# A Research on Maintenance Management in Somalia

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## Foreword

SIDAM — The Somalian Institute of Development Administration and Management — is the only Institute in Somalia to deal systematically with the development and personnel training in the management area.

SIDAM was formed in 1965 and through it an average of one thousand students are trained each year. The following courses are currently organized at SIDAM:

*a*) Accountancy: 2-year post secondary school course;
*b*) General Management: 1-year post secondary school course;
*c*) Industrial Management: 1-year post graduate course;
*d*) M.B.A. — Business administration course;
*e*) Maintenance and store management: 3-month course;
*f*) Computer science and management: 3-month course;
*g*) Personnel administration: 3 week course;
*h*) Courses on English and French.

For some years now the Italian Technical Co-operation has contributed the organization and management of the courses stated under paraghaphs *e*) and *f*) to the activities of SIDAM through Cotecno, a Rome-based company.

The didactical methodology has been enhanced through the years to approach more and more the actual needs of Somalia and the problems stemming from the tranfer of nonindigenous technologies into a different social context.

In such a frame «case studies» on stock maintenance organisation and management of some Somalian companies were construed and examined, and a research work whose results are presented herewith was prepared.

## The Research

Somalia's main surfaced roads should be relatively easy to maintain. Only asphalt needs to be imported. All other materials, and the semi-skilled and unskilled manpower, are available locally. Yet the roads are not always in good condition. Some stretches remain rough and potholed. And as the cars, buses and trucks

rattle over them every day, their tyres wear out faster, their parts loosen and break more easily.

The net result? Much more hard currency goes into motor parts than would be needed for the asphalt to keep the roads reasonably smooth in the first place.

The same situation applies with the electricity supply system. Voltage should be kept at a steady level at all points of the network. Yet at times, in some areas, it rises up to 50 per cent higher than the rated value. Once again, this results in the breakdown of electrical equipment — and the whole dreary chain of unnecessary effects: power cuts, stoppage in productive activity, and heavier-than-necessary outlays of foreign currency to import replacement equipment.

These are just two of several examples recorded by a team of Italian Technical Cooperation (ITC) experts in the course of research on maintenance management in Somalia. Their study, «A multinational comparison of maintenance management: the case of Somalia, Italy and USA», was completed recently. The experts, from the Italian consultancy company Cotecno, are attached to Sidam.

The study looks at how much attention, resources and planning are given in each country to maintenance, which is one of the first and most important steps, perhaps the most important, for any country embarking on the road to industrialization.

In fact, learning to maintain equipment properly should come before using it for production. Plunging straight away into the establishment of new types of industry is dangerous, without the necessary knowledge of machinery and processes. A better approach to industrial development is to proceed by stages. First, procuring the equipment in some specific field from abroad, then becoming familiar with it and learning to maintain it properly. Only then when a body of competent people have been formed, can production be started in that sector.

Maintenance can help in fostering an «industrial mentality» — certainly more effectively than by pushing industrialisation with no solid preparation to support it.

The importance of maintenance in the operation of a factory or plants is not always readily recognized. Usually «maintenance costs» are considered as the sum of annual expenditures for maintenance personnel, equipment and spare parts.

Due to the difficulty of comparing absolute values among countries or industrial sectors, maintenance costs are, as a rule, expressed as a percentage of invoiced sales and/or capital investments. The indices for capital investments are not reliable in the Somali situation, since sometimes plants and machinery are obtained through external support to the construction of new factories.

The survey data relative to the index of maintenance costs (expressed as a percentage of sales) in Somalia are shown in Table 1. Practically all public enterprises in the Benadir region were covered, including ENEE and a private soap and detergent firm. The Somali indices are compared with the indices in the same industrial sectors in the U.S.A. and Italy. As will be seen, a picture emerges which gives some important hints for future actions in the field of industrial management.

The fact that maintenance costs increase percentagewise as one moves from an industrialized to a developing country does not, as a rule, indicate that the poorer the country and the more inflation-prone its economy, the higher investments become. Rather, at least in the case of Somalia, the higher level of the index as compared to the US and Italy reflects a lesser degree of plant and manpower utilization.

In other words, sector-wise, the maintenance costs of companies using similar

Table 1 - *A comparison of maintenance costs in different industrial sectors as between U.S.A., Italy and Somalia*

| Industrial sector | U.S.A. | Italy | Somalia |
|---|---|---|---|
| Electrical | — | 3.3.% | 4.0% |
| Mechanical | 2.5% | 2.3% | 6.0% |
| Chemical | 4.8% | 11.3% | 7.5% |
| Foodstuffs | 1.6% | — | 6.0% |
| Weighted Average | 4.7% | 5.1% | 6.1% |

equipment should be roughly equal in real terms. But the fact is that in Somalia the equipment would be used for fewer hours than in the other two countries, due to the shorter work-shifts. Hence the volume of production — and consequently the volume of invoiced sales — would be less. Thus the ratio of maintenance expenses to invoiced sales is artificially increased.

A further analysis carried out by the Italian team concerned the breakdown of maintenance costs into «emergency» and «programmed» maintenance costs. Emergency (or breakdown) maintenance is the kind that must be carried out immediately to avoid more serious damage. It is usually done when machine failure causes an interruption in the production flow, or for safety reasons. Programmed maintenance is nothing else but organised maintenance, carried out according to a preestablished schedule. Preventive, ordinary and improvement maintenance are usually programmed. The results of this analysis are shown in Table 2.

Table 2 - *A comparison of breakdown and programmed maintenance as between Italy and Somalia, by sectors.*

| Industrial Sector | Breakdown maintenance | | Programmed maintenance | |
|---|---|---|---|---|
| | Italy | Somalia | Italy | Somalia |
| Electrical | 65% | 35% | 35% | 65% |
| Mechanical | 65% | 40% | 35% | 30% |
| Chemical | 20% | 70% | 80% | 30% |
| Foodstuffs | — | 70.5% | — | 29.5% |
| Weighted Average | 55% | 54% | 45% | 46% |

In relation to the sample considered, there would appear to be some similarity in the distribution between breakdown and programmed maintenance in the two countries. However, even allowing for a substantial difference between the two cultural and technological environments, some divergencies do exist.

Programmed maintenance is particularly important in the chemical sector; the breakdown of one machine in a chemical plant immediately brings the whole production process to a stop. Table 2 shows that breakdown maintenance in the Somali chemical sector is more frequent than in Italy.

Somalia should make more use of programmed maintenance than Italy, especially considering two factors: in Italy, a machine breakdown is normally repaired in a matter of hours. Not so in Somalia, where sometimes there is a lack of personnel with the necessary knowledge of that specific machinery and/or spare parts. Secondly, in most cases in Somalia a factory is the one and only factory existing in a given industrial sector. For instance, if the refinery stops working, the whole national economy is jeopardised. If the «pasta» factory does not produ-

ce, one has to resort to expensive hard currency purchases from abroad. This is not the case in industrialized countries, where occasional breakdown maintenance generates only a small and localized economic loss, since repairs would take a short time, and it is possible to resort to alternative sources of production. Not one, but many plants exist in each sector.

The inadequate importance attributed to maintenance in Somalia is shown also by the data in Table 3. While in Italy in most of the firms the maintenance supervisor is under the general manager or plant manager, in Somalia he is often under lower-ranking officials, who at times have no connection with, or knowledge of production activities.

Table 3 - *Position of the maintenance function in the organizational structure of industrial units*

| Maintenance Supervisor reports to: | Italy | Somalia |
|---|---|---|
| General Manager or Plant manager | 70% | 12% |
| Production Manager | 18% | 33% |
| Others | 12% | 55% |

Note: The answers to the question «Who is the boss of the maintenance supervisor?» clearly show that in Somalia the maintenance function is not given a high level in the organizational structure of industrial units.

The Cotecno research team also investigated the existence of formalised procedures for the organisation of maintenance work. On the bases of the findings shown in Table 4, it appears that this practice is little followed in Somalia. It was ascertained that almost no company has a Machine Diary showing the frequencies and the nature of machine breakdowns or the type and extent of preventive maintenance activities performed. «Request for Action/Job Order» forms exist, but no control action is really activated. One third of the factories do not even control or manage maintenance materials.

Table 4 - *Use of formalised procedures for maintenance activities (percentual values)*

| Procedure | Percentage of industrial establishments NOT using procedure | |
|---|---|---|
| | Italy | Somalia |
| Request for Action/Job Order | 15.1% | 22% |
| Job Preparation | 18.9% | 44% |
| Requisitioning from store | 3.7% | 33% |
| Updating Machine Card | 32.0% | 89% |
| Allocation of Standard Work Times | 80.5% | 56% |
| Workload Observation and Control | 48.3% | 78% |
| Observation & Control of Labour Utilization | 26.3% | 100% |
| Observation & Control of Performance | 35.5% | 89% |
| Maintenance Budget | 1.5% | 66% |
| Control & Management of Maintenance Materials | 9.7% | 34% |

There is, then, wide scope for improvement, to the immediate benefit of the industrial enterprises and of the economy as a whole. One possibility of improvement is to use computers for maintenance and storeroom management. In Somalia, computers have never been used in support of maintenance management, or for the control and diagnosis of the production process. This is usually justified by saying that the computers is a «labour-saving» device. One of the problems

of a developing country is to provide job-opportunities, so that, also considering that labour tends to be cheaper than elsewhere, a «labour-intensive» approach is adopted.

This justification forgets that the computer is mainly a tool that is of invaluable assistance in improving the level of services, safeguarding and ensuring easy access to the wealth of information available in an enterprise, promoting technological innovations, by storing in a computer programme the knowledge and know-how contributed by expert personnel, ensuring better monitoring and control of the equipment, and simplifying «troubleshooting» in case of machine failure.

Utilizing the so-called «packages», or ready-made computer programmes, all one has to do is to feed the data into the computer, which will then take care of all the calculations and analysis and eventually print out the final solution.

This means that it is possible to make use of relatively unskilled people also for the performance of complex jobs. This is precisely what is needed in non-industrialized countries, where there is no dearth of workers, but they are often not very skilled.

Higher maintenance costs means a reduced value of production, while the total cost of the output is higher. In this situation, it is harder to compete with imported goods. When machinery breakdowns occur, not only the profitability, but at times also the viability of the enterprise suffers.

Clearly, then it is necessary to invest more in maintenance management and activities in Somalia. There is no magic recipe bringing immediate results. The best course of action should rest on two criteria: providing training at all levels, and fixing clear objectives of improvement year by year.

Their practical application calls for a strong push in the right direction, i.e. ensuring the involvement of top management and making maintenance and its management a matter of high priority in the policies of governmental and foreign organizations working in Somalia.

Under the auspices of the Somali Government and of the Department of Cooperation for Development, of the Italian Ministry of Foreign Affairs, Cotecno with the support of Sidam runs three-month courses on maintenance-management. There are participants from both public and private Somali enterprises.

The methodology contemplates the discussion of practical cases, the presentation of maintenance management, and an analysis of the problems involved in the transfer of technologies.

Within the scope of a three-year programme of cooperation between Cotecno and Sidam, it is envisaged to repeat this training program, which will become an institutional feature of Sidam and will eventually be run by the Institutes' staff, not only in Mogadishu but also in the major towns of Somalia.