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FINAL REPORT

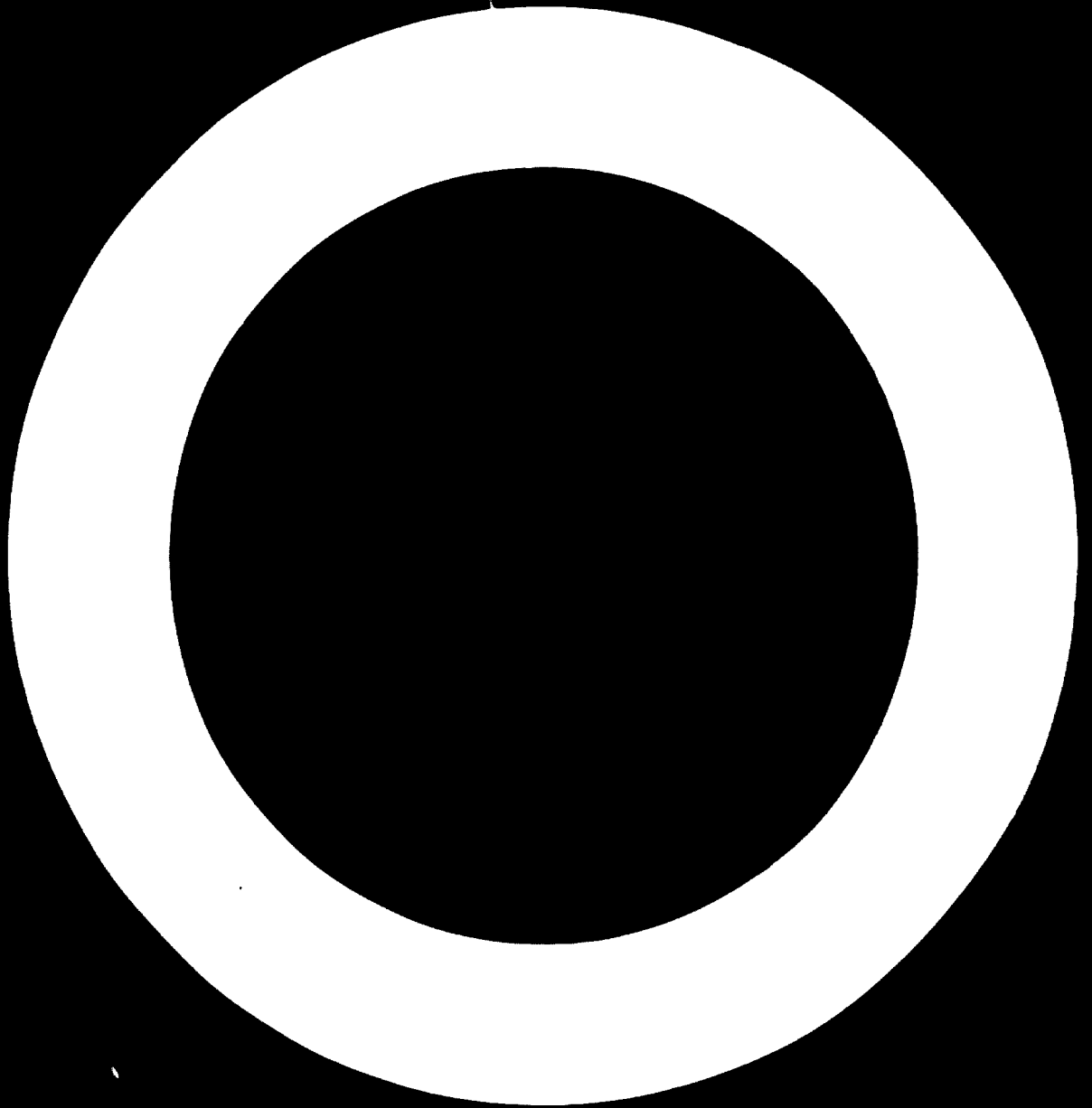
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**On Repair and Maintenance of Industrial Equipment
In Syrian Arab Republic**

UNIDO Purchase Order No. SES 68-259.

BUDAPEST, 1969.

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FINAL REPORT

**On Repair and Maintenance of Industrial Equipment
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UNIDO Purchase Order No. SAS 68-259.

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BUDAPEST, 1969.

Abstract

This Report on one hand deals with the characteristic features of repair and maintenance of industrial equipment in the Syrian Arab Republic and on the other hand concludes in recommendations to improve the level and standard of their activities. The statements and conclusions of the Report are based on the direct experiences and observations of a team of two experts visiting more than 30 different firms and enterprises all over Syria in a period of one month.

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I. Preface

Preliminaries

The United Nations Industrial Development Organisation /UNIDO/ intends to start a long-term campaign for the improvement of repair and maintenance services of industrial equipments in the developing countries.

With respect to the above theme the UNIDO made a contract with TESCO Consulting Engineering Co. to carry out a survey of existing repair and maintenance services in the Syrian Arab Republic and to prepare a report and recommendations for helping UNIDO:

- to formulate a long-term working programme for the technical assistance to be rendered,
- to identify the crucial spots of industries where assistance would be urgently needed,
- to draw up a long term policy for assisting developing countries in the field of repair and maintenance.

Short description of field work

The field study under contract was carried out by a team of two experts - the signers of this report. The team having been briefed by the UNIDO staff members concerned in Vienna arrived to Damascus on 5 January 1969.

The team was accompanied by Mr.A.Fedorov of UNIDO and was received by Dr.R.Nahas of the UNDP. Resident Representative's Office that later on worked as a liaison office between the team and the Industrial Authorities of the Syrian Arab Republic.

In the first few days the team with the highly appreciated help of Mr. Fedorov and Mr. Nahas called on those Ministries and industries supposed to have interest in the success of the survey. The following ministries were selected

- Ministry of Industry
- Ministry of Oil, Electricity and Executing of Industrial Projects
- Ministry of Municipal and Rural Affairs
- Ministry of Communications
- Ministry of Agriculture and Agrarian Reform
- Ministry of Planning and Directorate of Statistics.

During their visits the team informed the Authorities about the aims and limits of the survey and asked them to single out those characteristic samples of enterprises, firms and factories under their guidance, where the team could collect necessary and satisfactory information to create a real picture of repair and maintenance activity, and to help to identify the crucial fields and problems where immediate remedy would be necessary.

During the period of 9 to 12 January in close cooperation with the Ministries and Dr. Nahas the team agreed on a programme of visiting more than 30 different firms and enterprises in the district of Damascus, Homs, Hama, Aleppo and Deir-er-sor. However later that programme of visits in accordance with the team's request was extended to the following institutes:

- Technological Institute of Damascus
- Industrial Training Center of Aleppo
- Management Development and Productivity Center.

From 13 January to 5 February the above mentioned programme was executed according to the schedule. The detailed programme and schedule see in Appendix A.

Basic data of Final Report, their sources and face values

It can be stated that during the study the team succeeded in collecting on a whole the necessary basic information for qualifying the activity and services of repair and maintenance in Syria, due to the kind help and understanding of the Authorities concerned, but as for the data required for quantitative analysis stipulated in the contract the ministries and firms were unable to provide. Therefore to fill the gap the team has requested the Directorate of Statistics to furnish the basic information being at their disposal concerning to the main industries and firms, to their impacts on national income and export etc. They have, with deep understanding the problems tried to do their best, but with a few exceptions /see 1.32/ due to lack of previous survey they could not answer.

For composing the Report the following data and sources were used:

Personal observations and experiences

The Report is primarily in compliance with the briefing of the UNIDO based on the team's personal impressions and informations collected during the field study. Considering the short time at disposal it was out of question to get trustworthy and genuine written answers or to analyse the specific points of view of repair and maintenance on the spot. Therefore the gathered informations were in many cases supported only by the outlook of visited factories, their equipment and repair facilities, and by verbal explanations given by the leaders concerned. The subjectivity of partners, the contradictions in the answers, observations on the field and other informations were filtered by experts and only those data were used for qualifying the picture

on repair and maintenance which had been supported by the own practice and experience of the team members.

Written documents and data

Working out the report to verify the importance of main industries from the aspect of national economy and to scale the significance of the visited firms statistical abstracts and other authentic sources were used. These sources are enumerated in the bibliography.

It is regrettable but must be mentioned that sometimes among the different sources have been significant deviations. In case of doubt it is noted on the table and the inserted data may be accepted with restrictions and can be used only for evaluations /see appendix B/.

Method of evaluations and character of recommendations

Considering the relatively great number of existing industries, enterprises and factories, and the number of visited firms /see table 2/ the team's method generalising the resume of observations of a few samples to the whole lot, may be accounted a kind of sampling system. The fact that the chosen individual firms and industries cannot be considered as accidental ones - because they were mainly selected on the base of which of the authorities concerned and their importance or impact on national economy - is counterbalanced their share of relatively great number of labourers from the total and by the observation that the important symptoms were common in every visited enterprise.

Consequently the observations and recommendations can be taken as characteristics of the repair and maintenance services in S.A.R. and the conclusions are based on a good average.

II. National Economy and Qualification of Repair and Maintenance

1. Important Industries including Transport and Agriculture

The facts and observations outlined below follow the sequence of items stipulated in the contract in paragraph III/1-4 of annex "A". If more items are drawn together under one heading the referring letter used for each item is indicated.

a/ Structure

Industry

The majority of industries is nationalized and at present it is working under the guidance of two Ministries namely:

- Ministry of Industry
- ▲ Ministry of Oil, Electricity and Executing Industrial Projects

The significant industries being subject of present survey are:

- Textile Industry
- Cement Industry
- Sugar and Food Industry
- Petroleum Industry

The overwhelming percentage of the industries are concentrated in three districts namely:

Damascus
Homs-Hama
Aleppo.

Near the total of industrial establishments belongs to the processing industries. The machine industry is underdeveloped and is almost totally missing.

The underdeveloped machine industry means that there are no specialized or centralized workshops of reasonable size in the S.A.R. with the exception of some small-scale industries. This small-scale industry consists of comparatively numerous private owned small workshops. They are the only producers of locally made equipment and machine parts. This private trade is mainly located in the city of Damascus and Aleppo and is rather well equipped, every workshop has a few universal machine - tools and in average 5-10 workers.

A short description of the visited factories and enterprises representing the surveyed industries can be found in appendix "C". Some other important, but not visited firms given by the Directorate of Statistics are enumerated on table 8.

In the opinion of authorities concerned there are no significant alterations allocated in the next future to improve the structure and to upgrade the production of the surveyed industries. The only exception is a planned investment of new factory for assembling and partly manufacturing of agricultural machinery and tractors and in certain extent for producing machined special parts to other industries. It has to be mentioned that for the time being only the preliminary steps have taken place in the realisation of this project.

Transport

For the time being this sector is directed by two ministries namely:

- Ministry of Communication
- Ministry of Municipal and Rural Affairs.

The first Ministry is responsible for intercity transport and postal services, the second is interested in the traffic within the limits of settlements.

Based on the wish of Authorities only the road transport and railways were surveyed.

Grading the visited branches from the point of view of territorial and industrial connection at present the road transport has more importance than railways. The reason of this statement is that the railway connections between the valley of Euphrates and the Mediterranean sea via Aleppo is only being built and there is no direct railway connection between Aleppo and Damascus on Syrian territory.

The majority of road transport park is private owned. A short description of the visited state owned firms representing the railway and road transport can be found in appendix "C". The registered transport park is to be seen in table 3.

Agriculture

With regards to the wish of Authorities the survey was extended to the farming equipment too.

Practically the agriculture belongs to the Ministry of Agriculture and Agrarian Reform. The level of mechanization is rather low. The majority of equipment is private owned. For the state owned park machine stations are organized in the main agricultural regions.

The registered farming equipment can be seen in table 4.

c,d Importance in national economy and in field of export

The importance of the surveyed sectors and their share in the national income can be seen on table 1.

The number of persons employed in the different manufacturing industries and the rate of employee of the visited firms to the total can be found on table 2.

Among the different industries and sectors besides agriculture only the Petrole, the Textile and in some extent the Food Industry has export interest. worth mentioning /see table 5 a and 5 b/.

b,e Age of firms, type, age and condition of their equipment

Industry

The average age of industrial firms and equipment may be estimated to 10-15 years. In the field of traditional industries such as Textile, Cement, Sugar and Food, firms of 15-30 years old occur too. The Petrole Industry and approximately near to 50 % of Textile Industry is younger than the average.

The age and foundation time of the visited firms can be seen in appendix "C" and for a few important textile factories in table 8.

The equipment both in the production and maintenance of the visited firms was supplied by different countries and consisted of different types. The exceptions were the Sugar, Food and Petrole industries where the supplier of the equipment had been mostly the Skoda Works of Czechoslovakia and the Cement Industry where the majority of plants had been delivered by Germany. It may be stated that in certain extent in other industries the deliverer of

older firms had been of western countries and of younger ones of eastern countries.

Among the different kind of equipment dominant types were not identified.

The condition of equipment taking into account the time of delivery with a few exceptions is satisfactory. Detailed explanation see in paragraph 2 a.

Transport

The transport park in the visited firms were delivered by different countries and consisted of different types, Dominant types were not indentified.

The average age of the road transport park may be estimated for more than 4 years because of the import restrictions in the last 4 years. Due to this fact and the ruling traffic conditions the state of the road transport park is rather worn out.

The same statement can be concluded with regards to the service-stations too.

The railways rolling stock is obsolete and worn out, but considering the secondary importance of the railways it serves the purpose for the time being.

The repair and maintenance facilities of Syrian Railways both from the point of view of rollings stock and their own equipment are adequate, however the equipment are out of date, One has to mention that both the Aleppo and Damascus workshops are the largest and relatively the best equipped engineering establishments in S.A.R.

The age and foundation time of the visited firms can be found in appendix "C".

Agriculture

More than 50 % of the registered machine park /see table 4/ is older than 5 years. According to the team's experience and the collected information generally near to 50 % of the total machine park is out of work because of the shortage of servicing capacity and lack of spare parts.

2. Existing Repair and Maintenance Facilities

a/ In different firms according to sectors

Industry

It can be stated that every visited factory, plant or enterprise has its own more or less equipped maintenance department. Each of these departments consists of a small staff working under a responsible leader workshop /or shops/ and spare parts store /see table 6 and appendix "C"/.

The outfit of staff even in the bigger firms are under the necessary level both in number and qualification. For instance with a few exceptions there are no technicians or trained draftsmen to specify the worn out machine parts to be replaced, to deal with the machine manuals or spare parts inventory and to fill up the cards regarding the history of machines. In most cases the repair and maintenance programmes are prepared but the proper organizations and conditions /see below/ to carry out these programmes are missing.

In general the machinery of the workshops can be considered in number and in composition as adequate, however to some extent the machine tools are outdated and the accuracy of their work is doubtful. Here it must be mentioned that the validity of "adequacy" is attached to, two conditions, namely: well

functioning spare parts supply and in the case of emergency some machine industrial back-ground for manufacturing those heavier or intricate machine parts which are not previously programmed. These conditions at present are not properly secured therefore each firm has an aspiration to build up a technological complex especially in metal and ferrous casting, in heattreatment in machining either heavy, or intricate parts. special gears, in repairing and rewinding of electric motors and appliances, for solving its own spare parts supply and replacement of worn out machine parts. In the team's opinion there is no need to prove that this solution is below the economical limit, and because of the lack of acceptable working conditions the proper quality of product in those "minigroups" cannot be secured.

Almost every factory has its own spare parts store. The stores with a few exceptions are well ordered but because of the poor documentative base, the high values on stock and lenghtening idle time of machinery, there are some doubts even in the management's opinion, whether the fast turning items are on stock and the composition of spare parts is correct.

Transport

Each transport branch has its own firm /or firms/ for repair and maintenance purpose. The symptoms of these firms can be considered as the same mentioned above at the industry but it may be stated that the capacity of these firms taking into account the volume of the registered transport park /see table 3 and appendix "C"/, and the economical limit of self supporting in producing replacement for worn out parts, only at the railways is satisfactory. In the case of road transport the number of vehicles in comparison with the capacity of existing service stations and other repair facilities is high and

generally near to 40 % of the total park is out of work due to the lack of proper establishments.

It should be mentioned here that the Authorities of Transport dispose of a considerable volume of road construction machinery, whereas the repair and maintenance of these equipment is up to now by far not secured.

Agriculture

The existing repair and maintenance capacities for agriculture machinery are below the required limit, especially if the irrigation pumps and similar equipments of Ministry of Municipal and Rural Affairs are taken into account. The small-scale private industry mentioned above can satisfy neither in capacity nor in special machinery the demands. Here one should consider the distances among the cultivated districts and these private trades as a major disadvantage.

At present three state owned machine stations the Skelbich Station in western district, the Kameshly and Managir Station in Deir er Zor district are near to completion. These stations shall cover the present repair requirements of state-owned machinery.

b/ On regional or industrial level

There are no central repair workshops and spare parts stores on industrial or regional level even in the case of bigger enterprises having more than one factory. The exceptions are the Transport and Agriculture sectors. The repair and maintenance facilities of these sectors are discussed above under point a.

c/ Availability of spare parts

For the time being the majority of spare parts requirement is covered by importation /see table 6

and appendix "C"/. There are no extraordinary difficulties or restrictions concerning importation of spare parts with the exception of the boycotted firms, normally to get a new spare parts shipment for a state owned Firm takes about six months. Here should be mentioned that sometimes the shortage of foreign currency limits the importation. The shortage of foreign currency hits primarily the private dealers of technical goods, the nearly sole distributors of fast turning items for vehicles and some other industries. In the opinion of Personalities contacted during visits the trade reserves are decreasing, but immediate danger is not threatening. The State owned Importer SIMEX has not yet taken over these trades.

One may consider that the quantity and value of spare parts in stock in every factory and enterprise is much more than the total consumption for one year /see appendix "C"/. The main reason of this may occur on one hand of political situation and on the other hand of the lack of well founded spare parts policy /see point II/1 b/.

Finally it can be concluded that in general there is no serious shortage of spare parts in the S.A.R.

d/ Availability of spare parts manufacturing facilities

As it is outlined previously there are no spare parts manufacturing facilities of reasonable size in the S.A.R.

At present the railways is the only more or less self supporting firm producing its own spare parts and replacement of worn out machine parts besides some special items and normal commercial goods. The other firms cover their requirements mainly from importation and are anxious to develop their own manufacturing capacity /see point 1 b/. The production

of small-scale industries compared with the total consumption of the main sectors can be neglected.

The quality of locally made spare parts is in general below the requirements and can be considered as of second rate. Therefore these parts are mainly used for inferior purpose.

e/ Availability of organized stores

As it was concluded above every firm has its own spare parts store. The description and symptoms of these stores can be seen in point 1/b.

It should be mentioned that there are no central spare part stores organized on regional or industrial level. However in some industries especially in Textile and Cement the advantage of central stores would be obvious.

3. Prevailing conditions of repair and maintenance

a/ Standard of repair and maintenance

In general the standard of repair and maintenance activity is low. It may be stated that with the exception of the railway-rolling stock and power plants where periodical supervision of equipments are a matter of vital importance there exists no properly scheduled and executed preventive maintenance. One may consider the situation as not necessarily the outcome of the lack of properly equipped physical repair and maintenance facilities, absence of machine industrial background shortage of skilled manpower and in some extent the result of obsolete worn out machinery which is not worth overhauling. It is mainly the result of not suitably organized maintenance sections, spare parts supply, missing spare parts specifications and inventories. In the team's opinion the lack of

maintenance-minded management in the majority of visited firms and in some extent on industrial level is one of the main reason of this inadequacy. From the point of view of different fields of industry the following sequence may be established: /for details see table 6 and appendix "C"/.

| Class | Denom. of Industries | Standard of repair and maintenance |
|-------|--|------------------------------------|
| I | Central Power Plants State Railways | Satisfactory |
| II | Petrol Industry Textile Industry Vegetable Oil and Food Industry Cement Industry | Adequate |
| III | Road transport park Heavy construction machinery Agricultural machinery and machinery of Municipal Authorities | Unsatisfactory |

The base of classification was as follows:

- Group I. Preventive maintenance. Repairs are carried out according to programmes on the base of effective machine hours or other units, and scheduled supervisions, theoretically before a major deterioration is taken place in the condition of machine. A cycle generally consists of one general - two major overhaul few small repairs and supervisions. Spare part stores and supply is well organized, the necessary spares and replacements are at disposal for the scheduled overhauls. Production loss due to insufficient maintenance is low. The average idle time is below 10% or other predesigned limit.
- Group II. Operational maintenance. The characteristic features are similar to the preventive maintenance, that is the maintenance is based on periodical supervisions but the overhauls are not preceding the deterioration of machine, but follow it. The scale of overhaul generally depends on the state of machine. The correct preparation for a quick overhaul is more difficult. For sake of simpler handling those firms are accounted in this group too, where the schedules of preventing maintenance are prepared but the proper conditions to carry out the schedules are not secured. The average idle time is near to 15%.
- Group III. Emergency repair. Activity is mainly restricted to repair after breakdown. In most cases proper maintenance facilities and spare parts stores are not available. The production loss is very high. The average idle time is more than 15%.

Note: The average idle time in group II. and III. was evaluated because the necessary statistics in the visited firms had not been available .

The mentioned idle time limits for Transportation Firms were increased by 10 % in each group.

- b. Industries or industrial equipment in which the problem of repair and maintenance is particularly acute.

It can be stated on the base of previous points that the problem of repair and maintenance is particularly acute on the field of:

- road transport park,
- heavy construction machinery,
- agricultural machinery,
- machinery of Municipal Authorities,

- c-f. Factors affecting the adequacy of repair and maintenance facilities

As it has been outlined to some extent in previous paragraphs the following factors are affecting the adequacy of repair and maintenance. The sequence outlined below - in the opinion of the team - is identical with impact and significance of each symptom.

- Shortage in qualified personnel both in skilled workers and middle levelled executives. The "maintenance minded" executives on managerial level are very rare.
- The number of properly functioning maintenance departments is small. The spare parts inventories are missing or not properly filled up.
- Lack of machine industry and satisfactorily out-filled central repair and machining shops on regional level.
- The quality of locally produced spare parts and replacements are below the satisfactory level.

- Shortage in the capacity of servicing agricultural machinery and road transport equipment
- lack of Government or Private Institution[†] and coordinated Government policies dealing with repair and maintenance of industrial equipment.

Moreover the above mentioned, lack of standards both in the firms and on national level cannot be excluded from among the major influences effecting the repair and maintenance. However in the opinion of the team some discussion and conclusion in this subject run over the aims and limit of present Report.

4. Personnel

a/ Availability of skilled personnel

This seems to be the most serious problem.

Skilled workers

Both in production and maintenance the rate of skilled manpower compared to the total number of workers is generally under 10 % with the exception of Aleppo area where this rate is near to 40 % /see table 6/. Only the Railways and the PTT /Postal Telegraph and Telecommunication/ have apprentice training system. Here one should consider that with the above mentioned exceptions the apprentice training system is unknown and the skill of labourers based on experience rather than theoretical craftsmanship. This includes if a working problem is deviating from the normal routing the difficulties are multiplying.

† Note: In the opinion of the team the lack of this kind of Institute at present state of Industry in S.A.R. can be neglected.

Mid-levelled executives

The number of technicians and high technicians both in production and maintenance is below the necessary limit. Therefore no adequate number of mid-levelled executive is between engineer and worker.

Managerial level

Although only the base of an adequate repair and maintenance organization consisting of responsible manager and more or less developed staff has been existing in the majority of visited firms /see point 1 a/, one of the main problems is the missing of "maintenance minded" executives on managerial level. It is unfortunate that no course exists for improving the technical and managerial skill of the leaders in organizing repair and maintenance.

A list of personnel with experience on repair and maintenance met by the team during visits is enclosed in table 10.

b/ Availability of training facilities

There are two training centers for the physical workers, one in Damascus and one in Aleppo. In these centers there are courses of 6 months and 1 year period for practising workers on the textile, machinery /cutters/ smithery, motor mechanics welding and electrician trade.

The "productivity" of the Training Centers is low due to the lack of teachers and experience. For example accordingly the collected informations the capacity of Aleppo Center is near 400/year but at present it has only 100 students. There are no branches for training of mechanics or machine fitters in any of these training centers.

Besides the above-mentioned two Training Centers the PTT /Post Telegram Telecommunication Office/ has

its own apprentice school on the field of special electronics and telecommunication.

There exist other secondary industrial schools but without any practical training facilities.

On high school level there exist the Technical University in Aleppo and the Technological Institute of Damascus. It is unfortunate that the maintenance as a subject of instruction does not exist in neither of them.

III. Recommendations

The recommendations and programme outlined below follow the sequence of items stipulated in the contract in paragraph III/5-6 of annex "A". If more items are drawn together under one heading the referring letter used for each item is indicated.

Under heading "Future Policy" the team is summing up the steps thought necessary for improving the present situation with priorities within each points if necessary and under heading "Suggested Programme of Implementation" indicates the proposed sequence of realization.

1. Future Policy

a/ Survey of maintenance and repair needs

It is necessary to carry out

- a survey for finding out the total demand of skilled workers and technicians in Syria on the different industries, transportation and farming equipment
- a survey for detailed analysis on spare parts and repair requirements to determine the required capacity and production program of the machining and repair centers and central spare part stores are to be established /see point d/.
- a survey on the required number of new service stations for road transportation and farming equipment and on their location.

b/ Recommendation on the up-grading of existing facilities

To upgrading the existing facilities is necessary to develop the casting house of the Syrian Arab Railways in Aleppo for an up-to-date foundry for ferrous and non-ferrous metal casting.

c,g Setting up new facilities.

Setting up regional Machining and Repair centers

To reduce the effect of the lack of machine industry the team suggests to set up two regional machining and repair centers. One center is to be established in Aleppo, the other in Damascus area. The production programme and size of this new establishments should be based on spare parts inventories and evaluations set up by the survey mentioned above /see paragraph a/.

The team is convinced that the expenditure of this investment would be repaid by savings in spare parts on stock.

Setting up new service stations for road transport

To solve the problem of proper repair and maintenance of cars, trucks, heavy construction machinery and farming equipment new service stations are to be established. The capacities, the locations, and other specific data of these stations are to be based on the result of a special survey. As for the pump sets according to the team's suggestion two mobil units are to be obtained as an emergency aid.

Setting up a central foundry

To solve the problem of "minifoundries" and to produce reliable quality a foundry is to be established. The location and production programme of this foundry has to determine in connection with the Machining and Repair Centers mentioned above.

To improve the standard of maintenance

In the opinion of the team to improve the standard of

maintenance of factories or enterprises, experts are to be sent into each significant factories or enterprises of industries /see in table 7/ for helping the firm in organizing a preventive maintenance system and a well founded spare parts policy based on inventories. The duration of this mission would be a period of 2-5 months in each firm, depending on size.

d,f/ Recommendations on improving existing stores storage systems and the establishment of new ones.

To improve the composition of spare parts on stock and for organizing a well founded spare part policy and storage system experts are to be sent in to factories mentioned /see in table 7/.

For the textile and cement industries central spare parts stores are to be established on regional level, according the results of previously outlined surveys.

e/ Required training

Skilled workers. The problem has to be approached from two directions. It is necessary on one hand to raise the theoretical and technical skill of workers already working in different industries by organizing short-period courses in factories either on territorial base or successively in each firm, and on the other hand by creating a real apprentice training system to satisfy the continuous skilled manpower requirement the developing industry. To start with the realization the existing and unutilized training centers in Damascus and in Aleppo should be used. The pupils of these professional schools should be recruited, from the graduates of normal schools, instead of the present practice from among practising workers. The above mentioned survey /see point a/ would answer the question whether it is worth to establish a new training center /or training centers/ in Damascus or

in Aleppo to satisfy the demands and for mechanics and machine fitters to fulfil the special needs of repair and maintenance.

Mid-levelled executives. In the team's opinion the present capacity of the existing Technological Institute could not cover the total demand of this kind of graduates. Therefore in connection with the above mentioned survey the yearly requirement of high technicians is to be found out and accordingly the result must decide the extension of the existing Institute or building a new one.

On Managerial level. To improve "maintenance mindedness" of factory management high degree courses are to be organized under the aegis of "Management Development and Productivity Center" either in the Technological Institute in Damascus or in the Technical University of Aleppo.

h/ The role that can be played by developing countries and mother factories

The help of developed countries could be useful:

- in sending experts for surveys and organising work outlined above,
- in delivery of plans and equipments for the rehabilitation and extension of the casting house of the Syrian Railways in Aleppo
- in delivery of plans and equipment for the new Machining and Repair Centers are to be established
- in establishing of specialized service stations for road transportation, heavy construction and farming equipment.

2. Suggested programme of implementation

a/ Short term programme for two years period

On the base of previous paragraph the team suggests in the sequence of priorities the followings:

1/ To send five teachers to Aleppo and five in Damascus in the existing training centers to make sure that these centers are fully used.

The teachers must have experience in cutting, welding, textile electric and casting trades.

2/ To send two experts for organizing high degree courses for managements with the aid of Management and Productivity Center either in the Technical University of Aleppo or in the Technological Institute of Damascus concerning repair and maintenance.

3/ To send ten experts two by two successively to each factory listed on table 7, for a period of 2-5 months, for organizing and initiating the preventive maintenance and adequate spare parts store.

4/ To supply two mobile service stations for pumps and irrigation plants as emergency aid

5/ To send teams to carry out:

- a survey on the demand of skilled workers and technicians for the Industry transportation and farming equipment to make suggestions of existing training facilities and for new ones. /Two experts for half a year period/
- a survey on the required quantity of spare parts and repair needs to make suggestions for setting up regional machining and repair centers, central foundry and spare parts stores /Four experts for one year period/
- a survey with suggestions on service needs of road transportation, construction and farming equipment /Two experts for half a year period/.

Note: the experts mentioned above should be international.

b/ Long term programme for five years period or more according to the needs

- 1/ To organize short period vocational courses for mechanics and mid-levelled executives in the central workshops of Hedjas Railways in Damascus and Syrian Railways in Aleppo and in Petrole refinery of Homs.
- 2/ To carry out the necessary extension and modernization in the casting house of Syrian Railways in Aleppo
- 3/ To carry out the required reorganization and extensions on the apprentice and training system of S.A.R. according to the suggestions of the mentioned survey.
- 4/ To set up machinery and repair centers in Aleppo and Damascus, the central foundry and spare parts stores according the result of mentioned survey
- 5/ To establish new service stations for road transportation, construction and farming equipment according to the needs and suggestions of previous survey.

3. Proposed schedule for short and long-term programmes

1. Upgrading the utilization of existing training centers

Organizing high degree courses

Organizing preventive maintenance

Obtain new Mobil Units

To carry out surveys

- on demand of skilled workers and technicians

- on quantity of spares and repair needs

- on service needs

Organizing short period courses

Carrying out extension in the casting house of Syrian Railways in Aleppo

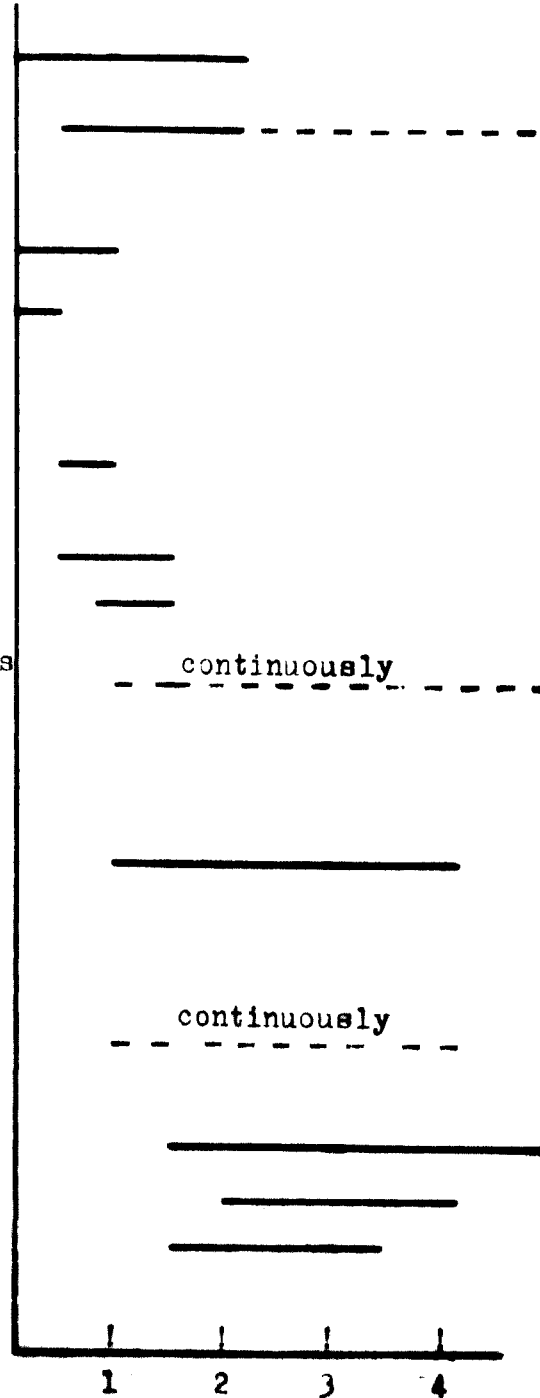
Carrying out reorganization in the apprentice and training system

To set up

- machining and repair centers

- central spare parts stores

- new service stations



A p p e n d i x "A"

Appendix "A"

Scheduled Programme of Visits in the
Syrian Arab Republic

Damascus

12. January Ministry of Industry
- Textiles /Debs/ and Sugar /Adra/ Public Sector
13. January Ministry of Industry
- Visit to the Cement Plant /Doumar/
Ministry of Communications
- Visit to the Workshop for Road Building and Transport Repair
14. January Ministry of Communications
- Hedjaz Railways /Kadam/
- El-Djin District for Repair of Transport and Agricultural Machinery Service /Private Sector/
- Signal Repair Centre /Harasta/
- PTT Telecommunication Station for repair
15. January Ministry of Oil, Electricity and Executing Industrial Projects
- The General Electricity Establishment /Rural Electricity/ and others.
16. January Ministry of Municipal and Rural Affairs
- The Transport Station
- The Municipal Equipment Station
- Mobile Unit for Pumps Repair

Homs

18. January Ministry of Industry /Public Sector/
- Homs Sugar Plant
- Homs /Hama Cement Plant

19. January Ministry of Industry /Public Sector/
- Dyeing Technical Plant
Ministry of Oil, Electricity and Executing Industrial Projects
- The Homs Oil Refinery
20. January Ministry of Oil, Electricity and Executing Industrial Projects
- The Electricity Station
- The Oil Station and others

Hama

21. January Ministry of Agriculture and Agrarian Reform
- Skelbich Station for Agricultural Equipment

Aleppo

22. January Ministry of Oil, Electricity and Executing Industrial Projects
- The Electricity of Aleppo and others
23. January Ministry of Municipal and Rural Affairs
- The Municipal Centre
- The Transport Centre
- The Mobile Unit for Pumps Repair
- Agricultural and Agrarian Reform Centre

Kamashli

25. January Ministry of Agriculture and Agrarian Reform
- Kamashli and Managir Stations
26. January Return to Aleppo

Algeria

27. January Ministry of Industry /Public Sector/
- Al Shaba Textile Plant
 - The Oil Vegetable Plant
 - Industrial Training Center
28. January Ministry of Industry /Public Sector/
- Cement Factory
- Ministry of Communications
- Workshop for Road Building and Transport Repair
29. January Ministry of Communications
- The Syrian Railways
30. January Ministry of Communications
- Boustan Gul-Ab and Al-Midan Districts for transport and agricultural equipment services /private sector/.

Damascus

1. February Technological Institute
- 3-5 February
- Ministry of Planning
 - Directorate of Statistics
 - Management Development and Productivity Center
 - SADCOP of the Ministry of Oil.

A p p e n d i x B

Tables 1-10

Table 1.

**Sectoral Structure of Gross Output
and National Income of 1964.**

| Denomination | 1964 | |
|-----------------------------|----------------|-----------------|
| | % of the total | |
| | Output | National Income |
| Agriculture + | 25,7 | 11,7 |
| Industry + | 24,7 | 32,9 |
| Construction | 5,5 | 3,3 |
| Transport and Communication | 8,7 | 7,3 |
| Wholesale and retail trade | 13,5 | 14,1 |
| Banking and Insurance | 2,2 | 2,9 |
| Ownership of dwellings | 5,3 | 8,1 |
| Public Administration | 10,1 | 11,1 |
| Services | 5,5 | 6,9 |
| External Transactions | 0,2 | 0,3 |
| Total | 100,0 | 100,0 |

Source: Directorate of Statistics and Ministry of
Planning /Five years plan/

+ Note: The sequence of these two sectors deviate from the original table published by the Directorate of Statistics. The correction has taken place on the base of other corresponding data in the same statistical Abstracts.

Table 2.

**Number of persons employed and
number of establishments in the manufacturing
industry**

| Major group of industries | No. of estab- lish- ments | No. of persons in rounded figures | No. of estab- lish- ments visi- ted | No. of persons of vi- sited est. in rounded figures |
|------------------------------|------------------------------------|---|--|---|
| Spinning and weaving | ^x 2024 | 18970 | 3 | 3200 |
| Engineering ind. electricity | 558 | 9830 | 5 | 300 |
| Chemicals | 347 | 7400 | 4 | 1200 |
| Foodstuffs | 1412 | 12500 | 3 | 2100 |
| Petrol | 1 | 700 | 1 | 700 |
| Transport and Communication | 13 | 2660 | 4 | 1000 |
| Agriculture and Municipal | not available | | | |

^x 70 % Capacity of the total industry
is concentrated in 9 establishments

Source: Directorate of Statistics

Table 3.

Number of various Vehicles in Syria
/1966/

| | | |
|-------------------------|--------------|-------|
| Passenger cars | 26 196 | units |
| Buses | 1 613 | " |
| Trucks | 7 241 | " |
| Pick-up cars | 4 734 | " |
| Tankers | 764 | " |
| Landrovers | 471 | " |
| Pick-ups Motor Vehicles | 267 | " |
| Motorcycles | <u>5 054</u> | " |
| | 46 340 | pcs |

Railway Rolling stock
/1966/

| | | |
|----------------------------|------|-------|
| Automotrices /motor trains | 7 | units |
| Locomotives | 71 | " |
| Passenger Vehichles | 112 | " |
| Goods wagons | 1440 | " |
| Fuel wagons | 132 | " |
| Other wagons | 54 | " |

Source: Directorate of Statistics

Table 4.

**Number of Agricultural Machines
registered of the end of 1966. by Country of origin**

| | Tractors nos. | Combined Harvesters nos. |
|-----------------|------------------|-----------------------------|
| United Kingdom | 7874 | 116 |
| USA | 2301 | 1172 |
| Germany | 607 | 17 |
| Italy | 382 | 3 |
| Canada | 178 | 344 |
| East Countries | 811 | 14 |
| Sweden | 489 | 18 |
| France | 112 | - |
| Belgium | - | 212 |
| Other countries | 39 | 3 |

Source: Directorate of Statistics

Table 5.a

**Relative contribution of industry
and other sectors to export**

| | 1964 | | 1963 | |
|---|---------------------|----------|-------|----------|
| | % of total value | quantity | value | quantity |
| Export of finished production | 11,2 | 6,2 | 9,5 | 5,9 |
| Export of raw material and semi finished production | 63,9 | 37,9 | 64,9 | 35,0 |
| Export of food stuff | 24,9 | 55,9 | 25,6 | 59,1 |
| | 100,0 | 100,0 | 100,0 | 100,0 |
| total export in value mKS | | 673,0 | | 621,0 |
| total export in quantity 1000 t | | 996,0 | | 1260,0 |

Source: Directorate of Statistics

Table 5b

The relative importance of exports for 1966

Value: thousand Syrian Pounds
Quantity: Ton

| Sort of Export | Exports | | The percentage of the value of each kind of export, to total value of exports |
|-----------------------------------|----------------|----------------|---|
| | Value | Quantity | |
| Cotton and other kinds of textile | 413,940 | 194,698 | 63 % |
| Food Industry | 43,841 | 135,872 | 7 % |
| Other products and industries | 203,609 | 317,495 | 30 % |
| Total | 661,390 | 647,865 | 100 % |

Notes:

1. Value of exports of cotton represents 64 % of the total value of exports
2. Other industries include many divisions as: living animals, animal products, botanical products, mineral products, petrole industry, products of chemical industries and other materials for Source Directorate of Statistics

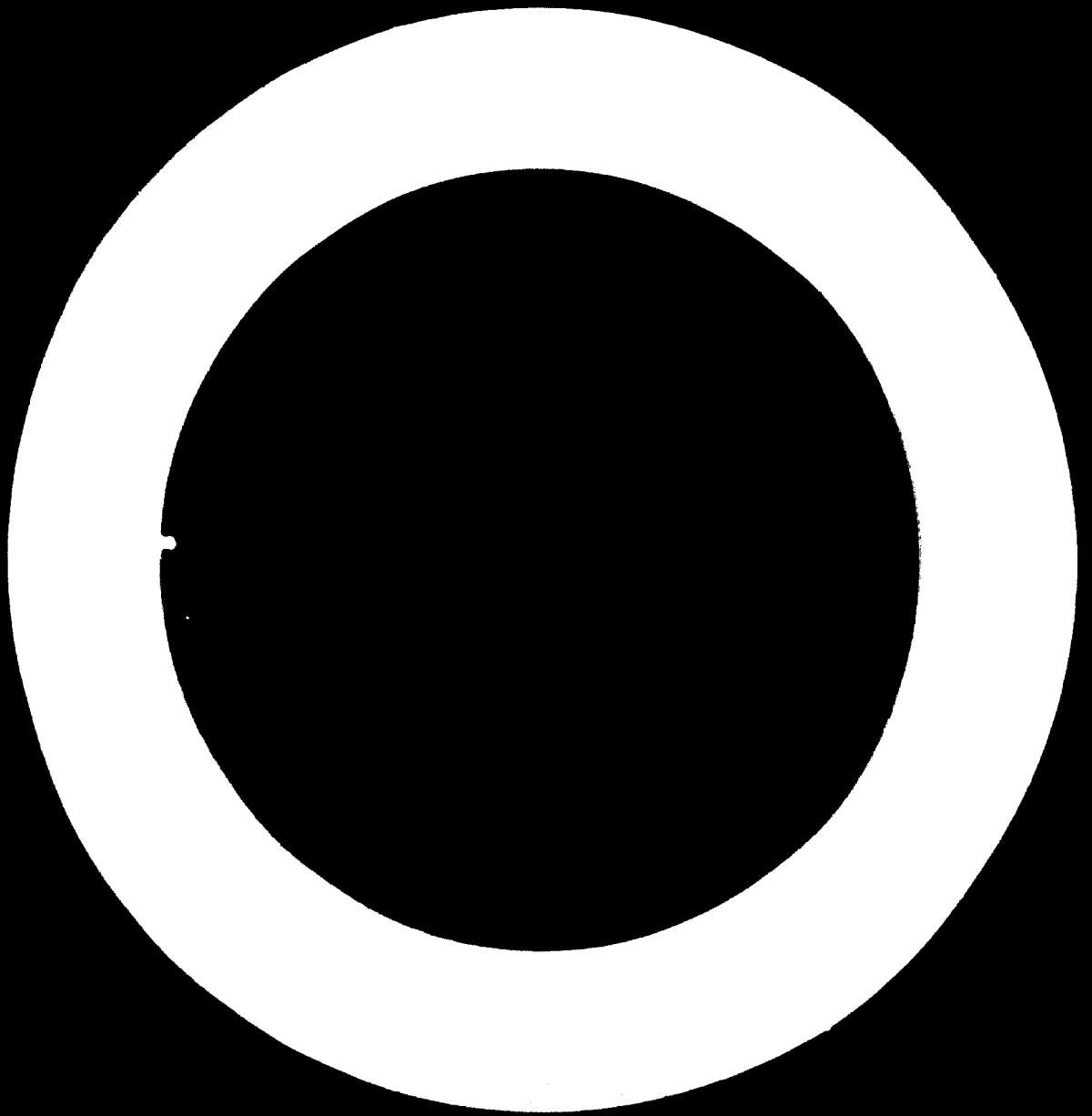


Table 6. Classification of Repair and Maintenance Services in the visited Enterprises and Industries

| I t e m | Denomination of firms | No. of total emplo- yee | From the total | | Maintenance Services | | Character of maintenance | | | Standard of maintenance | | Separate maintenance shop | | Spare part store | | Imported spare part % | Remark | |
|------------------|----------------------------------|----------------------------------|----------------|--|--|--|-----------------------------|----------------------------|---|------------------------------------|-------|---------------------------------|-------|---------------------|------------------|--------------------------------|--------|--|
| | | | Engi- neers | Skilled workers as % of total employee | Eng. No. of total emplo- yee | Skilled workers as % of total mainte- nance | pre-ope- ven- nal | emer- ra- gen- cy | sa- accep- tis table fac- tory | un- sa- tis- fac- tory | exist | don't exist | exist | don't exist | /estima- ted/ | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1 | Textiles Debs | 840 | 5 | 6 | 2 | 20 | | + | | | + | | + | | + | | 70 | The maintenance is at a very low level. It is urgent to organize the preventive maintenance. |
| 2 | Textiles Dying and Printing Co. | 912 | 4 | 3 | 2 | 26 | | + | | | | + | + | | + | | 80 | The maintenance is not sufficient. It is urgent to organize the preventive maintenance. |
| 3 | Shaba Textile Co. | 1100 | 2 | 80 | 1 | 83 | | + | | | + | | + | | + | | 70 | The factory do not need, an urgent help but with the help of an expert in short time could be organized the preventive maintenance. |
| 4 | Cement Plant of Damaskus | 320 | 3 | 8 | 1 | 40 | | + | | | + | | + | | + | | 70 | The maintenance is functioning well. The spare part stock is excessive. |
| 5 | Cement Plant of Homs | 258 | 4 | 4 | 1 | 19 | | + | | | + | | + | | + | | 70 | The spare part stock is excessive. |
| 6 | Cement Plant of Aleppo | 480 | 5 | 17 | 2 | 87 | | + | | + | | | + | | + | | 70 | Because of the excessive spare part stocks it would be important to organize a central spare part store for the Cement Plant in Syria, with it would be possible to reduce the volume. |
| 7 | Diesel Power Station of Damaskus | 130 only for maintenance | | | 4 | 60 | | + | | + | | | + | | + | | 90 | |
| 8 | Steam Power Station of Hamleh | 13 | 3 | 76 | 3 | 76 | | + | | + | | | + | | + | | 85 | The maintenance is satisfactory |
| 9 | Steam Power Station of Homs | 38 | 7 | 45 | 7 | 45 | | + | | + | | | + | | + | | 85 | |
| 10 | Diesel Power Station of Aleppo | 30 | 4 | 47 | 4 | 47 | | + | | + | | | + | | + | | 85 | |
| 11 | Diesel Power Station of Al Kabun | 20 | 3 | 47 | 3 | 47 | | + | | + | | | + | | + | | 90 | |
| 12 | Bus repair station of Aleppo | 150 | 2 | 20 | 2 | 20 | | + | | + | | | + | | + | | 85 | |
| 13 | Repair Centre of Aleppo | 71 | 1 | 21 | 1 | 21 | | | + | | | + | + | | + | | 100 | Neither the level of maintenance, nor the spare part store is satisfactory. It is urgent need to organize both of them. |

| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
|---|------|----|----|----|-----|---|---|----|----|----|----|----|----|----|----|----|-----|--|
| 14 Workshop for Road Building and Transport Repair of Aleppo | 30 | - | 35 | - | 35 | | + | | | + | | + | | | + | | 90 | It is urgent to establish spare part store |
| 15 The Transport Station of Damascus | 44 | - | 4 | - | 10 | | | + | | | + | + | | | + | | 100 | The level of maintenance is very low |
| 16 The Municipal Equipment Station of Damaskus | 121 | 2 | 8 | 2 | 8 | | | + | | | + | + | | | + | | 100 | It is a very big problem to maintain all the different types of machines in the same work shop |
| 17 The Syrian Railwais | 372 | 22 | 43 | 22 | 43 | | + | | | + | | + | | | + | | 50 | It is a well organized shop but the average age of the machines is too old and of data |
| 18 Hed. as Railwais | 275 | 9 | 60 | 10 | 5 | | + | | | + | | + | | | + | | 40 | |
| 19 Private Sector for repair of transport and Agricultural Machinery Service of Damaskus and Aleppo | | | | | | | | | | | | | | | | | | There are well equipped small workshops approx 600 each with 10 workers in average |
| 20 Skelbich Station for Agricultural Equipment | 50 | 1 | 64 | 1 | 64 | | | | | | | + | | | + | | 100 | It was just recently established. There is no experience yet. |
| 21 Kameshli Station for Agricultural Equipment | | | | | | | | | | | | + | | | + | | | The station has not started yet with the regular work, so no data were available |
| 22 SADCOP airport service of Damaskus | 5 | - | 80 | - | 100 | | + | | | + | | + | | | + | | 100 | It is a well organized workshop |
| 23 SADCOP pum. rep. station of Damaskus | 39 | - | 20 | - | 23 | | + | | | + | | + | | | + | | 100 | It is a well organized workshop but the rate of skilled workers is unsatisfactory |
| 24 Vegetable Oil Plant of Aleppo | 1200 | 9 | 17 | 3 | 20 | | + | | | + | | + | | | + | | 90 | The maintenance is well organized |
| 25 Sugar Plant Adra | 900 | 4 | 45 | 1 | 42 | | + | | | | + | + | | | + | | 80 | In the near future they will start with the preventive maintenance |

Table 6. Page 3:

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
|---|-----|----|----|---|----|---|---|---|----|----|----|----|----|----|----|----|----|-----|---|
| 26 Sugar Plant of Homs | 871 | 12 | 45 | 1 | 23 | | + | | | | + | + | | | + | | | 76 | The spare part supply must be urgently organized |
| 27 The Oil Refinery | | | | 4 | 29 | | + | | + | | + | | | | + | | | 96 | The maintenance is nearly preventive it is under reorganization |
| Some branches of Industries Transport and Communication Motorized vehicles | | | | | | | | | + | | + | | + | | | | + | 90 | The maintenance is done mainly in the small private workshops |
| Railroad | | | | | | | + | | | + | | + | | | | | + | 60 | The maintenance of the railroad rollingstock and the aircraft is satisfactory but the rolling stock is very old |
| Air Transport | | | | | | | + | | | + | | + | | | | | + | 100 | |
| Heavy Road Building and construction machinery | | | | | | | | | + | | + | | + | | | | + | 100 | |
| PTT | | | | | | | + | | | + | | + | | | | | + | 100 | The maintenance of PTT equipment is satisfactory |

Table 7.

Priorities of enterprises

/Since the team saw only a small part of the establishments, the sequence has to be consulted naturally with the local organs and their proposal has to be considered/.

1. SHABA Textil Co.
2. Textiles DEBS
3. Textiles Dyeing and Printing Co.
4. SKELBICH Station for Agricultural Equipment
5. KAMESHLI Station for Agricultural Equipment
6. Managair Station for Agricultural Equipment
7. Cement Plant of Damascus
8. Cement Plant of HOMS
9. Cement Plant of ALEPPO
10. Bus repair station of ALEPPO
11. Repair centre of ALEPPO
12. The Transport Station of Damascus
13. Workshop for Road Building and Transport Repair of ALEPPO
14. Sugar Plant ADRA
15. Sugar Plant of HOMS
16. The Oil Refinery

Table 8.

Some important industrial establishments in Syria, their products and the number of their workers for 1966

| Name of the Establishment | Industry | Date of establishment | No. of workers | Quantity of production in tons |
|---|----------|-----------------------|----------------|--------------------------------|
| United Industrial Commercial Company /Al-Khummassieh/ | Textile | 1946 | 3346 | 12527 |
| Spinning and Weaving Company | " | 30.8.1937 | 1860 | 17632 |
| Syrian Company for Spinning and Weaving | " | 18.1.1933 | 1810 | 7811 |
| Al Shahba'company for Spinning and Weaving | " | 29.3.1949 | 1069 | .9317 |

Source: Directorate of Statistics

Table 9.

Labour force by sections of main
activity in the Syrian Arab Republic
May 1966

| Item | Labour force |
|---|------------------|
| Agriculture and hunting | 837 586 |
| Mining and quarrying | 4 787 |
| Manufacturing | 136 230 |
| Building and construction | 76 583 |
| Electricity gas, water and sanitary services | 11 727 |
| Commerce | 125 145 |
| Transport communication and storage | 45 267 |
| Services | 169 020 |
| Activities not adequately described | 22 120 |
| Total | <u>1 448 465</u> |

Source: Directorate of Statistics

Table 10.

List of personnel with experience
met during the visits to factories

Persons of the Ministry of
Communications

| | |
|-------------------------|-------------|
| Eng. Faez Kachkoul | Damascus |
| Eng. Ihsan Chamie | " |
| Eng. Naim Dabbous | " |
| Eng. Mohammad Bachir | " |
| Eng. Abdul Baset Tarcha | Homs |
| Eng. Riad Razzaz | Hama |
| Eng. Manolli Papadokis | Idleb |
| Eng. Kervok Kaladjian | Aleppo |
| Eng. Hossep Michael | " |
| Eng. Krikor Aroche | " |
| Eng. Agop Tarkhanian | Raqqa |
| Eng. Faric Omar | Dier ez Zor |

Ministry of Municipal and Rural Affairs

| | |
|-----------------------|-------------------------|
| Eng. Mouzaffar Shaben | Aleppo Transport Centre |
|-----------------------|-------------------------|

Ministry of Oil, Electricity and Executing Industrial
Projects

| | |
|-------------------------|----------------------------|
| Eng. Faik Ashari | Homs Oil Refinery |
| Eng. Abu Zummar | " |
| Eng. Nasib Atassi | " |
| Eng. Mousse Khalifallah | Homs Thermic Power Station |
| Eng. Walid Rihaoui | Aleppo " |
| Eng. Mohamad Ossman | Alappo " |

Ministry of Industry

Eng. Aman Kabbani
Eng. Nizar Sibai
Eng. Ibrahim Hajunood
Eng. Hamed Moderess
Eng. Khalili
Eng. Kabbaze
Eng. Martini

Homs Sugar Plant
Homs Dying Technical Plant
Aleppo Al-Shahba Textil
-"-
Aleppo Oil Vegetable Plant
-"-
-"-

Ministry of Agriculture

Eng. Chamoun Mourad

Ministry of Agriculture Damascus

Appendix "C"

Summary data on the firms
visited by the team

Denomination of firms: 1. Textiles Debs
Damascus, established in 1933

Production: dress material

Total employment: 840

of which engineers or technicians: 5

manual workers: 800

of which skilled workers: 50

Independent maintenance shop exists, acceptable

Engineers or technicians in the maintenance: 2 /satisfactory.

Maintenance workers: 40 /sufficient/

There among the maintenance workers are: 8

skilled workers /unsatisfactory/

Spare parts store exists and it is well ordered

Est. spare parts stock for: 3 years /excessive/

Imported spare parts

amount to 70 % of total

Number of machines and equipments needing

maintenance: 200 weaving looms 1600 spindles

Number of machines in the central maintenance

workshop: 9 /acceptable/

Short description:

The factory is working in three shifts. approx. 20 % of the machines is standing. A maintenance organization is existing. They are working with an operational system. They have no inventory of the floating equipments. The spare parts stock is well-ordered. The stock is excessive. The origin of the machinery is international, it is not unified, there are too many types. The level of the maintenance is just acceptable. The machines are mostly out of date, the production is low. The factory needs urgent help for organizing the preventive maintenance.

Denomination of firms: 2. Textiles Dyeing and Printing Co.
Homs established in 1946

Production: dyed textiles and
dress material

Total employment: 912
of which engineers or technicians
manual workers: 900
of which skilled workers: 23

Independent maintenance shop exists, it is unacceptable.
Engineers or technicians in the maintenance: 2 /unsatisfactory/
Maintenance workers: 50 /satisfactory/
There among the maintenance workers are: 13
Skilled workers /unsatisfactory/

Spare parts store exists and it is well ordered.
Est. spare parts stock in value for 2 years satisfactory
Imported spare parts: amount to 89 % of total
Number of machines and equipments needing
maintenance: 150 weaving looms, 5000 spindles
15 automatic printing machines
Number of machines in the central maintenance
workshop: 9 /satisfactory/

Short description:

The equipments of the factory are up to date, but the direction is weak. The maintenance is operational, but not sufficient. Especially the maintenance of the auxiliary equipments and buildings is neglected. The standstill of the machines is over 20 %. The factory needs urgent help for organizing the preventive maintenance.

Denomination of firms: 3. Shabe Textil Co.

Aleppo established in 1949.

Production: dress material

Total employment: 1100

of which engineers or technicians: 2

manual workers: 1040

of which skilled workers: 900

Independent maintenance shop exists, it is acceptable

Engineers in the maintenance: 1 /unsatisfactory/

Maintenance workers: 60 /satisfactory/

There among the maintenance workers are: 50

skilled workers: 50 /satisfactory/

Spare parts store exists and it is well ordered.

Est. spare parts stock in value for: 2 1/2 years estimated

/excessive/

Imported spare parts: amount to 80 % of total

Number of machines and equipments needing

maintenance: 247 weaving looms, 1150 spindles

Number of machines in the central maintenance

workshop: 5 /unsatisfactory/

Short description:

The factory is well organized. They are working in 3 shifts. The rate of skilled workers is strikingly good. The factory has got a good directed, well organized operational maintenance. The standstill of the machines is under 10 %. The spare parts stock is excessive. The machines are mixed. The factory dont need on urgent help but in a short time could be organized the preventive maintenance.

Denomination of firms: 4. Cement Plant of Damascus
Damascus /the date of establishment
is unknown/

Production: cement

Total employment: 320

of which engineers or technicians: 3

manual workers: 300

of which skilled workers: 25

Independent maintenance shop exists, it is acceptable

Engineers or technicians in the maintenance: 1 /unsatisfactory/

Maintenance workers: 40 /satisfactory/

There among the maintenance workers are: 15

skilled workers /acceptable/

Spare parts store exists and it is well ordered

Est. spare parts stock in value for: 2 year: /excessive/

Imported spare parts: amount to 70 % of total

Number of machines and equipments needing

maintenance: 2 units

Number of machines in the central maintenance

workshop: 7 /satisfactory/

Short description:

The plant is working in well organized 3 shifts. The equipments are of the F.G.R./ Federal German Republic/. The maintenance is operative, functioning well. The spare parts stock is excessive. A stock for 2 years is reasonable only of big casts, since these are available only abroad and the time of transportation is long.

It is necessary to organize a central spare parts store for all the Cement Plants in Syria.

Denomination of firms: 5. Cement Plant Homs
Homs, established in 1959

Production: Cement

Total employment: 258

of which engineers or technicians: 4

manual workers: 237

of which skilled workers: 10

Independent maintenance shop exists, it is acceptable

Engineers in the maintenance: 1 /unsatisfactory/

Maintenance workers: 42 /satisfactory/

There among the maintenance workers are: 8

Skilled workers /unsatisfactory/

Spare parts store exists and is well ordered

Est. spare parts stock in value for: 3-4 years /excessive/

Imported spare parts amount to: 80 % of total

Number of machines and equipments needing

maintenance: 1 unit /Kiln/

Number of machines in the central maintenance

workshop: 6 /satisfactory/

Short description:

The direction of the plant is good. It is working in 3 shifts. The maintenance is operational although at the main unit a repair is done only after a break down. The biggest problem is the lack of skilled workers. The spare parts stock is excessive. The equipments are from Federal German Republic.

It is necessary to organise a central spare parts store for all the Cement Plants in Syria.

Denomination of firms: 6. Cement Plant of Aleppo

Aleppo; Date of establishment unknown.

Production: Cement

Total employment: 480

of which engineers or technicians: 5

manual workers: 450

of which skilled workers: 80

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: 2 'acceptable/

Maintenance workers 75 /satisfactory/

There among the maintenance workers are: 65

skilled workers /satisfactory/

Spare parts store exists and it is well ordered

Estimated spare parts stock in value for: 3 years/excessive/

Imported spare parts amount to: 70 % of total

Number of machines and equipments needing

maintenance: 3 units

Number of machines in the central maintenance

workshop: 10 /satisfactory/

Short description:

As the other factories in the district of Aleppo, this one is also well organized and also the rate of skilled workers is rather good. The maintenance is preventive and is doing a good job. An inventory of spare parts is existing. The spare parts stock is here also excessive. The stock is well-ordered.

It is necessary to organize a central spare parts store for all the Cement Plants in Syria.

Denomination of firms: 7. Diesel Power Station at Damascus
Damascus. Date of establishment
unknown

Production: Nominal capacity 8 MW

Total employment: 130

of which engineers or technicians: 4

manual workers: 126

of which skilled workers: 80

Independent maintenance shop exists, it is satisfactory.

Engineers or technicians in the maintenance: 4 /satisfactory/

Maintenance workers: 126 /satisfactory/

There among the maintenance workers are: 80

Skilled workers /satisfactory/

Spare parts store exists and is well ordered.

Est. spare parts stock in value for: 3 years /excessive/

Imported spare parts amount to: 90 % of total

Number of machines and equipments needing
maintenance: 6 Diesel units of different types

1 Steam Power Plant of 45 kW

Number of machines in the central maintenance
workshop: 10 /acceptable/

Short description:

The workshop is well organized and has sufficient skilled workers. Apart the maintenance of above-mentioned equipments the workshop is doing machine working also for the other. Power stations in the district of Damascus. At the power stations is a well organized preventive maintenance. The workshop has got also a forging shop and a small casting house.

The equipments of the power station are delivered by the firms MAN, WORTHINGTON and FRANCO TOSSI.

Demonination of firms: 8. Steam Power Station of Hamleh
Hamleh

Date of establishment unknown

Production: Nominal capacity 45 MW

Total employment: 13 /for maintenance/

of which engineers or technicians: 3/satisfactory/

manual workers: 10/satisfactory /

of which skilled workers: 3/unsatisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and it is well ordered

Estimated spare part stock in value for: 3-5 years /excessive/

Imported spare parts amount to: 90 % of total

Number of machines and equipments needing

maintenance: 3 x 5 generator unit of 5 MW

Number of machines in the central maintenance

workshop: 5 /satisfactory/

Short description:

As described before, the power stations have got a well organized preventive maintenance. The necessary repairs can be carried out at the spot, except the general overhaul of the turbine. The equipments of the power station were delivered by the enterprises SIEMENS and BBC.

Denomination of firms: 9. Steam Power Station of Homs

Homs Date of establishment unknown

Production: Nominal capacity 90 MW

Total employment: 38 /for maintenance/

of which engineers or technicians: 7 /satisfactory/

manual workers: 30 /satisfactory/

of which skilled workers: 15 /satisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers "

Spare parts store exists and it is well ordered

Est. Spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amounts to: 85 % of total

Number of machines and equipments needing

maintenance: 2 generator units of 15 MW

2 " " " 30 MW

Number of machines in the central maintenance

workshop: 8 /satisfactor./

Short description:

The equipments of the power station are from the SKODA factory. As described before, the power stations have got a well organized preventive maintenance. The necessary repairings can be carried out on the spot, except the general overhaul of the turbine.

Denomination of firms: 10. Diesel Power Station of Aleppo
Aleppo. Date of establishment unknown.

Production: Nominal capacity 24 MW

Total employment: 30 /for maintenance/

of which engineers or technicians: 4 /satisfactory/

manual workers: 26 /satisfactory/

of which skilled workers: 12 /satisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and it is well ordered

Est. spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amounts to: 85% of total

Number of machines and equipments needing

maintenance: 6 generators units of 4 MW

Number of machines in the central maintenance

workshop: 6 /satisfactory/

Short description:

As described before, the power stations have got a well organized preventive maintenance. The necessary repairs can be carried out at the spot, except the general overhaul of the turbine. The equipment of the power station was delivered by the firms MAN and FRANCO-TOSSI.

Denomination of firms: 11. Diesel Power Station Al Kabum
Al Kabum. Date of establishment
unknown

Production: Nominal capacity 11 MW.

Total employment: 20 for maintenance

of which engineers or technicians: 3 /satisfactory/

manual workers: 17 /satisfactory/

of which skilled workers: 8 /satisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and well ordered

Est. spare parts stock in value for: 2 years /satisfactor/

Imported spare parts amounts to: 90 % of total

Number of machines and equipments needing

maintenance: 6 generators units of 2 MW

Number of machines in the central maintenance

workshop: 10 /satisfactory/

Short description:

As described before, the power stations have got a well organized preventive maintenance. The necessary repairing can be carried out at the spot, except the general overhaul of the turbine. At this power station are 6 generator units with smaller capacity and all the 6 are of different types.

Denomination of firms: 12. Bus Repair Station of Aleppo
Aleppo. Date of establishment unknown

Production:

Total employment: 150 for maintenance
of which engineers or technicians: 2 /unsatisfactory/
manual workers: 148 /satisfactory/
of which skilled workers: 30 /unsatisfactory/

Independent maintenance shop exists, it is acceptable
Engineers or technicians in the maintenance: see above
Maintenance workers: "
There among the maintenance workers are: "
skilled workers: "

Spare parts store exists and well ordered
Est. spare parts stock in value for: 1 year /satisfactory,
Imported spare parts amounts to: 85% of total
Number of machines and equipments needing
maintenance: 150 buses
10 tramways
Number of machines in the central maintenance
workshop: 10 /acceptable/

Short description:

It is the best organized of the big repair stations for maintenance of communication equipments. The buses starting into the traffic are daily checked and a periodical supervision is carried out, but only the noticed defects are repaired. 30 % of the vehicles was under repair. From this 15-20% was only a quick repair. The vehicles are relatively unified, they are GMC or MERCEDES cars.

The station has got a small casting house. The workshop including building and machinery is very old. Average age of the machines approx. 30 years. It is need for new machines.

Denomination of firms: 13. Repair Centre of Aleppo
Aleppo. Date of establishment unknown

Production:

Total employment: 71 for maintenance

of which engineers or technicians: 1 /unsatisfactory/
manual workers: 70 /satisfactory/
of which skilled workers: 13 /unsatisfactory/

Independent maintenance shop exists, it is unacceptable
Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists but it is unsatisfactory

Est. spare parts stock in value for: 1/4 year /unsatisfactory/

Imported spare parts amounts to: 100 % of total

Number of machines and equipments needing

maintenance: 250 different vehicles and road-building
machines

Number of machines in the central maintenance

workshop: 4 /unsatisfactory/

Short description:

The repair is on a very low level. The machinery outfit is very incomplete. It has got a manufactural character. The machines and vehicles are repaired only after a break down. The quality of repair and maintenance is just to be accepted.

It is urgent need to organize the maintenance of the machines and to complete the machine tools.

Denomination of firms: 14. Workshop for Road Building
and Transport Repair of Aleppo

Date of establishment is unknown

Total employment: 30 for maintenance

of which engineers or technicians- /unsatisfactory/
manual workers: 28 /satisfactory/

of which skilled workers: 10 /acceptable/

Independent maintenance shop exists it is acceptable

Engineers or technicians in the maintenance: see above
" "

Maintenance workers: " "

There among the maintenance workers are: " "

skilled workers:

Spare parts store dont exist

Est. spare parts stock for: -

Imported spare parts: amount to 100 % of total

Number of machines and equipments needing

maintenance: 51 cars and trucks of different types

Number of machines in the central maintenance

workshop: 8 /acceptable/

Short description:

The workshop is at a medium level. A small repairing is done at the vehicles every 25.000 km and a general-overhaul every 100.000 km. The machine-working of the maint parts is carried out with an outside enterprise.

It is urgent need to organize the spare parts store and the preventive maintenance.

Denomination of firms: 13. Repair Centre of Aleppo

Aleppo. Date of establishment unknown

Production:

Total employment: 71 for maintenance

of which engineers or technicians: 1 /unsatisfactory/

manual workers: 70 /satisfactory/

of which skilled workers: 13 /unsatisfactory/

Independent maintenance shop exists, it is unacceptable

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists but it is unsatisfactory

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Denomination of firms: 14. Workshop for Road Building
and Transport Repair of Aleppo

Date of establishment is unknown

Total employment: 30 for maintenance
of which engineers or technicians-/unsatisfactory/
manual workers: 28 /satisfactory/
of which skilled workers: 10 /acceptable/

Independent maintenance shop exists it is acceptable

Engineers or technicians in the maintenance: see above
Maintenance workers: "
There among the maintenance workers are: "
skilled workers: "

Spare parts store dont exist

Est. spare parts stock for: -

Imported spare parts: amount to 100 % of total

Number of machines and equipments needing
maintenance: 51 cars and trucks of different types

Number of machines in the central maintenance
workshop: 8 /acceptable/

Short description:

The workshop is at a medium level. A small repairing is done at the vehicles every 25.000 km and a general-overhaul every 100.000 km. The machine-working of the maint parts is carried out with an outside enterprise.

It is urgent need to organize the spare parts store and the preventive maintenance.

Denomination of firms: 15. The Transport Station of Damascus
Damascus.

Date of establishment
still under organization

Total employment: 44 for maintenance
of which engineers or technicians: - /unsatisfactory/
manual workers: 40 /acceptable/
of which skilled workers: 4 /unsatisfactory/

Independent maintenance shop exists, it is unsatisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and it is acceptable

Est. spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amounts to: 100 % of total

Number of machines and equipments needing

maintenance: 51 Magirus and Mercedes buses

Number of machines in the central maintenance

workshop: no machine tools, /unsatisfactory/

Short description:

The maintenance is still under organization. Emergency
repairing are carried out, but in a very bad quality.
They have no machines at all, only a very few number of
skilled workers, so one cannot speak of any maintenance.
50 % of the vehicles was out of order.

It is urgent to complete the machine tool park and organise
the preventive maintenance.

Denomination of firms: 16. The Municipal Equipment station
of Damascus

Date of establishment unknown

Total employment: 121 for maintenance
of which engineers or technicians: 2 /acceptable/
manual workers: 115 /acceptable/
of which skilled workers: 10 /unsatisfactory/

Independent maintenance shop exists, it is unsatisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare part store exists: acceptable

Est. spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amounts to: 100% of total

Number of machines and equipments needing
maintenance: 160 different road building machines

Number of machines in the central maintenance
workshop: 7 /unsatisfactory/

Short description:

The outfit of the station is very incomplete and badly organized. The machines get only an emergency repair, there is no maintenance. The quality of the repair work is at a very low level. It is a big disadvantage, that the machines needing maintenance are of the most different types and models. The station must be completed and organized.

Denomination of firms: 17. The Syrian Railways

Aleppo established in 1906

Production: Maintenance shop for the Railways

Total employment: 372 for maintenance

of which engineers or technicians: 22 /satisfactory/

manual workers: 350 /satisfactory/

of which skilled workers: 150 /satisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare partstore exists and well ordered

Est. spare partstock in value for: 2 years /excessive/

Imported spare parts amount to: 50 % of total

Number of machines and equipments needing

maintenance: 10 Diesel 96 steam locomotives

1050 different wagons

Number of machines in the central

workshop: 60/in quantity sufficient but most of them are
out of date/

Short description:

A well organized factory. The maintenance of the rolling material is adequate. They are holding periodical supervisions. The maintenance of the factory machines is functioning also good. In spite of the fact, that the average age of the machines is 50 years, they are in a rather good condition. The factory has got also a casting house. That is the largest in Syria. Its capacity is not exploited. In case of a modernization, it would be suitable as a central casting house for a spare part supply workshop. A training to grow up skilled workers is also going on. It should be worth to renew the machine tools and equipments.

Denomination of firms: 18. The Hedjaz Railways

Damascus established in 1902

Production: Maintenance shop for the Railways

Total employment: 275 in the maintenance

of which engineers or technicians : 9 /satisfactory/
manual workers: 252

of which skilled workers: 150

Independent maintenance shop exists, it is acceptable

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and well ordered

Est. spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amount to: 4% of total

Number of machines and equipments needing

maintenance: 35 steam locomotives 4 diesel locomotives
486 different wagons

Number of machines in the central

workshop: 70 /unsatisfactory, because most of them are
out of date/

Short description:

A well organized factory. The maintenance of the rolling material is adequate. They are holding periodical supervisions. The maintenance of the factory machines is functioning also well. The factory has got also a casting house. The machines are very out of date and it is not possible to modernize the casting house at its place.

19. PRIVATE SECTOR FOR REPAIR OF TRANSPORT AND AGRICULTURA
MACHINERY SERVICE OF DAMASCUS AND ALEPPO

Short description

In both cities the repair of public road vehicles and agricultural machinery is carried out by craftsmen. They have workshops with a complete outfit of machines and other equipments and are working with a personnel of 5-15 men. They are good specialists. In those workshops they are producing also cogwheels and pumps. About 300-300 of this kind of workshops is functioning in Damascus and Aleppo. In KAMESHLI, which is an agricultural center in the North-East part of Syria, we saw the same kind of well equipped workshops.

Denomination of firms: 20. Skelbich Station Agricultural
Equipment

Skelbich established in 1968.

Total employment: 50 for maintenance
of which engineers or technicians: 1 /acceptable/
manual workers: 49 /satisfactory/
of which skilled workers: 31 /satisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above
Maintenance workers: "
There among the maintenance workers are: "
skilled workers: "

Spare parts store exists and it is well ordered
Est. spare parts stock in value for: no experience
Imported spare parts amount to: 80% of total
Number of machines and equipments needing
maintenance: 19 tractors, 25 cars and 6 electric generators
Number of machines in the central
workshop: 8 /satisfactory/

Short description:

Was just recently established. There is no experience yet.
The station is modern, well equipped, suitable also to carry
out maintenance of a bigger number of machines.

Denomination of firms: 21. Kameshli Station

Kameshli established in 1968

Independent maintenance shop exists, it is satisfactory

Spare parts store exists and well ordered

Est. spare parts stock in value for: no experience.

Imported spare parts: amount to 90 % of total

Number of machines and equipments needing

maintenance: 250 tractors and other different agricultural
machinery

Number of machines in the central maintenance
workshop: 13 /satisfactory/

Short description:

The station has not started yet with the regular work,
so no data were available.

It is a well equipped, modern station, which is suited for
the maintenance of above mentioned machinery. Next to the
station there is a machinist school; where they started
already with the teaching.

Denomination of firms: 22. SADCOP Airport Service of
Damascus

Established in 1953

Its task is to refill the aircrafts landing
at the airport with fuel.

Total employment: 5

of which engineers or technicians:-

manual workers: 4 /satisfactory/

of which skilled workers: 4 /satisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technician in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and well ordered

Est. spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amount to 100 % of total

Number of machines and equipments needing
maintenance: 15

Number of machines in the central maintenance
workshop: only small machines for manual work

Short description:

A well organized small station. They use for the equip-
ments a preventive maintenance. They have an inventory of
the spare parts, and also manuals of the machines are
available. There are difficulties with the obtaining of
spare parts, since the producing enterprises are on the
embargo list.

Denomination of firms: 23. SADCOP Pump Repair Station
of Damascus

Established in 1953

Total employment: 39 for maintenance managed
by the Head Office

of which engineers or technicians: -

manual workers: 35

of which skilled workers: 8 /unsatisfactory/

Independent maintenance shop exists, it is satisfactory

Engineers or technicians in the maintenance: see above

Maintenance workers: "

There among the maintenance workers are: "

skilled workers: "

Spare parts store exists and well ordered

Est. spare part stock in value for: 1 year /satisfactory/

Imported spare parts amount to: 100 % of total

Number of machines and equipments needing

maintenance: 400 petrol station

Number of machines in the central maintenance

workshop: only small machines for manual work

Short description:

A well organized central maintenance station. The quality of the accomplished work is adequate. They have moving service-groups to repair the outside petrol-stations, the general-overhaul is done in the workshop. In case of a general overhaul they are giving another equipment for exchange.

Denomination of firms: 24, Vegetable Oil Plant of Aleppo
Date of establishment unknown

Production: Cotton seed oil

Total employment: 1200

of which engineers or technicians: 9

manual workers: 1130

of which skilled workers: 200

Independent maintenance shop exists, it is satisfactory
Engineers or technicians in the maintenance: 3 /acceptable/

Maintenance workers: 100 /acceptable/

There among the maintenance workers are: 20

skilled workers: unsatisfactory

Spare parts store exists and well ordered

Est. spare parts stock in value for: 1/2 year /acceptable/

Imported spare parts amount to: 90% of total

Number of machines and equipments needing
maintenance: 250 units

Number of machines in the central maintenance
workshop: 11 /acceptable/

Short description:

The technical direction of the factory is good. The technical direction is maintenance minded, The skilled workers group for maintenance is well trained. They just started to chart and draw up the floating spare parts. The maintenance workshop has got its own construction group. In the maintenance workshop they are also modernizing the machines.

It needs some help to initiate the preventive maintenance.

Denomination of firms: 25. Sugar Plant Adra
Damascus date of establishment
unknown

Production: Sugar

Total employment: 900

of which engineers or technicians: 4

manual workers: 850

of which skilled workers: 40

Independent maintenance shop exists,

Engineers or technicians in the maintenance: 1 /unsatisfactory/

Maintenance workers: 70 /satisfactory/

There among the maintenance workers are: 30

skilled workers: /satisfactory/

Spare parts store exists on medium level

Est. spare parts stock in value for: 1 year /satisfactory/

Imported spare parts amount to: 80 % of total

Number of machines and equipments needing

maintenance: 1 unit

Number of machines in the central maintenance

workshop: 9 those are out of data

Short description:

The organization of the plant is of medium level. The production loss is about 20 % due to machines out of order. They use an operational maintenance. The maintenance of buildings and auxiliary equipment is neglected.

It has to be organized a preventive maintenance system for the Sugar Plants.

Denomination of firms: 26. Sugar Plant of Homs

Homs, date of establishment unknown

Production: Sugar

Veg. oil

Alcohol

Total employment: 871

of which engineers or technicians: 12

manual workers: 830

of which skilled workers: 40

Independent maintenance shop exists, /unacceptable/

Engineers or technicians in the maintenance: 1 /unsatisfactory/

Maintenance workers: 87 /acceptable/

There among the maintenance workers are: 20

skilled workers /unsatisfactory/

Spare part store exists on medium level

Est. Spare part stock in value for: 1 1/2 year /excessive/

Imported spare part amount to: 70 % of total

Number of machines and equipments needing
maintenance:

Number of machines in the central maintenance
workshop: 11 /acceptable/

Short description:

The plant is similar to the one of Damascus. The production loss is about 20-25 % due to machines out of order. A proper technical direction is missing. No measure is taken of the floating spare parts.

It has to be organized a preventive maintenance system for the Sugar Plants.

Denomination of firms: 27. The Oil Refinery
Homs established in 1964.

Production: Petrol and oil products

Total employment: not available
of which engineers or technicians:
manual workers:

of which skilled workers

Independent maintenance shop exists, it is satisfactory

Engineers in the maintenance: 4 /satisfactory/

Maintenance workers: 140 /satisfactory/

There among the maintenance workers are: 40
skilled workers /unsatisfactory/

Spare parts store exists and well ordered

Spare parts stock in value for: 1 year /satisfactory

Imported spare parts amount to: 90% of total

Number of machines and equipments needing
maintenance: 1 unit

Number of machines in the central maintenance
workshop: 15 /satisfactory/

Short description:

It is a new plant, delivered by the SKODA Works plant. It is a plant of full capacity existing of two units and is just before completion. The maintenance is under reorganization, but it can be already taken as a preventive one. A special control group is checking the equipments and is delivering a report to the chief of maintenance. Periodical supervisions and repairs are carried out. A catalogue and a list of the spare parts is available.

Appendix "D"

Bibliography

"Statistical Abstract"

Directorate of Statistics

Second Five Year Plan 1966-70

Ministry of Planning

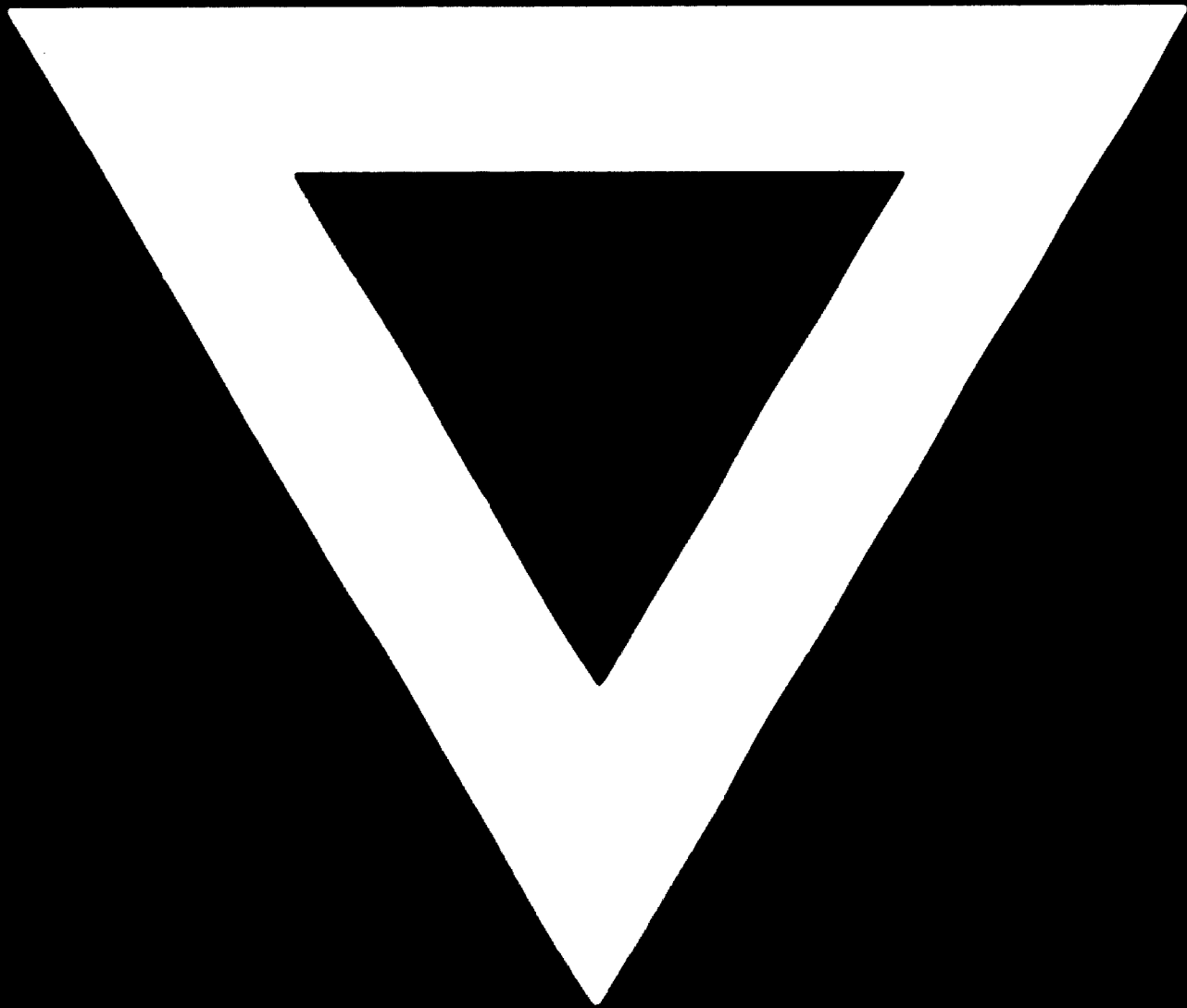
"Industrial development in the Arab Countries"

by U.N.

Statistics of Extremes

EJ Gumbel





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