in African industries, because of the relative unfamiliarity with the concept of the maintenance function itself. Bringing data processing into maintenance management, the starting point should be a proper and adequate organizational structure and training of personnel to acquire skills and attitudes to maintenance in industry.

31. For improved maintenance and sustained life-span of new equipment, participants felt that considerable attention should be given to local conditions of services and upgrading of technical capabilities through training at earlier stage, which should also be included in the contractual arrangements.

32. It was felt that industrialists in Africa had similar maintenance problems and needs. In the light of this fact, participants agreed to establish national maintenance associations or to strengthen the existing ones in order to serve as a forum for exchange of information and experience and for needs assessment, with a view to designing a national maintenance strategy. The aim of this national effort would be to sensitize decision-makers and, if possible, to integrate maintenance policies and practices both in corporate and economic management of African countries. This first step should lead, in the future, to the design of regional programmes in the field of industrial maintenance.

33. One participant requested UNIDO to assist the Uganda Metal Industries Development Association (UMIDA) in areas such as training for maintenance operations, supply of technical information, and support to industrial research and development efforts of the Association. In this regard, the participant suggested that the Ministry of Trade and Industry of Uganda should cooperate with UNIDO to establish a National Maintenance Training and Advisory Centre in the country.

34. Most participants stated that UNIDO should publish the results of the meeting in order to sensitize the decision-makers and advise them to integrate maintenance policies and activities in the overall corporate and economic management of their respective country.

Annex

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