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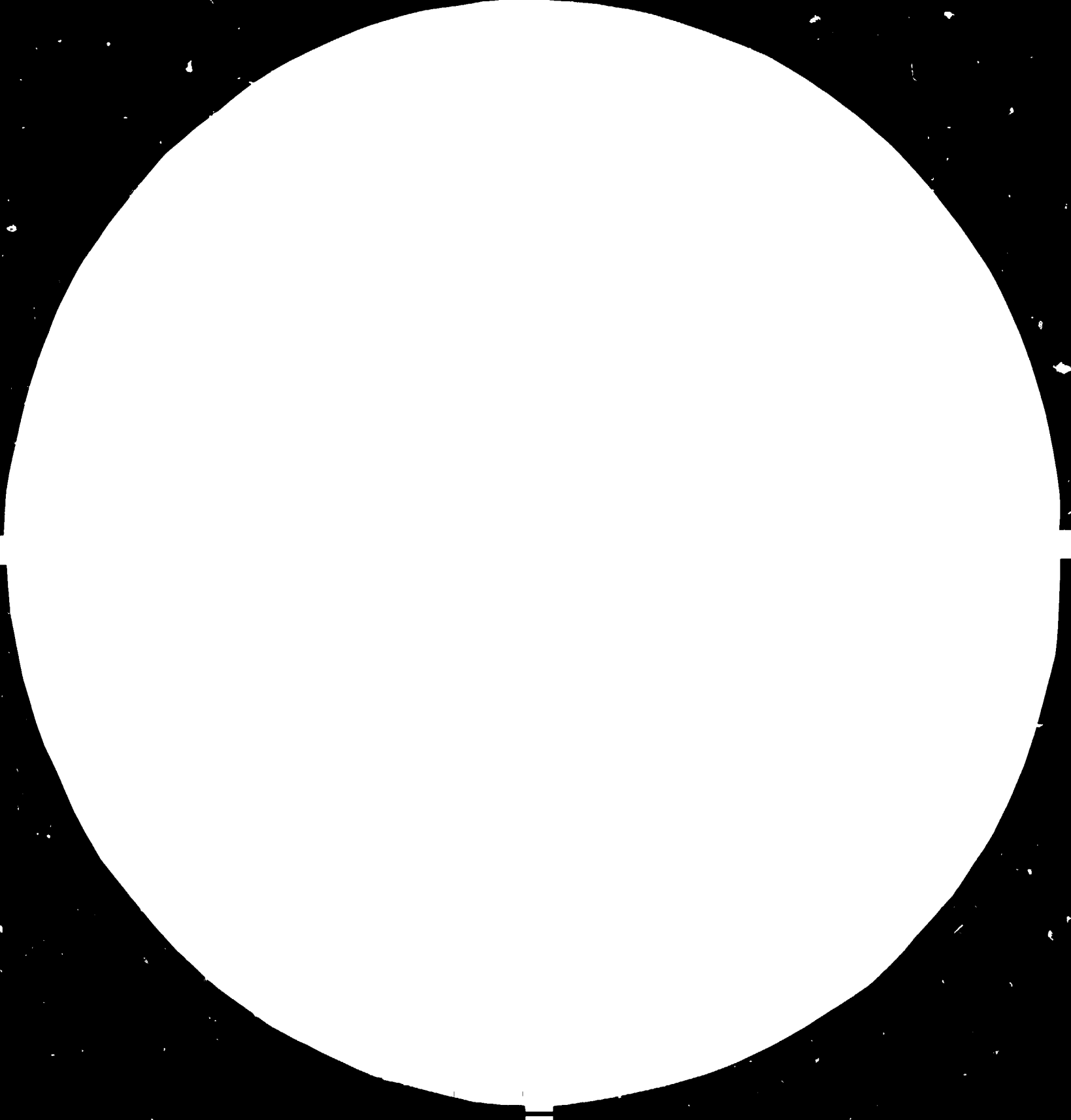

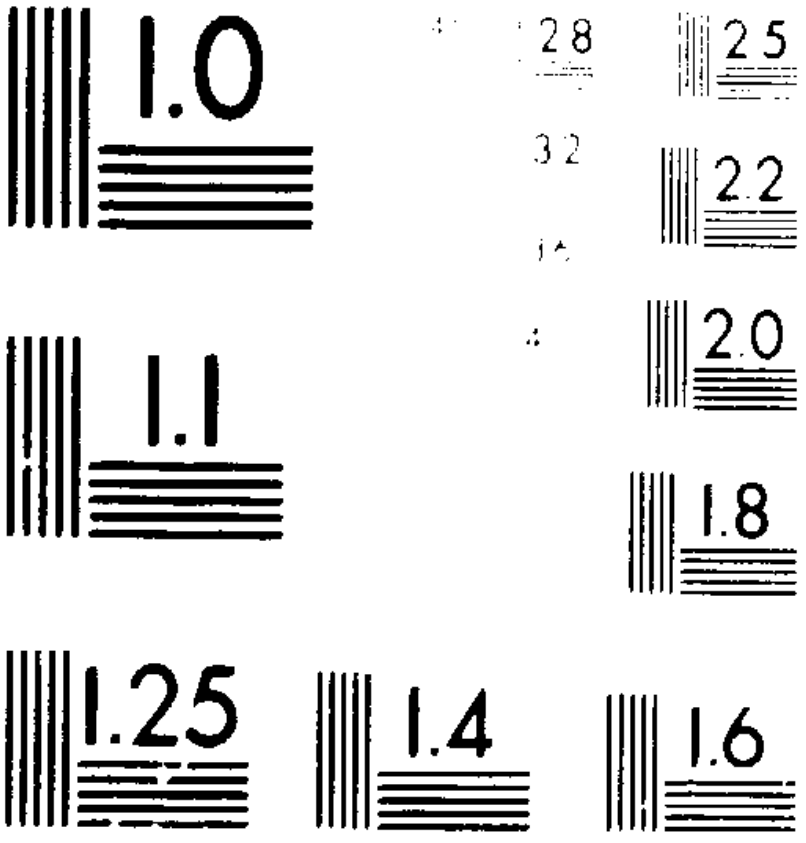

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13844

RESTRICTED

May 1984

ENGLISH

EXTENSION SERVICES FOR

SMALL INDUSTRY

DP/TUR/80/010

TURKEY

Prepared for the Government of Turkey by the

United Nations Industrial Development Organization executing

agency for the United Nations Development Programme

Turkey.

Survey on the activities of Küsget and recommendations

for the improvement of the workshop and the extension service

section. prepared by

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United Nations Industrial Development Organization

Vienna

TABLE OF CONTENTS

Introduction

The survey carried out aims to give all necessary information for the further improvement of the existing workshop attached to KÜSGET in Gaziantep as well as give recommendations for the improvement of the Extension Service Section.

The recommednations are based on an assessment made by the expert through his observations of the workshop and visits to model industry sites.

In January 1984 the Gaziantep Industrial Estate consisted of 1146 workshops and 50 model industry workshops. Approximately, 80 % of the workshops are being utilized. The 50 model industry workshops are occupied by 24 companies and 26 are still empty.

I GENERAL STATEMENT ON THE GAZIANTEP INDUSTRIAL ESTATE

The estate is planned to help the Government and the municipality to solve the problems arising from the explosive growth of the city. This has occured mainly in two ways. The first is the overcrowding of the old city with small enterprises working often under poor conditions. The second is the inability of the municipality to cope with the increased demand of electricity, water and sewerage.

A. The estate at present

It consists of 1146 workshops of different sizes. (see Annex I). Additionally, there are 50 model industry workshops.

1. Roads

The main roads within the estate are paved. The sewage system is not working properly. Therefore, during rain seasons, the roads are flooded.

2. Workshops

The construction of the workshop is often poor due to substandard of the expansion-joints and therefore water leaks through. The same applies to the roofing work. The workshop floors are of very rough and uneven concrete without fine coverlay.

3. Backyards

Gateways and space around the workshops are not paved.

B. Statements of Tennants

Many of the occupants of workshops are in general interested in improving the conditions of their workshops. Due to obscurity of the ownership and other unclear circumstances they leave everything as it is.

C. Cooperation between SSI and KÜSGET

The cooperation and contacts between small scale industry and KÜSGET is minimal according to entrepreneurs' opinion, caused by the high fees charged by KÜSGET for services and the inability of KÜSGET to assist small enterprises in the transfer of appropriate technology.

D. Findings of the Consultant

Besides the workshop there is no active extension service; the reason for this may be seen in the number as well as in the quality of personnel. To carry out successful extension service it is necessary to have experienced staff. The staff must be able to gain confidence of the clients and to speak their language. This does not mean Turkish; this means the language of the small entrepreneur in technical terms. The team of extension officers of KÜSGET can not cope with the requirements, either in technical nor in economical field, in which the expert could not find activities related to the economic requirement of small enterprises.

II STRUCTURE OF INDUSTRY

The estate workshops are built for any type and size of industry, except for large companies (see annex I). The tennants of the workshops are listed in annex 2. Approximately 80 % of the workshops were occupied in January 1984. There was no information available on the number of employees. It was also stated that the number of employees fluctuates depending on the orders on hand for the small scale entrepreneurs. (SSE).

A. Small Scale Industry

The number of the workshops occupied is around 900 which is 80 % of the total workshops. The number of employees range from 1 to appr. 25, with some exceptions.

The average can be considered 4 to 6 employees. As it is shown in annex 2 there is quite a number of enterprises working in fields where new techniques are already used in big companies. As the small scale industry is connected directly as subcontractor or indirectly as service to the end user, there is no question that the SSI must be promoted to enable them to cope with the requirements and to survive, respectively to improve their quality and production. This can and should be done in three ways:

The first and most helpful way for SSI is the availability of necessary modern equipment and tools to meet the requirements.

The second important way to assist SSI is the technical assistance through the extension service. From such service the know-how and transfer of technology has to come. This service has to function in the field mainly in the workshop of the entrepreneur.

The third way to assist is to provide training in Management and Business Administration. It will take some time before the entrepreneurs accept such service, and a basis for confidence must first be formed between the extension officers and the entrepreneurs. This kind of service is absolutely necessary to improve know-how of small scale entrepreneurs and to put the business on a well based foundation.

B. Model Industry

This is the group where KÜSGET has put its emphasis. It is also the group which has a high standard in products and equipment. What they lack and are expecting from KÜSGET is the assistance of a designer and other staff members trained in engineering and economics. Unfortunately, this group is in the most cases outside of the present definition of small-scale industry.

As mentioned before, these enterprises are the bridge between the large and the small scale industry. These companies are able tc supply the large industry with good quality spare parts as well as with machines and equipment adequate to meet the demand.

Furthermore, they are manufacturing consumer goods of satisfactory quality and at a reasonable price. They are playing an important role in import substitution.

What applies to the small scale entrepreneurs, as mentioned under(A) is also valid for this group. The difference is that the model industry requires a higher standard of services. (see annex 3)

III WORKSHOP

The workshop is consisted with 5 sections:

- design office
- laboratory
- mechanical workshop
- heat treatment section
- forging and press section

A list of the existing machinery and equipment is attached as annex 4.

A. Design Office

In the design office in January 1984 3 members were working. One of them was an experienced technician, the other two were engineers, one was newly hired and without experience. The requirements of the industry for design of tools, mould, fixtures, etc. include the whole spectrum of industrial goods, e.g. for metal, plastics, casting and wood. These requirements exceed the capability of the designers. The selection for orders from the industry is made by the management of KÜSGET taking into consideration

the capability of the design department. This procedure would prevent the design department from over-charging customers on the one hand but on the other hand KUSGET can not fulfill the expected services.

B. Laboratory

In general, the laboratories are equiped with all the necessary testing equipments. Unfortunately, there are some appliances which can not be used since they were not maintained in working condition. Also some chemicals are no more available because they were depleted and could not be replaced. (see annex 5)

C. Mechanical Workshop

The mechanical workshop in general is in satisfactory conditions. The machines and the equipment are maintained to the best of the knowledge of the personnel. Since the machines have been in operation for approximately 10 years there is normal wear and tear especially by those which are frequently utilized. A description of the condition of each machine is given in annex 4. The utilization of the workshop equipment is given in annex 6.

Most of the main customers come from the estate and only few from outside. As the occupation of the workshops has started only a few years ago there were not enough clients to use the existing capacity fully. Another reason can be seen in the high price for services according to the opinion of a number of entrepreneurs.

The clients are small scale industrialists and in many cases not able to pay the relatively high price. Also the quality is not considered so high by them and therefore they prefer to get their work done somewhere else and spend less.

D. Heat Treatment Section

The equipment is in a good condition. Unfortunately, the Fulmina furnace is completely out of order since December 1983 due to broken heating elements. As this is a normal wear it does not reflect the condition of the furnace. As it can be seen in annex 9 the utilization of the heat treatment section is declining due to the high fee for service; one of the entrepreneurs claimed that KÜSGET is charging 50 % more than he pays in Istanbul.

E. Forging/Press Section

This section has never been operational since it was installed. The machines were misplaced and the foundations were too weak. A new building for this section is under construction, but it is being built too close to the laboratory. The vibration of the machines will disturb the laboratory equipment.

IV EXTENSION SERVICES

The extension service is organized in such a way that there is one Industrial Coordinator who visits SSIto discuss any problems and offers the assistance of KÜSGET. If entrepreneur is interested, the problems are defined and assistance is arranged through KÜSGET by the management of the section concerned for a solution. If there are possibilities to solve the problem an offer is made to the entrepreneur and also a quotation is given. If there is only consultation involved then it is given free of charge.

A. Technical Service

There are five main services carried out under the present scheme:

1. Design of tool and fixtures
2. Manufacturing of tools and fixtures
3. Manufacturing of parts
4. Reconditioning of tools and parts
5. Heat Treatment

The important service of consultation and problem-solving at the workshop site is not active because there are no personnel available. The design section is not in a position to carry out all the work demanded due to lack of experience.

B. Economic and Management Service

This section is up to now occupied with feasibility studies to establish new model factories. These have no direct relationship to the extension service to the SSI. The personnel available is also not in the position to carry out such service for the small enterprises due to lack of experience.

V. RECOMMENDATIONS

As there were delays in the occupation of the workshops in the estate it seems difficult to assess the value of the KÜSGET workshop for the promotion of the small scale industry in the area. Nevertheless, the work carried out during the last three years was important for a certain number of enterprises in Gaziantep. Since the estate is occupied by now with approximately 900 SSI and most of them have moved in within the last months, it should be assumed that the workshop and the extension services, technical and economic, will be required much more than in the past.

A. Pre-conditions for an effective extension service

Every work is depending on the personnel who carry out the work. The available personnel are not in a position to cope with the requirements, e.g. design of all kind of dies and moulds. The whole extension service departments must be strengthened by means of numbers and particularly by experienced staff.

B. Workshop Improvements

As previously described there are improvements needed in the existing equipment as well as for extension services. The repairs (described in annex 7) of the existing machines should be approved.

Additional machinery (annex 8) should be installed to ensure that all kind of work demanded can be made in the workshop. If the recommended new machines are approved then it will be absolutely necessary to have the operators for some of this new equipment trained, e.g. for the universal tool and cutter grinder. For such training of the workshop staff it is advisable to recruit the trainers from the manufacturer for approximately one month rather than to send machine operators abroad. If the trainer is in the workshop a number of operators can be trained. The communication would be easier as a translator can be found within KÜSGET.

For the maintenance of the machines in regular intervals a highly skilled worker should be hired. Besides his main duty, responsible for the KÜSGET workshop machinery, he could also take part in the extension service and give advice to SSI on maintenance.

C. Forging / Press Section

As this equipment was never utilized it is difficult to assess the necessity within KÜSGET. In the opinion of the consultant there is no use for the equipment in KÜSGET. This section will only add to the expense of the workshop.

Two solutions are recommended:

a) selling the equipment if possible; if necessary, on credit.
b) rent the equipment to somebody who can use it on a basis which saves KÜSGET from expenses.

D. Technical Extension Service

During the relatively short visits to a number of small enterprises the consultant observed many difficulties small entrepreneurs are facing. The small entrepreneurs will be appreciative if they can be advised on how to solve their problems. Therefore, it is necessary that highly skilled and experienced persons are engaged in the main fields of metal and wook working.

It should be pointed out here: every extension service is a costly investment but it will pay off. Not in short time but in the long run. At the present stage of the small and medium scale industry development in Turkey, the support through a qualified extension service team i necessary to enable the SSI to cope with the growing requirements.

E. Economic and Management Extension Service

For this field the same as described under C. applies in general.

As the main group of SSI in the Estate are service industries, requests for support will be less than in the technical assistance.

F. Fees for Extension Service

The enterprises located in the estate and also the SSI in the town of Gaziantep are predominantly not well off in their financial status. Many of them are just surviving. To give

all of them the same chance to profit by the service offered through KÜSGET the fees charged should be reasonable to them. It could be considered to offer the services of KÜSGET for a limited period on a basis calculated as if the utilization would be 100 %. By such calculation the KÜSGET workshop would not be working to cover cost. The advantage in such arrangement would be to get the confidence of SSI and simultaneously to help some of the entrepreneurs to get their feet on the ground and improve. As this period of low pricing would be limited the loss accrued is also limited.

By the time the confidence is gained, the workshop could be utilized fully by incoming orders.

G. Assistance for the Design Department

During the discussion on 8 February 1984 between the Director, the Vice Director, the Coordinator, the workshop manager, and the UNIDO Adviser the following proposal was agreed upon.

The initial provision for a long-term expert post in design should be substituted by short-term experts. The reason for this change is that many kinds of different tasks are demanded. It would be impossible for one expert to fulfill all requirements. Therefore, it is advisable to provide short-term experts for the different problems and when the need for such assistance arises. Presently, there is a need for an expert for plastic moulding design. KÜSGET is in possession of an order for the design of a complete set (12 pieces) of plastic moulds for a handpump as part of an agricultural implement.

With the necessary support by draftsmen this order would require an expert in plastic moulds design for approximately 2 months. Other orders in KÜSGET in January 1984 were the design of spare parts for textile machines and aluminium

injection moulding. Possibly,this design could also be made by the plastic moulding expert.

It was expressed by the UNIDO Adviser that even if experts for different fields are made available it is still necessary to have within the design department counterpart engineers of the same specialization. Otherwise, a short-term expert would be only a problem-solver for one single task instead of fulfilling the training aspect intended. It would be advantageous if the design department could be supplied with relevant documentation such as textbooks, manuals and professional periodicals, especially for plastic and injection moulding.

H. Comments on the proposal of KÜSGET for additional machines

Considering the small number of dies and moulds manufactured during the past three years, there is for the time being no justification for additional high precision machinery than recommended in annex 8. If it should be necessary to increase the capacity for spare parts manufacturing due to higher demand then the available capacity should be utilized by more defined working processes.

The tools in use are in improper condition. This real problem can be solved with the recommended Universal Tool Grinder, as well as with the recommended cutting tools. In case these improvements have taken place there will be more capacity available since the machines can be operated with higher speed and efficiency. An examination after one year is recommended to assess if additional equipment/machinery are justified based on utilization rate.

VI. A. SUCCESSFUL EXTENSION SERVICE

The main problem is the communication. As of January 1984 there were few English-speaking members of KUSGET and they were working outside of the service departments.

English courses are on-going but it will take some time until a practically comprehensive level is achieved. Another problem is that the staff is young and unexperienced. The entrepreneurs have acquired business skills through self- training or by tradition. Experienced assistants can bridge the gap between extension officers and the entrepreneurs. In direct service it is important that the advice given to an entrepreneur should take into consideration various technical aspects, such as the ability of the entrepreneur to understand why he should change a certain workprocess. The advice must be appropriate to the expected improvement, not too modern nor too costly. The profitability must be evident. Such service can not be offered under the present circumstances.

A cadre of extension officers must be trained but not initially placed in the field. If a small scale entrepreneur is aware that they are beginners trying to learn from his problem, he will not listen to their advice. The training should start by in-house courses and by visits to large companies. The mechanized work process can be learnt there and such a process needs to be reorganized into single work processes utilizing simple equipment yet maintaining high quality. As the spectrum of SSI covers all fields, e.g.metal, sheet metal, wood, plastic, etc., it is necessary to divide the extension service into these different fields.

Regarding the personnel selection one should not consider ambitious persons who are interested in a high level position and desk work. Persons who have an interest in creativity, working with other people and with their own hands are needed. One aspect must be taken into consideration, persons described

before know their value and will not be found easily. Another pool of experienced persons should be considered for the extension service. They are persons aged 50 and above who are from large enterprises and their ways of communication can be of high value. The extension service departments, technical and economic, must be equiped with a wide spectrum of literature, catalogues and periodical journals of different fields.

An appropriate data bank must be created and information should be made available to the SSI.

An extension service department should be able to assist small up to medium size companies with conventional and with new enigneering processes. To train people for extension service it is advisable to begin with the training of trainers. During the training period excursions by the extension officers should be arranged regularly in order to acquaint themselves in existing problems.

VI. B. PROPOSAL FOR THE SET UP OF AN EFFECTIVE EXTENSION SERVICE

The required technical and business administration extension servicesto small-scale entrepreneursare described first in details. The following fields must be covered:

Technical:

- production methods
- use of appropriate materials
- use of appropriate tools
- use of appropriate machinery
- maintenance and repair of equipment
- modification of existing equipment

Physical service available in Gaziantep

Assistance through the workshop by manufacturing of tools and fixtures, reconditioning of tools and production of spare parts.

Assistance through the workshop by material testing and practical advice and/or sample production.

Assistance through the design department by design of tools and fixtures.

Assistance by the heat treatment section.

Business administration:

feasibility studies
company organization charts
training of staff in all aspects of business fundamentals, particularly in:

- preparation of detailed calculation sheets, book-keeping sheets, stock keeping systems, purchasing system
- assistance in marketing
- assistance in consorting with administrative departments
- assistance in all financial questions especially in obtaining loans

These services must be available in different stages of progress according to the level of the individual entrepreneur consulted. The described activities are so extensive that a highly qualified and experienced staff is necessary to fulfill them. This kind of personnel was not available at that time and they must be trained. The time it takes to get a cadre of well qualified extension officers to the required level of training is dependent on how training programme is carried out.

Some preconditions of the personnel selected are absolutely necessary. The most important one is the interest and willingness to work with people whose education is in most cases below the standard of the adviser. He must be able to speak their language in order to act as their teacher.

If an applicant is expecting to be a deskworker he is not acceptable. Applicants without the experience of a minimum of 2 to 4 years in 2 or 3 companies also do not meet the requirement. The following group of specialists are recommended:

4 members for technical assistance

- 1 experienced engineer from the metal industry
- 1 designer/rationalization engineer
- 2 engineers with minimum of 2 years industry experience in metal-, sheetmetal-, wood- or plastic-production

3 members for business/management administration

- 1 experienced financial or book-keeping/calculation expert
- 2 members with a good knowledge in economics and if possible with some technical background

To train this staff for extension service the office should be in an area where modern industry and large enterprises of many kind of production lines are established, preferably metal- and plastic-industry. It is necessary to have access to modern techniques in engineering and management fields. The time to develop a serviceable team of consultants to small enterprises may take up to one year. A time schedule would be as follows:

6 months to build the basis:

- establish the office
- gathering and selection of information
- prepare working method charts
- internal training courses of different preparations of patterns for extension services for different fields
- visits to modern companies
- analyse the experience gained through these visits in addition 3 to 6 months of training on-the-job
- visits to small scale entrepreneurs in different parts of the country where SSI are concentrated
- take up and analyse the problems of the visited SSI
- work out solutions for the problems realised

During the visits to different places it should be analysed in which particular areas what specific products are manufactured and what kind of specialized firms could

have a market there (for example heat treatment, galvanic, manufacturing of simple machinery for agricultural implements and repiar, etc.). SSE need information on the source of supply of raw materials and various types of parts.

Taking into consideration the multitude of duties which influences the success of the extension service department, it would be not less than two years until the department becomes operational. Then the service could oe made available to the SSI in the different parts of the country by the stationing extension officers . Each of the trained and experienced extension officers could have one or two beginners assigned to him as a trainee.

All activities carried out should be registered in the central office to set up a data bank. Within a certain time this data bank will serve as solution source especially in cases which have arised already somewhere and are solved.

ANNEX I

Estate Workshops

Type 1	214 Workshops	each of 66 m²	=	14,124 m²
Type 2	450 Workshops	each of 80 m²	=	36,000 m²
Type 3	128 Workshops	each of 120 m²	=	15,360 m²
Type 4	206 Workshops	each of 160 m²	=	32,960 m²
Type 5	88 Workshops	each of 240 m²	=	21,120 m²
Type 6	36 Workshops	each of 320 m²	=	11,520 m²
Type 7	24 Workshops	each of 480 m²	=	11,520 m²
				142,604 m²
Model-Industry	50	each of 800 m²	=	40,000 m²
				182,604 m²

ANNEX .2

Type of enterprises

The workshops at the Estate
are occupied by appr. 80 % of the tennants
According to the Cooperative all the Workshops are allocated as follows.

Group A

Metal turner	111	
Copper manufacturing	81	
Blacksmith	62	
Ligth steel construction	29	
Foundry	32	
Scrap dealer	44	
Plumber	12	
Stove manufactorer	41	
Tin-smith	10	
Cutler	4	
Air-brake-repair	3	
Hunting rifle	3	
Welder	6	
Money safe	22	
Blind manuf.	14	
Various	10	= 484

Group B

Car repair	84	
Car body-making	65	
Car-electric	40	
Car-painter	25	
Car-upholstery	11	
Car-radiator repair	3	
Truck coachwork	39	
Truck chassis repair	17	
Camshaft grinding	3	
Profil bending	4	
Various	7	= 298

ANNEX 2

Group C

Furniture	64	
Wooden Window/Doors	120	
Sawmill	26	
Wood turner	19	
Wood chairs	7	
Sieve production	7	
Various	9	= 252

Group D

Car tire repair	75	
Plastic shoe	2	
Shoe repair	13	
Electro motor repair	2	
Car glass	4	
Various	8	= 104

ANNEX 3

MODEL - INDUSTRIES
established within the KÜSGET-Estate.

Manufactured Products:
High speed cutting machines
Auto Batteries
Auto Bulbs
Steam boiler
Corrugated board and boxes
Flour and macaroni machinery
Steel foundry
Escalators
Valve for auto motors
Wood screws
Fiberglass parts
Paint
Money-safe

Agricultual implements, 2 weel cart, plough ect.

Textil machinery
Drills, ... , spare parts for machinery
Plastic bag

There are alltogether 24 workshops occupied but 7 companies are closed down for different reasons.

ANNEX 4

List of the machines in the machine - shop

1 - TOS Lathe
2- AJAX Lathe
3 - TOS Milling Machine (Universal)
4 - TOS milling machine (Vertical)
5- AJAX, Turret milling machine
6 - Universal Copy milling machine
7 - Spark Erosion machine
8 - Jig Boring
9 - Cylindrical Grinding machine
10 - Surface Grinding machine (small)
11- Surface Grinding machine (large)
12 - Hydravlic shaping machine
13 - Radial Drilling machine
14 - Drilling machine
15 - Horizantal Bandsawing machine
16 - Metal Bandsawing machine
17 - Hydravlic Bandsawing macihne
18 - Tool Grinding machine
19 - Hand operated screw press/and hydraulic press
20 - Heat Treating Furnace
21 - Tempering Furnace
22 - Salt Bath Furnace
23 - Furnace for forging
24 - Pneumatic hammer
25 - Friction Press
26 - Eccentric Press

ANNEX 4

TOS Lathe (Czechoslowakia)

TEZSAN Takım Tezgahları San.Tic.A,Ş./ Turkey

Typ : SN 45 B

Serial No : 45 15 12 44

1973

Maximum workpiece Ø 450 x 1500

Accurate machining is hard,
Needed general oveshauling

TEZSAN
CAŞIROVA
GEBZE

ANNEX 4

AJAX Lathe

AJAX Machine Tool Co Ltd. / Bulgaria

Typ. CIOM

Serial No : 18335 - B 10138

Maximum workpiece Ø 505 x 1500

1- Gear-box of lead screw is destroyed

2- Gear-box of carriage is destroyed No automatic feeding.

3- Needed general overhawling

ANNEX 4

TOS Milling Machine (Universal) (CZECHOSLOVAKIA)

TOS OLOMOUC , n.p.

Typ : FA 4A-U

Seri : 50890 / N

Table 250 x 1600

Distance between spindle nose and outer arbor support 540 mm with Morse No : 5

Taper in spindle NR 50

Accessories-

1- HUB 25 F 4 A / 2723 Universal Milling Attachment

2- SR 400 Rotary Table

3- HUB 25-4A Vertical Milling Attachment

4- HOB 25-4A Vertical Shaper Attachment

5- Universal Indexing attachment TOS BRAS 134 1971

Inaccurate movement of table prevents good machining

ANNEX 4

TOS Milling Machine (Vertical) Tschech

TOS OLOMOUC, n.p

Typ : FA 4A V

Seri : 60749 /N

Table 250 x 1400 mm

Vertical Travel of spindle 85 mm

Distance between table and spindle noze

min 25 mm
max 540 mm
with morse No:5

Accessories

1- Universal Indexing Attachment

TOS DY 320 1587 1972

2- Rotary Table

No important defect

Annex 4

Turret Milling Machine (Vertical)

AJAX of Halifax Machine Tool Co Ltd. ENGL.

Typ : AJT 4

Seri : 17898 B 10319

Table 1200 x 260

Table movement x-direction 800 mm

Table movement is not accurate

ANNEX 4

Universal Copy Milling Machine

FRIEDRICH DECKEL / München

Deckel KF 12

No : 3959

Vertical Travel of mechanizm	50 mm
Fixed Work table	250 x 700 mm
Max distance, spindle nose to table	475 mm
Range of longitudinal travel	300 mm
" " transverse "	200 mm
Fixed copy holder table	430 x 500 mm
Maximum distance, tracer to table	430 mm

No important defect

/

ANNEX 14

Spark Erosion Machine Tool

Agie-Tron

A.G.für industrielle Elektronik 1 Switzerland

Typ : KE 51/27

Serial No: ABm 55004 45 Lm 002/104

1972

Work Table

length	510	mm
width	275	mm
height	160	mm
weight	200	kg

Longitudinal Travel -X axis- 320 mm

Lateral " y axis- 230 mm

Smallest possible reading 0,01 mm

Maximum distance between

table and gvill 385 mm

Work Tank 300 x 575 x 220 mm

AGIE-PULS

Typ : 45 Lm

Serial No : 002 - 104

No important defect but is in a shortage of allayed electrode with cupper and wolfram

ANNEX 4

Jig Boring

Manex

Ucimu / İtaly

Typ - m

Serial No : 36949

Table dimensions 325 x 700

Vertical movement approx - 750

No important defect but it is needed to change the table movement system.Present sybtem is workeng with " inch " indicator.This causes effective usage of machine.İt needs to be changed to " metric system "

ANNEX 4

Cylindrical Grinding Machine

Jones- Shipman / England

Model 1300 1873/33

Seri No : 73290

Maximum diameter ground with new wheel	254 mm
Grinding length between centers	686 mm
Height from table top to centers	127 mm
Adgustment of table, included angle	20 ^{o}
Table transverse rates, infinitely variable	76 to 3658 mm/mi

No important defect

Surface Grinding Machine

Eclipse / England

628Ł4 / P MODEL 540 6" x 18"

Permanent magnetic table 160 x 450 mm

It is destroyed (only magnetic table)

Radial Drilling machine

AJAX machine tool co. ltd. (England)

Typ. AJ 155
Seri no. 17821 89445

maximum projection of arm 1219 mm

No important defect

Horizontal Bandsawing machine

JAESPA - machinen fabrik / W.Germany

model- w, 260 Ha

Serial No. 724989

1971

Cutting 90°

solid stock approx. 260 mm
flat " 525x120 mm
square " 260x260 mm

Dimensions of blade 3.660x25x0,85 mm

No defect

Drilling machine

MAKİNA KİMYA ENDÜSTRİSİ KURUMU/ Turkey

ms 23

max drilling diametes 23 mm

" " length 120 mm

Vertical movement of spindle 300 mm

Distance between table and spindle min 145 mm

" " " " " max 750 mm

No important defect

Hydraulic Shaping machine

STANKOIMPORT /moscow

Typ. 7A 36 1140

Serial No 64/310198

1972

maximum ram stroke 700 mm

Distance between point of force application and table top working Surface 140 mm

Distance between bearing surface of mandrel and covlmn 400 mm

No important defect

Surface Grinding machine

ZOCCA /İtaly

RPUA 1100 14 6880

Seri No 69131

Permanent magnet table 400 x 1100 mm

Hydraulic system which controls the movement of grinding whell is not working properly Vertical movement is not continous but stepwise

Metal Bandsawing machine

JAESPA Maschinenfabrik /W.Germany.

model AS - 4

Serial No 724990

1971

Wheel Diameter	420 mm
Cutting Height	300 mm
Throat Depth	400 mm
Table size	610x 610 mm
Table stroke	215 mm

No defect

Hydraulic bandsawing machine

Usine de machines - Outils /Bulgaria

model X H 25 m
Serial No. 11415

1973

Cutting 90°

for rectangular 270x 250 mm

For Round Ø 270 mm

No defect

7001 Grinding machine

August ~~von~~ der ~~Ley~~ (Germany)

Typ A1 4

Seri 1816

The machine dees not mect the requirements of our machine shop. A universal grinding machine is needed

---

- 19 -

Hand Operated Screw Press

No defect

Hand Operated Hydraulic Press - 19/A-

Witco /Denmark

No defect

Heat Treating Furnace

fulmina

mod. KES - 8- So- SG WA - 126973

Seri No 17925

max Temp, 1350 C^{o}

maximum workpiece width 500

" " height 315

" " length 800

Heating capacity 45 kw

useful contents 125 lt

The heating resistances need to be replaced

The furnace is not in operation

Tempering Furnace

Fulmina

mod- Umw 2100/39.4

Seri- 607827

1973

Maximum temperature 650 C°

Pot diameter ø 600

pot length 800

useful contents 225 lt

capacity 36 kw

charge weight 400 kg.

No important defect

Salt Bath Furnace

Fulmina

mod. SB- E 508 wA 570/ 126975

Seri - 17927

bath temperature 950 C°

Furnace temperature 1050 C°

pot diameter Ø 500 mm

pot depth 800 mm

No defect

Furnace for forging.

Özköseoğlu /Turkey

1973

maximum workpiece dimension 200x 350 mm

" " depth 500 mm

Fuel fired furnace

not in operation.

Pneumatic Hammer for smith forging

ZAMECH /Poland

Typ. ms 400 5040

Serial No. 6120008

around 1976

max. stroke of ram 660 mm

Top anvil 240x150 mm

Energy of full blow 1050 Kg-m

" " " single blow 945 Kg-m

Number of blows per minute 130

Weight of anuil block 5400 Kg.

maximum diametes of fargat malenial 280 mm.

Efficiently forged forged parts - square up to 110 mm

" " " - round upto 125 mm

Friction Press

Berrenberg- Pressen

Typ. RSPP 200/400

Serial No. 15370
1974

It is not in operation, A consultant might be needed.

Eccentric Press

Bas massey /England

Serial no. 09.1409

strokes per minute 60

machine sise 200 ton

It is not in operation, A consultant might be needed.

ANNEX 5

Laboratory equipment

Required
Replacement:

PERMASCOP
Helmut Fischer GmbH
D
Type: ES 2 D 3 J 4a
Volt: 22 VA 12

Dynamometer

max. 10.000 kp
for AMSLER Type 1033 (Masch.Nr. 394)
Wolpert-WErkstoffprüfmaschinen
CH-8201 Schaffhausen

Spring Tester
max. 1.000 kg
no supplier recommended

cont. ANNEX 5

Spare parts for equipment:

Haldenwanger K.G. 1000 Berlin
Technische Keramik
für Forschung + Fertigung

500 pc.
size 2,85 x 12 x 8 H 13
Catalog Nr. 1580

Ströhlein + Co.
Fabrik chemischer Apparate
D-4000 Düsseldorf 1
Postfach 7829

for carbon + sulphur tester
type: VE 300, Catalog Nr. 1535

Analysis-Control proof 035-1/....

C:	1,310 %	(s = 0,015 %)	
Si:	0,210 %	(s = 0,010 %)	
Mn:	0,263 %	(s = 0,005 %)	
P:	0,0046 %	(s = 0,0013 %)	
S:	0,0118 %	(s = 0,0015 %)	Cat.Nr. 1410
ges.AL:	0,026 %	(s = 0,002 %)	
unlösl. AL:	0,007 %	(s = 0,001 %)	
As:	0,017 %	(s = 0,002 %)	
Cr:	0,071 %	(s = 0,004 %)	
Cu:	0,071 %	(s = 0,004 %)	
Mo:	0,006 %	(s = 0,002 %)	
Ni:	0,038 %	(s = 0,002 %)	
N:	0,0075 %	(s = 0,001 %)	

ANNEX 6

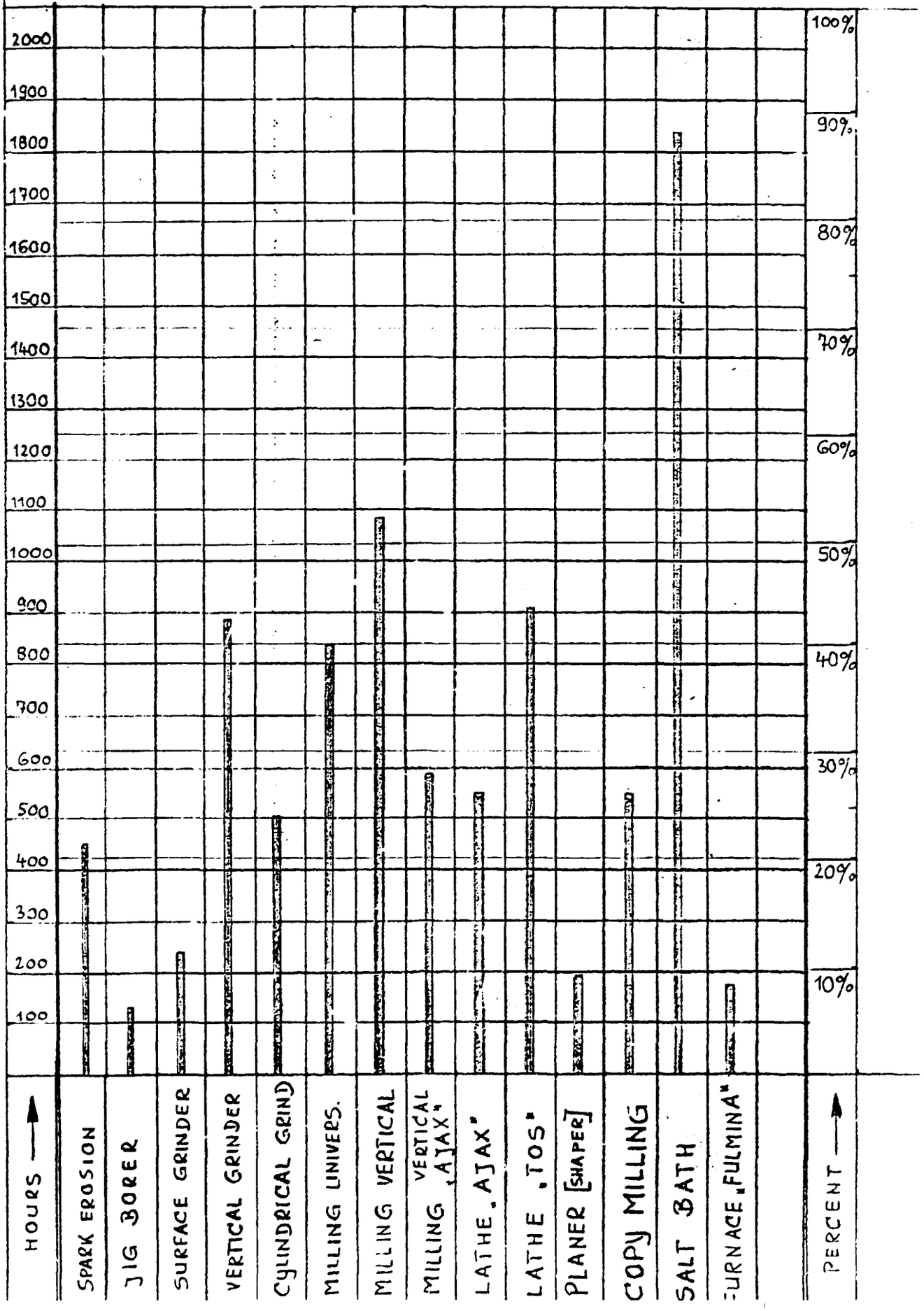
UTILIZATION of MACHINES in HOURS / %

YEAR / MACHINE	1980		1981		1982		1983		AVERAGE	
	h	%	h	%	h	%	h	%	%	
Spark Erosion	451	21	417	20	1.057	50	980	46	34	
Jig borer	137	6	108	5	96	5	190	9	6	
Surface Grinder	241	11	741	35	688	33	853	40	30	
Vertical Grinder	889	42	321	15	290	14	418	20	23	
Cylindrical Grinder	501	24	413	20	346	16	408	19	20	
Copy Milling	547	26	553	26	649	31	1.198	57	35	
Milling TOS	840	40	1.097	52	663	31	788	37	40	
Milling	1.089	52	1.122	53	946	45	1.408	67	54	ϕ41
Milling AJAX	589	28	722	34	518	25	681	32	30	
Lathe AJAX	550	26	73	3	51	2	42	2	8	
Lathe TOS	905	43	672	32	949	45	1.029	49	42	ϕ25
Tool Grinder	—		—		—		—			
Planer (Shaper)	197	9	473	22	106	5	85	4	10	
AVERAGE		27		26		25		35	28	
Salt bath	1.836	87	803	38	202	10	86	4	35	
FULMINA Furnace	175	8	233	11	316	15	800	38	18	
Forging hammer	—		—		—		—			
Friction press	—		—		—		—			
Eccentric press	—		—		—		—			

average working hours/year = 2.108

MACHINE + EQUIPMENT UTILIZATION in hours and %

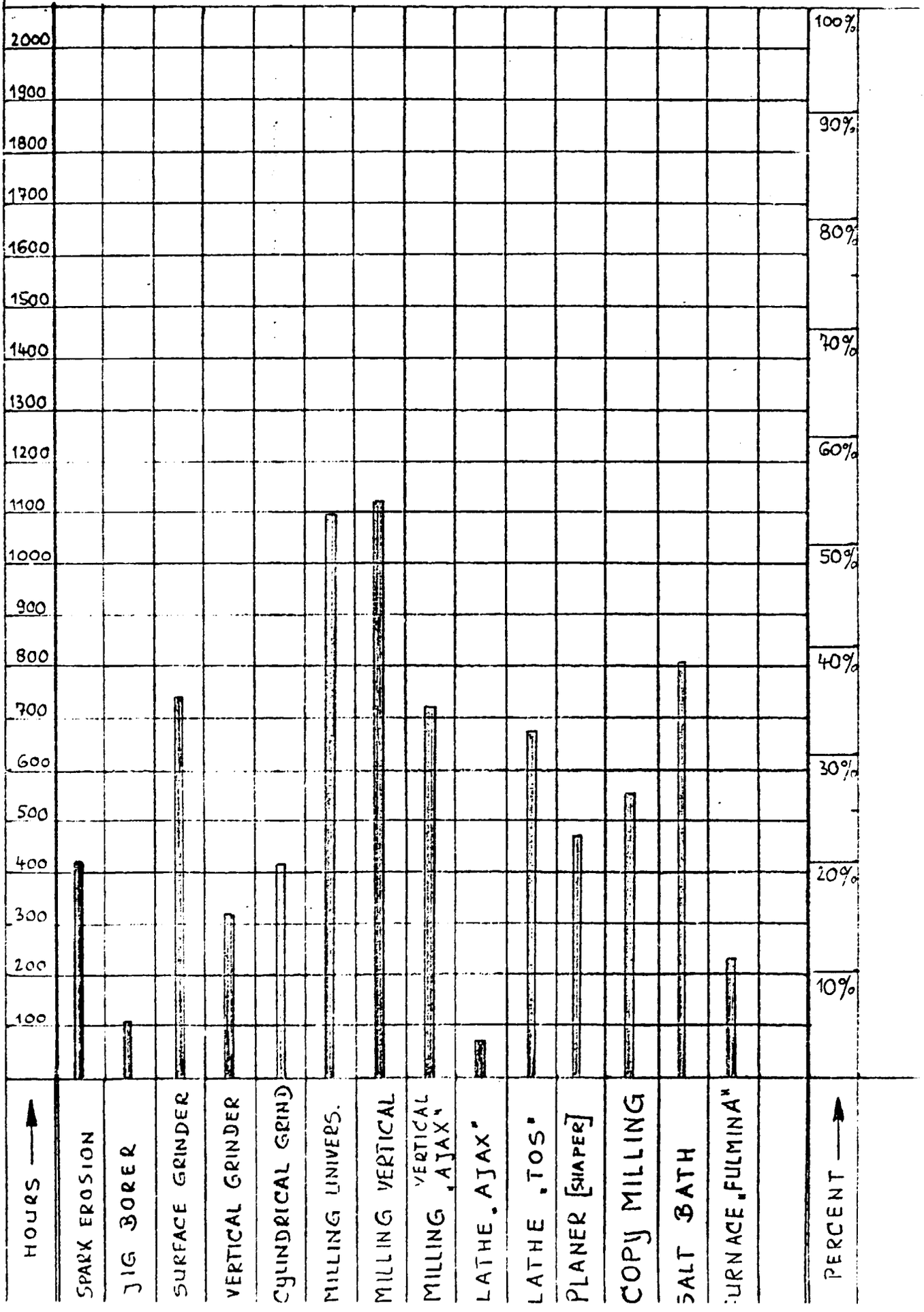
1980



ANNEX 6

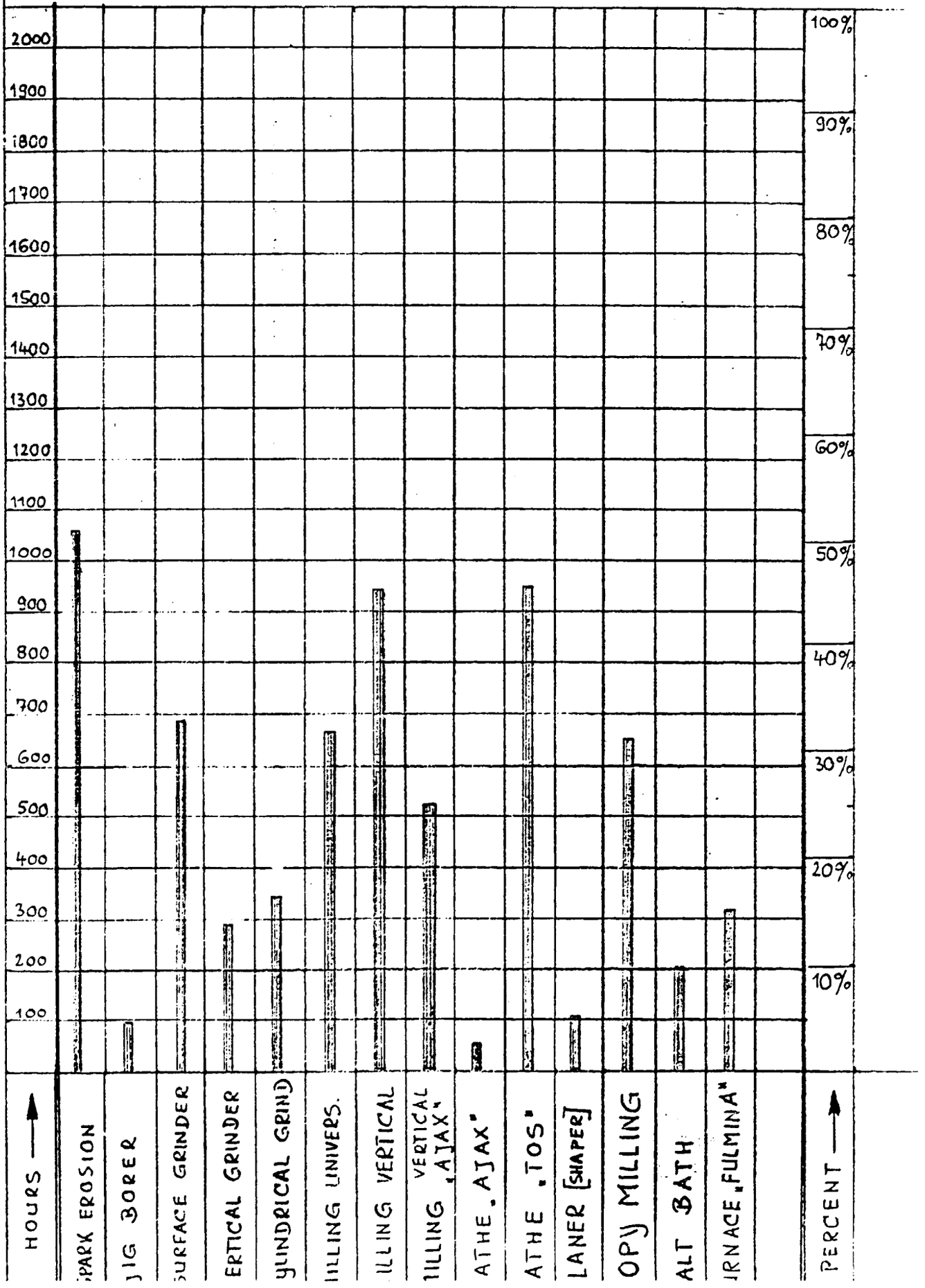
MACHINE + EQUIPMENT UTILIZATION in hours and %

1981



MACHINE + EQUIPMENT UTILIZATION in hours and %

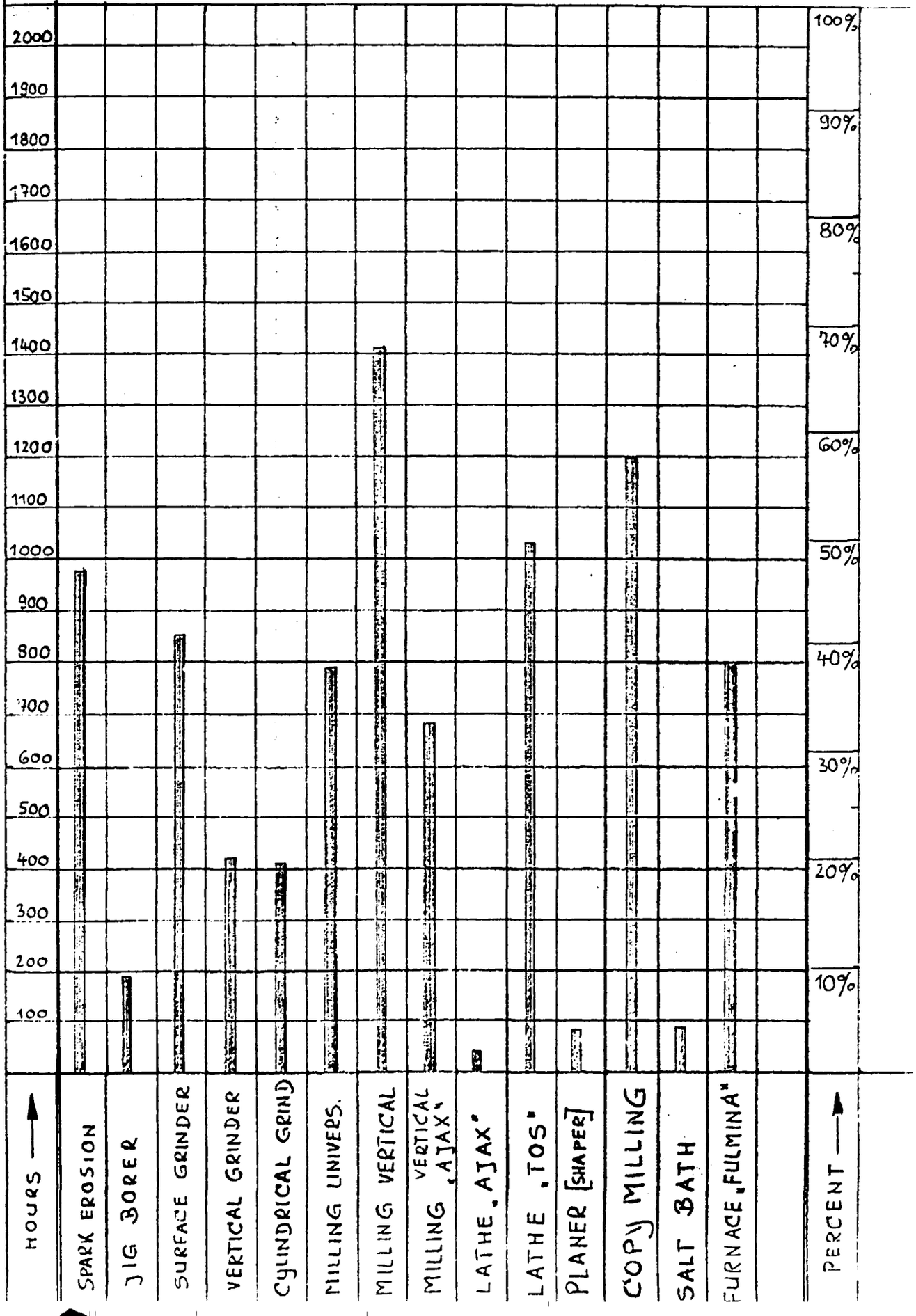
1982



ANNEX 6

MACHINE + EQUIPMENT UTILIZATION in hours and %

1983



ANNEX 7

RECOMMENED REPAIR OF MACHINES

Lathe TOS TYPE SN 45 B YEAR 1973	Leadscrew worn out all spindelmovements inaccurate due to wear. general overhaul
Lathe AJAX Type CIOM Year MADE IN BULGARIA	Gears for leadscrew totally destroyed. Once replaced but improper This machine should be replaced, a general overhaul will not bring a satifying result.
Universal Milling m/c T O S Type FA 4 AU Year	Machine general in good working order, exept movement spindles are worn out. Replacement of the spindles.
Vertical Milling m/c AJAX Type AJT 4 Year	general in good working order, exept inaccurate table movement Replacement of spindles and adjust- ment of slide-ways.
Jig Borer M A N E X Type m Year	the measurement system is in INCH. The machine is therefore not used accordingly. Recommendet is change of the measurement system into METRIC
Vertical Surface Grinder ZOCCA Type RPUA (1100 14 6880) Year	The movement of vertical grinding head is stepwise. The defect can be caused by the hydraulic system or in the guide way. Recommended: Service Eng. of the Manu- factorer should be called for defect analysis.

cont. ANNEX 7

Tool grinder August von der Ley Type A 1 4 Year	The machine generally doesn't meet the requirements. Resharpening of milling cutters of different forms and shape is not possible. The table-guideways and the spindle bearings are worn out. Recommended: machine overhaul and using afterwards for simple work. New Universal Tool Grinder should be provided.
Hardening Furnace FULMINA Model: KES-8-so-SG Year	All heating bars are broken. Replacement was required by the consultant and followed up by KÜSGET Estimated costs appr. 45.000 US $

ANNEX 8

MACHINES and EQUIPMENT
recommended as additional equipment for the
KÜSGET-workshop

Specification	Estimated costs US $ (ex factory)
UNIVERSAL TOOL and CUTTER GRINDER. for reconditioning of all kind of cutting, boring, milling, taping, drilling tools, with accessory devices for cylindrical and surface grinding This machine will not only be of use for the workshop it also will be of value for service to enterprises within Gaziantep. There is no similar m/c.	45.000
Recommended Machine: Type UW II Manufacorer: SAACKE, Pforzheim, West Germany	
HIGH-SPEED MECHANICS LATHE working range appr.180 mm dia x 800 mm length spindle speed appr. 30 to 2.000 rpm cooling equipment, accessories,	12.000
Recommended Manufactorer: Colchester or M 600 England	
UNIVERSAL WELDING EQUIPMENT for MIG-MAG/WIG-TIG/Electrodes/spot welding with such universal equipment all kind of welding work could be done, especially protective welding of machine parts.	4.500
Recommended Supplier: Hahn + Kolb, Stuttgart FRG	
HIGH SPEED GRINDING AND FILING MACHINE with flexible steel shaft rpm appr. 20.000, infinitely varibale, with two complete sets of tools for milling, grinding, filing, polishing	1.200
HYDRAULIC PIPE BENDER hand operated, for pipe dia 1/2" to 3"	700
SPRING WINDING DEVISE for wire dia. up to 3 mm	300
	63.700

ANNEX 8A

MACHINES
demanded by KÜSGET additional to the
recommended ones

Specification	Estimated costs US $
UNIVERSAL COPY MILLING MACHINE CNC DECKEL working range appr. 300 x 600 mm	80.000
SPARK Erosion MACHINE working range appr. 400 x 600 mm	80.000
LATHE working range appr. dia 500 x 1500 mm	20.000
	180.000

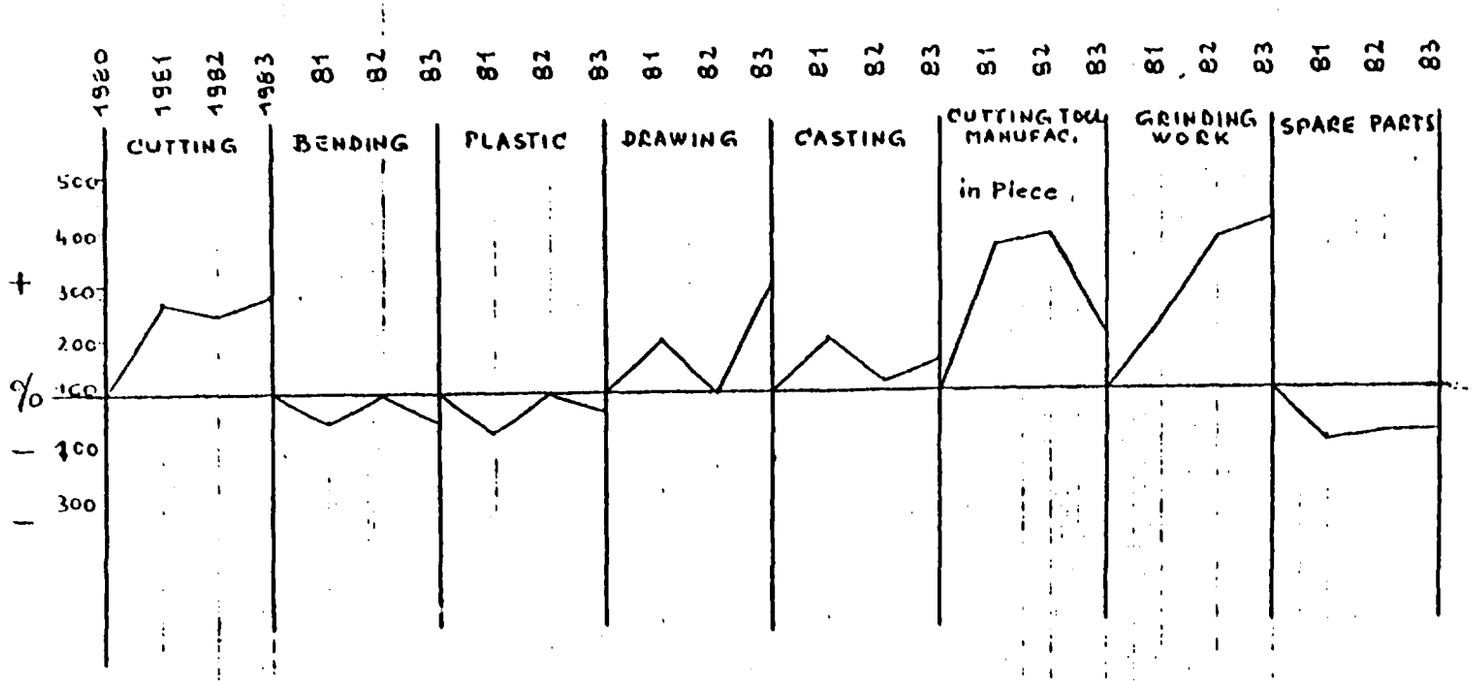
ANNEX 9

Developement in manufactoring of Dies

YEAR 1980 = 100%	1980	1991		1982		1983	
	piece	piece	%	piece	%	piece	%
Cutting	6	16	267	15	250	17	283
Bending	4	2	50	4	100	2	50
Drawing	0	1	100	0	0	3	300
Casting	0	5	100	1	20	3	60
Cutting tool manufactoring	33	368	1.115	390	1182	107	324
Plastic dies	7	2	28	7	100	5	71
Spare parts	2.273	212	9	299	13	429	19
Grinding work	287	663	231	1.096	382	1,172	408
			⌀ 238		⌀ 256		⌀ 189

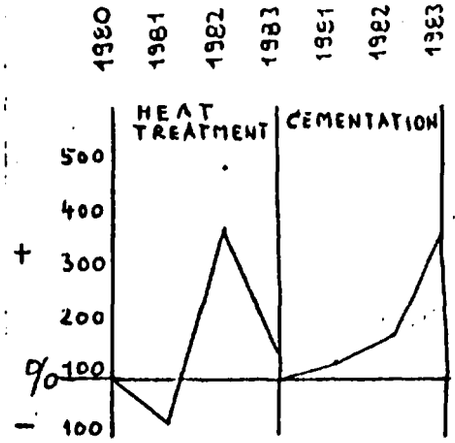
	kg	kg	%	kg	%	kg	%
Heat-treatment	2.022	516	25	7.778	385	3.156	156
Cementation	521	698	134	953	183	1.895	364
Total	2.543	1.214	⌀ 48	8.731	⌀ 343	5.051	⌀ 199

Developement in Die Manufacturing



MTL
JAN. 84
ANNEX 12

Developement Heat-treatment section



ANNEX 9

ANNEX 10

Design section activities

YEAR	1980	%	1981	%	1982	%	1983	%
Cutting Die Design	15	46	19	73	15	48	9	20
Bending "	7	21	2	8	3	10	1	2
Drawing "	2	6	1	4	1	3	3	6
Plastic Mould "	8	24	1	4	7	23	3	6
Various "	1	3	3	11	5	16	26	55
Metal injection "							4	9
Cast iron Mould "							1	2
Total	33	100	26	100	31	100	47	100

The report is based on the information given by the following persons:

Mrs. Hatice Yalim	General Director	SIDO
Mr. Murat Bursa	Deputy Director	SIDO
Mr. Ahmet Büyükhatipola,	Director of KÜSGET	
Mr. Mustafa Öztürk	Vice Director of KÜSGET	
Mr. Turgut Bosnak	Vice Director of KÜSGET	
Mr. Mehmet Parlar	Chief of the workshop of KÜSGET	
Mr. Metin Inan	Chief of the laboratory of KÜSGET	
Mr. Ihsam Özboz	Workshop coordinator of KÜSGET	

The expert would like to express his gratitude for the kind cooperation to all of the named persons as well as to everybody who assisted him in gathering information.