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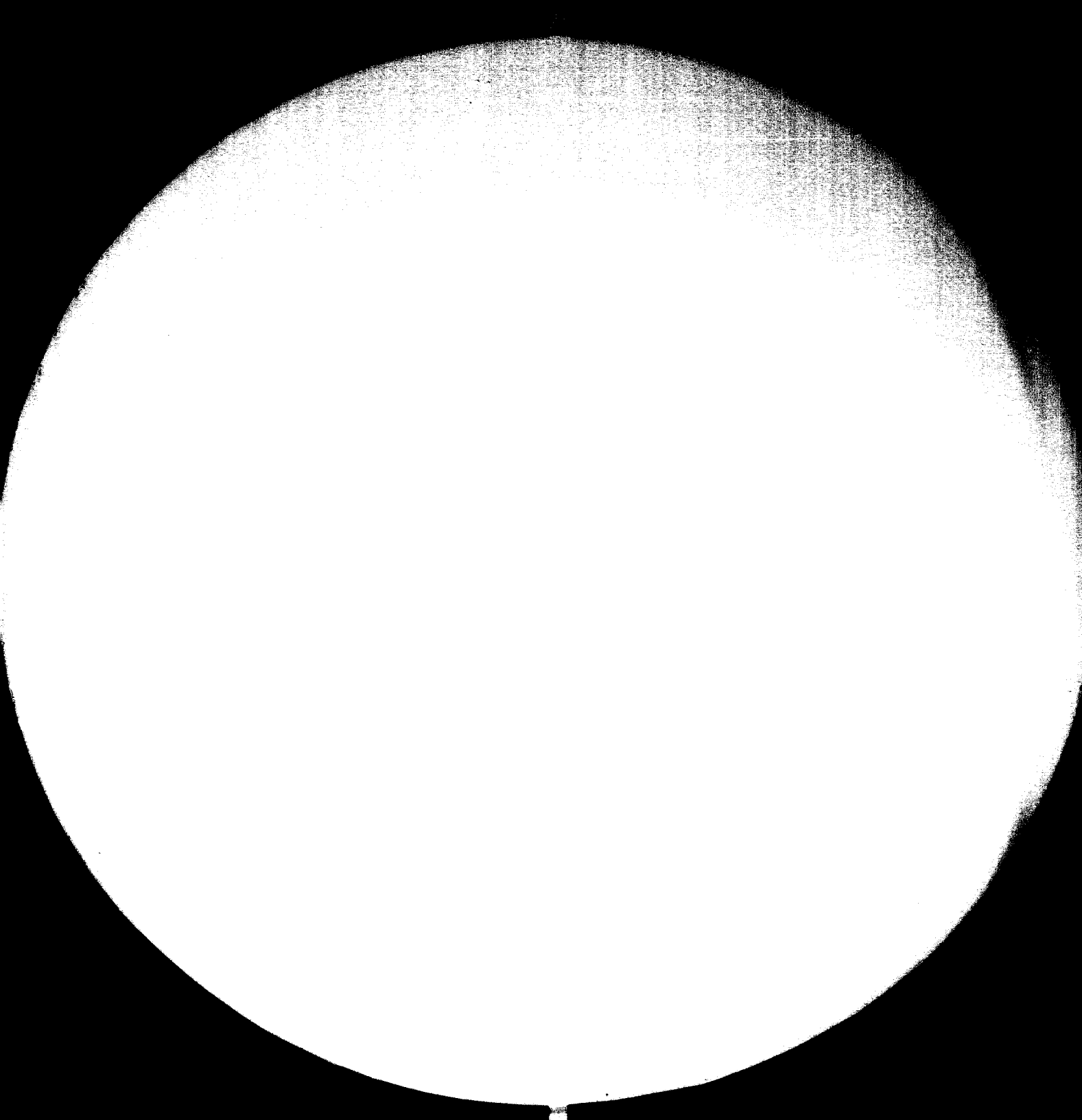

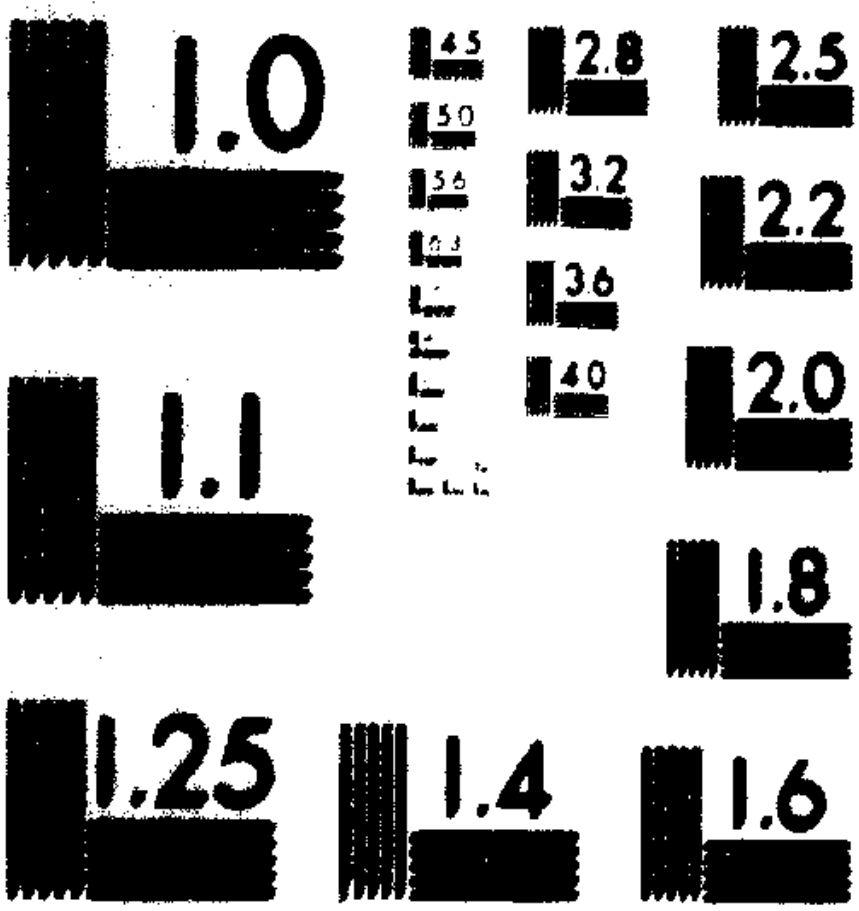


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# PRODUCTION AND TRAINING CENTRE FOR THE MANUFACTURE OF LEATHER FOOTWEAR AND LEATHER GOODS,

SM/PDY/76/015

DEMOCRATIC YEMEN

Terminal report

Prepared for the Government of Democratic Yemen
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Odd E. Birkhaug, project manager

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United Nations Industrial Development Organization
Vienna

## Explanatory notes

References to dollars ($) are to United States dollars.

The monetary unit in Democratic Yemen is the dinar (YD), and there are one thousand fils to a dinar. During the period covered by this report the value of the dinar in relation to the dollar was YD 0.350 = $1.

A full stop (.) is used to indicate decimals and a comma (,) is used to distinguish thousands.

Use of a hyphen between dates (e.g. 1977-1978) indicates the full period involved, including the beginning and end years, except for 1979 when the period finished in May at the end of the project.

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## ABSTRACT

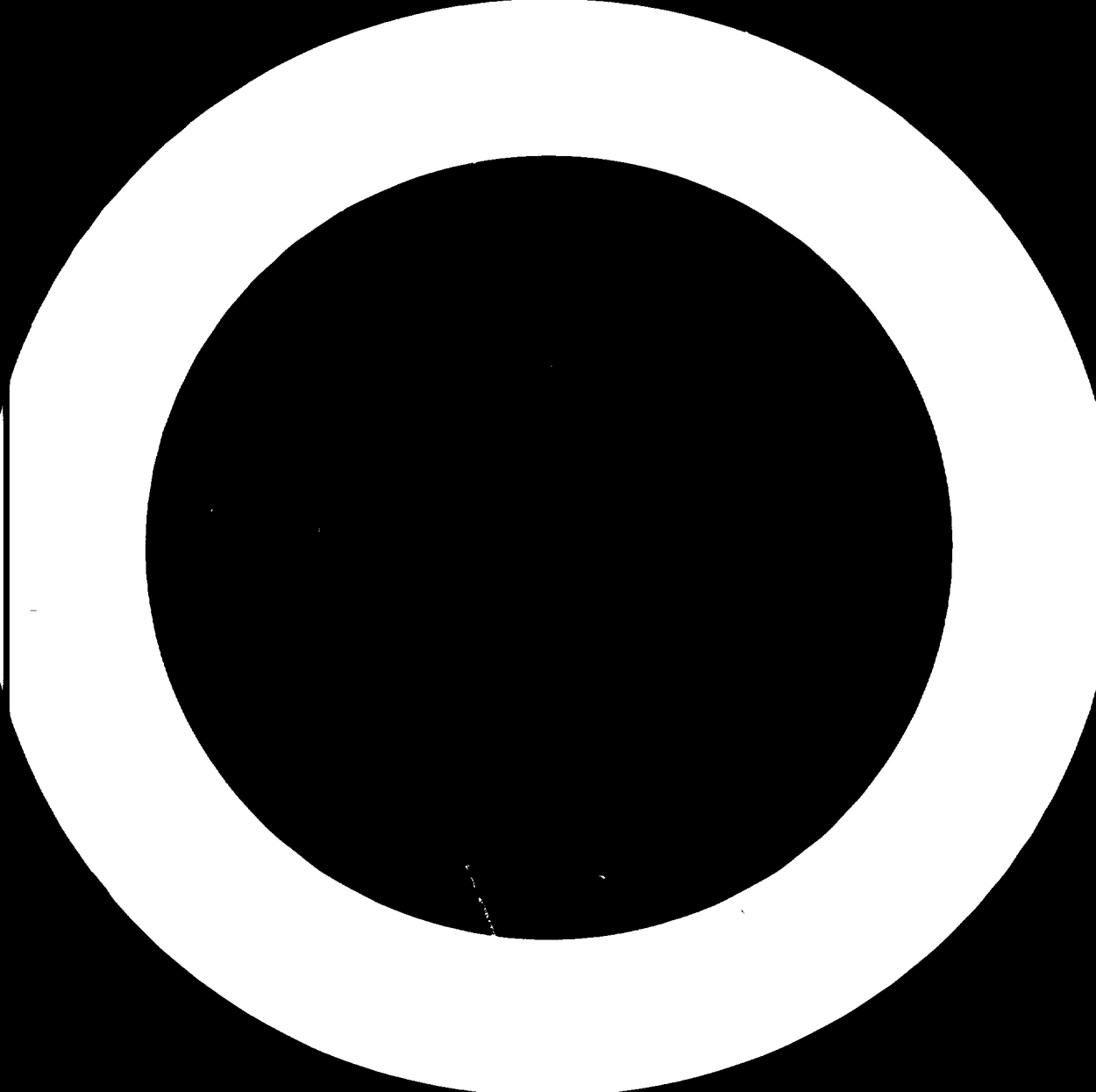
The United Nations Development Programme (UNDP) project "Production and Training Centre for the Manufacture of Leather Footwear and Leather Goods" (SM/PDY/76/015) was started in Democratic Yemen in February 1977 and completed in May 1979. The United Nations Industrial Development Organization (UNIDO) was the executing agency.

The main duties of the expert were to supervise the running of the original Training Centre, to develop it into a production unit for footwear, to improve managerial and technical expertise and to prepare a study on the feasibility of starting a new centre for injection moulded footwear.

The estimated number of 180 trainees in 1978 was not realized although many persons were retrained. No training took place in 1979 because graduate courses were extended from two to three years.

The planned production figures for the years 1977-1979 were not reached because of a shortage of labour and raw materials, absenteeism and late delivery of machinery. However, there was a steady increase in production from 29,121 pairs of footwear in 1977 to an estimated 120,000 in 1979 and the Centre is now selling its products at competitive market prices.

Managerial and technical staff have been trained to operate the Centre and production results are satisfactory. As shortage of labour is a general problem in Democratic Yemen it is not recommended that another centre for injected moulded footwear be opened in spite of a ready market. It is recommended that an expert be engaged for the next two to three years to serve in an advisory capacity for a period of up to three months each year to solve any future managerial or technical problems.



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# INTRODUCTION

## Project background

The Government of Democratic Yemen, in line with its policy of expanding light industry, decided to establish the Training Centre for the Manufacture of Leather Footwear and Leather Goods. In September 1971 a request for assistance was submitted to the United Nations Development Programme (UNDP) and field operations were approved in July 1972. The project manager at the time drafted a project document details of which were approved in May 1973 by the Government, UNDP and the United Nations Industrial Development Organization (UNIDO), the latter being the executing agency. The duration of the first phase of the project was for a period of three years until June 1975 under project DP/PDY/71/514 but was later extended by 18 months to the end of 1976.

In the initial period from July 1972 to June 1975, the UNDP/UNIDO contribution was $305,000 and that of the Government was YD 97,000. After the mid-term review when the project was extended for another 18 months, the UNDP/UNIDO contribution was raised to $350,000 although final expenditure only amounted to $336,543, whereas the government contribution remained stationary.

One of the reasons for starting the Centre was that raw materials for upper and lining leather were to be supplied by the National Tannery in Sheikh Othman, which was reactivated in 1972. It was estimated that skins and hides of 120,000 head of livestock could be provided annually.

The second phase of the project (SM/PDY/76/015) was started in February 1977 with the arrival in Aden of a new project manager, appointed for an initial period of 18 months, extended for another 6 months until March 1979 and finally for a further two months until the end of May 1979. Annex I gives the members of the project team.

The financial contribution by the Government during the second phase of the project from February 1977 to May 1979 was YD 107,000 (approximately $306,000) which included YD 10,000 for insurance, clearance, etc. The total contribution by UNDP/UNIDO was $207,685 made up of $54,437 for 1977, $119,743 for 1978 and $33,505 for 1979.

During the second phase the Centre was extended to include production and training, and a building in the industrial area of Ma'alla, Aden, was provided by the Government. A number of improvements were carried out to allow better storage facilities, and four adjacent buildings were rented, one of which was to serve as a retail outlet. The existing facilities are adequate for the production of up to 1,000 pairs of shoes, boots and sandals per day. Land bordering on the present factory with an area of 1,494 $m^2$ would prove ideal if future plans for an injection moulding plant and storage rooms for raw materials and finished products were approved.

## Objectives

The immediate objectives of the project were as follows:

(a) To continue the activity of the Training Centre for the Manufacture of Leather Footwear and Leather Goods;

(b) To extend the functions of the Centre by manufacturing women's footwear and injection moulded footwear;

(c) To train supervisory, technical and managerial staff in modern technology;

(d) To introduce modern techniques, methods, and processes and train personnel to handle equipment used in the manufacture of women's and injection moulded footwear, as well as other leather products;

(e) To organize and manage production, quality control and training;

(f) To prepare a feasibility study on the possibility of opening a new centre for injection moulded leather footwear.

The reason for extending the Centre to include the manufacture of footwear and leather goods was to cover training and operating expenses. Raw materials for upper leather and leather lining would be provided by the state-owned National Tannery, and all materials and accessories would be purchased locally or imported by the Government.

The main objectives of phase I and II of the project were to train personnel to a higher level of skill and productivity to meet the needs of the local market for men's, women's and children's footwear and to enable the country to become self-sufficient in the production of leather footwear and leather goods. The success achieved can be seen by the decrease in imported children's and men's footwear between the years 1977 and 1979, as shown in table 1.

Table 1. Footwear imports, 1975-1979
(Pairs)

| Type | 1975-1976 | 1977-1978 | 1979 |
|---|---|---|---|
| Children's | 93 500 | 48 000 | - |
| Women's | 200 000 | 102 000 | 125 000 |
| Boy's | 190 000 | 94 000 | 100 000 |
| Men's | 19 865 | - | - |

Material costs vary between 30% and 50% and considerable saving in foreign currency can be achieved by producing locally manufactured goods, in fact, up to $1.5 million yearly, based on a daily output of 1,000 pairs of footwear per day.

## RECOMMENDATIONS

1. Six graduate technicians from Ma'alla Technical College should be trained, four in the cutting, closing, lasting and bottom stock departments and two to work in conjunction with the production manager and his assistant. This would enable them to assume important technical positions in the plant within two years.

2. The Centre would have reached the 1978 production target had sufficient manpower been available. Since lack of manpower is a general problem, the Government should not establish another Centre for the production of injection moulded footwear at present. Should the labour position improve in future years the situation should be re-evaluated as there is a ready market in the country for this type of footwear.

3. Managerial, administrative and technical staff have been trained to a level where they can operate the Centre without outside assistance, and the mechanic is sufficiently experienced to ensure that all machines and equipment are operational. During the duration of the project constant changes in personnel occurred but it is recommended that in future personnel remain in their present positions to give them more security and a feeling of responsibility, thereby maintaining a high quality level.

4. New working hours are recommended for the factory to overcome the difficulty of late arrivals in the morning and to increase production level in the afternoon hours. Work should start at 7.30 a.m. and finish at 3.30 p.m., with a half-hour break at 11.30 a.m.

5. An international exhibition of shoe production took place in Pirmasens (Federal Republic of Germany) in May 1979. It is held every three years and it is strongly recommended that the Centre take part in order to keep up with the latest information from leading footwear manufacturers on machines, materials and processes.

6. At present employees have four weeks annual leave which can be taken at any time throughout the year. This means that on average 8% of the labour force is absent at one time and it is recommended that the Centre close down completely for one month, either June, July or August, except for some maintenance and storekeeping staff who could take leave at a later date. They could grease and check all motors, change clutches where necessary, overhaul all machinery and take stock. Painting and repair work could also be attended to.

7. The shoe industry is a constantly changing industry as far as lasts, styles, upper and bottom materials and components are concerned. New machines and equipment are continually being marketed and it is absolutely essential that management keep up with the latest developments in their field. It is therefore recommended that the manager and the production manager or his assistant visit shoe centres abroad at periodic intervals to study all types of materials, machines, processes, production card systems etc. The present assistant production manager should be granted a fellowship for at least a year's training abroad. Initial contact has already taken place with firms in the United Kingdom where he could study production methods on various machines, card systems, and enhance his mechanical knowledge. A training course for sewing machine mechanics is also recommended, preferably at the Pfaff factory in the Federal Republic of Germany as well as a course for other footwear machinery at British United Shoe Machine Company in the United Kingdom, both of which would improve the mechanical standards at the Centre.

8. The pattern cutting department has only one competent pattern maker and it is recommended that as soon as another English or Italian speaking candidate is found he be sent on a three month fellowship to Ars Sutoria in Italy.

9. It is recommended that the Government, either through private concerns or UNIDO, engage a shoe manufacturing expert to serve in an advisory capacity for at least 3 months per year to solve any future managerial or technical problems. This person should be practically and technically familiar with all types of machines.

10. Temperatures in the factory rise to 45°C during the summer months, one of the causes being the present iron roofing which leaks in several places and is in need of extensive repair. It is recommended that instead of costly repairs it be replaced with new aluminium sheeting to reflect the heat.

11. Good fluorescent lighting should be installed in the Centre as soon as possible.

# I. FINDINGS

## Organization

The figure outlines management, administration and technical departments and table 2 lists administrative personnel from 1977 to 1979. During the period, absenteeism ranged from 10% to 25%.

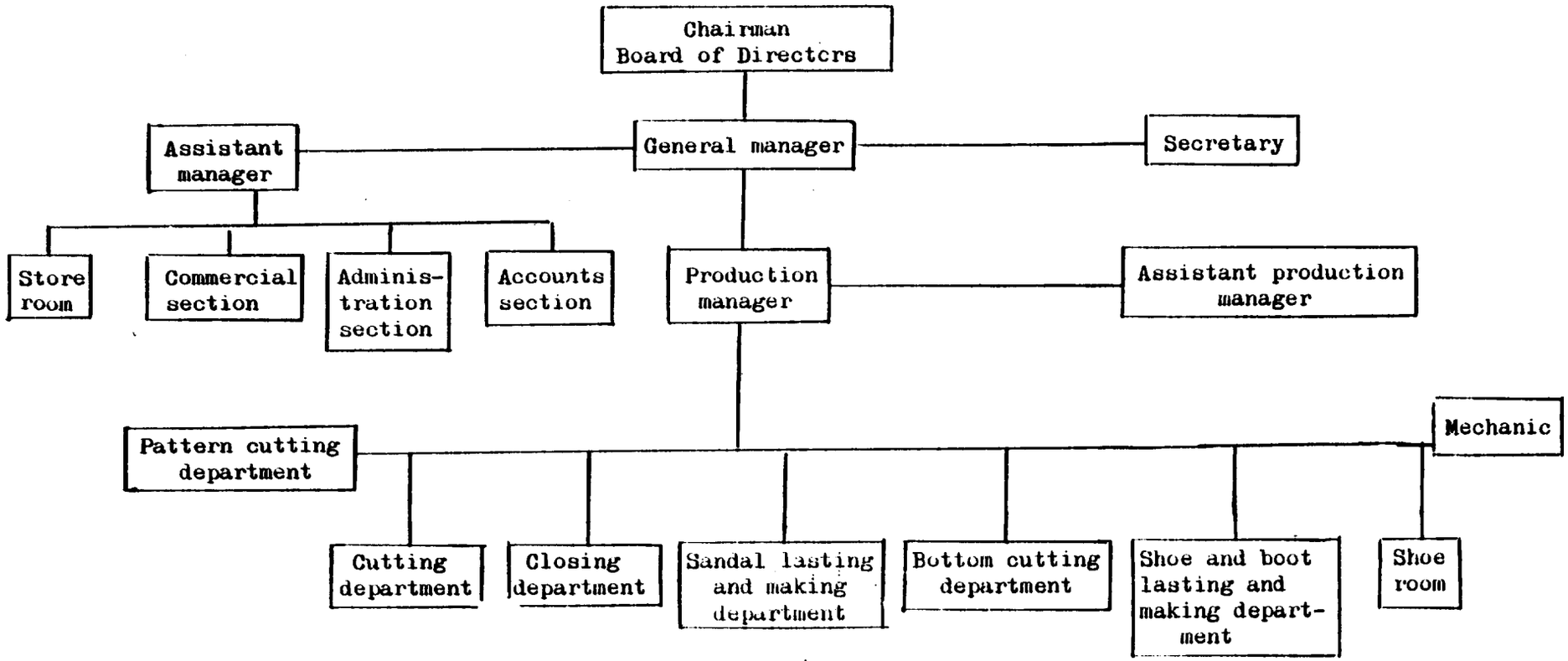
Table 2. Administrative personnel, 1977-1979

| Position | Name | Period employed |
|---|---|---|
| General Manager | Abdulla Bin Taweel | July 1976 - August 1977 |
| General Manager | Fadhle Hasson Yehia | August 1977 |
| Assistant Manager | Abdul Razack Mohyddin | August 1977 |
| Production Manager | Saeed Mansoor | July 1974 |
| Assistant Production Manager | Ismail M. Abdulkarim | October 1977 |
| Accountant | Abas Abdul Rehman | January 1977 - June 1977 |
| Accountant | Ahmed Farea Hizam | July 1977 |
| Commercial Supervisor | Ahmed Mohamed Musleh | May 1974 |
| Administration Officer | Ahmed Nagi Saeed | January 1977 - June 1977 |
| Administration Officer | Ahmed Mohamed Hussein | June 1977 - June 1978<br>November 1978 |
| Storekeeper | Hasson Moqbel | January 1977 - March 1977 |
| Storekeeper | Hamed Jaber Fadhle | April 1977 - October 1977 |
| Storekeeper | Abdul Hamid Moh'd Taresh | October 1977 - June 1978 |
| Storekeeper | Mohamed Omer Jobeh | August 1978 |
| Clerk | Amal Ibrahim Saleh | December 1973 |
| Clerk | Adel Abdulla Maroof | April 1975 |
| Clerk | Ismahan Hussein Abdulla | October 1975 |
| Clerk | Hamed Jaber Fadhle | October 1977 |
| Clerk | Aneesa Saeed Abdulla | December 1976 |
| Secretary | Intisar Ahmed Joman | February 1976 |

Job descriptions for personnel in managerial and supervisory positions were prepared giving clear guidelines of the responsibility and authority accorded each position.

Purchase of machines and materials was supervised by the assistant manager and the commercial supervisor and involved clearing import papers related to shipments as well as letters of credit. This section was run efficiently and mention should be made of the assistance given by the Ministry of Industry and the co-operation shown by the chairman of the Centre.

Management, administration and technical departments



During 1977-1978 criticism of the account section emanated from the audit department of the Ministry of Industry with particular regard to payments and bookkeeping and in May 1979 the ministry decided to introduce new accounting procedures. This explains why no balance sheet was produced in spite of repeated requests by the project manager in order to assess the true financial position of the Centre at the end of the project.

The number of administrative personnel was excessive. It could be reduced greatly by increasing efficiency and combining jobs.

In 1978 the assistant production manager took charge of production planning. To improve faulty registration, a more competent person was appointed in October of the same year to record incoming orders and daily production figures of the various departments.

Many changes of storekeepers proved necessary (see table 2). Because of failure or incorrect registration of incoming and outgoing materials confusion resulted and not until August 1978 when a new storekeeper and an assistant were appointed did registering improve.

The lack of production supervisors and, to an even greater extent, of quality controllers was felt throughout the second phase of the project. On numerous occasions the project manager requested that the Ministry of Industry recruit graduates from the Ma'alla Technical College in Aden to obviate the difficulties faced by the Centre in maintaining a uniform quality level of production. At least six graduates were needed to be trained for quality control and for technical supervisory positions. Unfortunately recruitment did not materialize mainly because in 1978 courses at the college were extended from two to three years.

The need for trained technicians was made clear to the Minister of Industry at the official opening of the Centre on 10 October 1978, as well as to his successor during the latter's visit to the Centre on 14 January 1979.

The production manager, in close co-operation with the project manager worked on all phases of shoe production including specialized training in pattern cutting. Unfortunately ill-health necessitated his hospitalization for more than six months during 1978 and 1979 and for another two months in the United Kingdom while attending a training course.

A new electrician was appointed in October 1977. He showed great interest in all phases of production and by working many hours overtime reached a level of technical competence which enabled him to become an assistant production manager by 1979.

Some changes occurred in supervisory positions. In the upper leather cutting department the supervisor resigned in January 1978 and it was nine months before a replacement could be found and trained; he currently holds the position. The bottom cutting and closing departments retained their supervisors throughout second phase of the project and a supervisor was appointed when the sandal section was established in January 1978. In the lasting and making section both the supervisor and his assistant were called up for military service in February 1979 as were the mechanic and the pattern cutter.

Most of the people employed in a supervisory capacity are well trained but they are having to take a more active part in production because of the acute shortage of labour.

## Employment

The Ministry of Labour was responsible for directing the labour force but since 1977 difficulty was experienced in obtaining suitable personnel for a number of specialized jobs, e.g., upper leather cutting, certain closing operations and specific jobs in the lasting and making department. The result was that the Centre had little choice in selecting candidates to fill vacancies. In 1978 the situation had deteriorated to such an extent that new machinery could not be fully utilized.

As a last resort the prison authorities were contacted and they agreed to inmates working at the Centre on condition that they were escorted to and from work by the Centre's staff. Eleven started in May 1978 and most were trained in sandal production. They were well accepted by the other workers and in most cases carried out their duties competently in spite of the fact that few had had any previous experience. However, the Government periodically granted amnesty to prisoners and although the agreement had been that the Centre would be given persons with at least two to three year sentences to ensure continuity, the result was that, on average, few inmates remained for more than a few months.

The varying number of personnel proved to be a continual problem throughout the duration of the project. There were 132 employees in January 1977 as against 103 in March 1979, as table 3 shows.

The planned labour force and production for 1978 are shown in table 4, and the actual production figures to 1977-1979 are listed in table 5. The plan was based on the assumption that all machinery and equipment listed on 1 August 1977 was installed and operational. Most of the machinery ordered had arrived by October 1978 but by then there was a shortage of between 40-50 employees resulting in the estimated production target not being reached. This situation remained unchanged at the end of the project in May 1979.

Table 3. Personnel employed and total monthly wages paid during 1977-1979

| Month | Personnel | | | | Total wages (YD) |
|---|---|---|---|---|---|
| | Administration | Management | Technical | Total | |
| 1977 | | | | | |
| January | 23 | 7 | 102 | 132 | 2 988 |
| February | 27 | 7 | 100 | 134 | 2 883 |
| March | 21 | 7 | 114 | 142 | 2 956 |
| April | 28 | 7 | 102 | 137 | 2 905 |
| May | 27 | 7 | 92 | 126 | 2 912 |
| June | 25 | 7 | 88 | 120 | 2 714 |
| July | 25 | 7 | 91 | 123 | 2 729 |
| August | 27 | 7 | 91 | 125 | 2 059 |
| September | 24 | 7 | 76 | 107 | 2 449 |
| October | 26 | 7 | 78 | 111 | 2 393 |
| November | 19 | 7 | 79 | 105 | 2 836 |
| December | 27 | 7 | 75 | 109 | 2 779 |
| 1978 | | | | | |
| January | 23 | 7 | 74 | 104 | 2 590 |
| February | 22 | 7 | 77 | 106 | 2 724 |
| March | 22 | 7 | 78 | 107 | 2 764 |
| April | 23 | 7 | 78 | 108 | 2 894 |
| May | 23 | 7 | 82 | 112 | 3 199 |
| June | 24 | 7 | 100 | 131 | 3 393 |
| July | 21 | 7 | 94 | 122 | 3 258 |
| August | 22 | 7 | 92 | 121 | 3 198 |
| September | 22 | 7 | 101 | 130 | 3 446 |
| October | 22 | 7 | 97 | 126 | 3 280 |
| November | 21 | 6 | 97 | 124 | 3 454 |
| December | 21 | 6 | 93 | 120 | 3 451 |
| 1979 | | | | | |
| January | 21 | 6 | 82 | 109 | 3 403 |
| February | 20 | 5 | 88 | 113 | 3 256 |
| March | 20 | 4 | 79 | 103 | 3 262 |

Table 4. Planned labour force and production, 1973

| Quarter | Month | Labour force | | Production (pairs) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Monthly, all footwear | Quarterly | | |
| | | Sandals | Shoes and boots | | Sandals | Shoes and boots | All footwear |
| | January | 250 | 150 | 9 600 | | | |
| First | February | 250 | 150 | 8 400 | | | |
| | March | 250 | 150 | 9 600 | 17 125 | 10 275 | 27 400 |
| | April | 350 | 200 | 13 200 | | | |
| Second | May | 350 | 200 | 13 200 | | | |
| | June | 350 | 200 | 11 275 | 23 975 | 13 700 | 37 675 |
| | July | 400 | 300 | 17 500 | | | |
| Third | August | 400 | 300 | 17 500 | | | |
| | September | 400 | 300 | 14 350 | 23 200 | 21 150 | 49 350 |
| | October | 400 | 400 | 19 200 | | | |
| Fourth | November | 400 | 400 | 14 300 | | | |
| | December | 400 | 400 | 13 400 | 26 200 | 26 200 | 52 400 |
| | | | | | Total | | 166 325 |

Table 5. Actual footwear production, 1977-1979
(Pairs)

| Year | Quarter and month | Output |
|---|---|---|
| 1977 | | 29 121 |
| 1978 | | 97 024 |
| | First | 13 495 |
| | January | 4 170 |
| | February | 3 960 |
| | March | 5 365 |
| | Second | 21 427 |
| | April | 4 581 |
| | May | 8 372 |
| | June | 8 474 |
| | Third | 31 312 |
| | July | 10 810 |
| | August | 10 149 |
| | September | 10 353 |
| | Fourth | 30 790 |
| | October | 10 268 |
| | November | 9 681[a/] |
| | December | 10 841 |
| 1979 (First four months) | | 34 296 |
| | First | 30 296 |
| | January | 11 841 |
| | February | 8 674 |
| | March | 9 781 |
| | Second | |
| | April | 4 000 |

a/Six production days lost in November.

## Payment systems

There are two payment systems in operation at the Centre, one on a monthly basis and the other on piece-rate, although the former was more widely used. Operators earned between YD 23,500 and YD 28,500 per month, supervisors between YD 30,000 and YD 36,000, the chief mechanic YD 42,500 and the production manager YD 56,000. The lowest salary scale was for cleaning staff who earned YD 18,000 per month, and the highest was for the general manager, who earned YD 80,000.

The other form of payment, piece-rate, enabled an average worker to earn approximately 20% more. This system was advantageous from the production point of view but was introduced only when operators were well trained. It is well known that when operators work on the piece-rate system they tend to become negligent, and strict quality control is necessary. However, the Centre did not have sufficiently experienced quality controllers and from bitter experience it was learnt that only certain operations could be run on this system, e.g. cutting synthetics, lasting sandals and certain closing and cementing jobs.

There was no time and motion expert at the Centre; time studies were carried out by the production manager and his assistant and based on the production time of several boxes containing 10 pairs of shoes or boots or 40 pairs of sandals. In addition to actual operational time, 10% extra time was allowed for bobbin winding, changing tools, pouring cement etc.

Upper leather cutters were paid an additional allowance of 3 fils per pair provided they keep within a certain waste limit, and personnel were rewarded annually with a bonus for outstanding work. This last occurred at the official opening of the new production line in October 1973 and it was decided that in future it should take place on 1 May each year. The value of the bonus ranged from 2-4 weeks salary.

## Machines and equipment

When the Training Centre was extended to include production of leather footwear in the second phase of the project, a number of considerations had to be taken into account, e.g. type of footwear to be produced, raw materials needed and styling and production methods, all of which were discussed with the Government officials concerned.

The estimated production figure was 1,000 pairs of footwear per day, provided all machinery and equipment was installed and operational. At least 160 personnel would be needed to achieve this output and no indication was given by the Government that any labour difficulties would arise.

Selection of machinery and equipment was finalized and tenders submitted to firms in Denmark, the Federal Republic of Germany, France, Italy and the United Kingdom.

In August 1977 an order for one Duo-Rail transporter for the lasting and making room was approved and at a meeting with government officials held in March 1978 justification for ordering other vital machinery was presented to the Ministry of Industry. In April 1978 YD 30,000 was approved for this purpose. Total outlay by the Government for machinery and equipment during 1977-1979 was YD 107,000, and by UNIDO $50,074.

Tenders for machinery and equipment began arriving in May 1977 and were evaluated on the basis of quality, output and price. The manager of the Centre and the project manager spent three weeks in Europe studying machinery and materials and contacting manufacturers. Machinery was then ordered but it often had a delivery delay of over a year after a letter of credit had been issued e.g. post sewing machines with trimming devices for lining. Most machinery, however, had arrived by the end of 1978 and the last machine ordered by UNIDO was delivered in April 1979. Annex II lists machinery imported by the Government and UNIDO during 1977-1979.

Installation

At the end of the project in May 1979 a total number of 71 machines had arrived, 63 purchased by the Government and 8 by UNIDO. The mechanic and his assistant were responsible for the installation of this machinery and in doing so they built up good team work within the Centre, working in close co-operation with the foreman and operators of each department. Working principles for common mechanical, hydraulic and pneumatic systems were devised for operators, and when machinery arrived without being fully operational, it had to be stripped down entirely e.g. one hydraulic cutting press, one heel seat lasting machine and two sewing machines. This was a time-consuming operation but provided excellent training for all concerned.

Electric installation was delayed by very high tenders for this work and most machines were eventually connected by the Centre's electrician. The Duo-Rail transporter was wired by technicians from the British company responsible for its delivery as well as that of other machinery in the lasting and making department.

Instructions for regular maintenance of machinery, e.g., changing oil on hydraulic machines, the compressor and machines with automatic lubrication such as the seam levelling machine and some sewing machines, were placed in a strategic part of the workshop.

As a number of the machines were pneumatically operated a piping system, for which a special plan was drawn up, had to be installed but this took months to complete as the contractor only worked on it periodically. On the Duo-Rail transporter piping was attached to the lower part of the machine whereas in other departments it was installed slightly below floor level. Because of the very high level of humidity in Democratic Yemen taps for water outlets had to be installed and all pneumatically operated machinery was fitted with filters to facilitate simple daily drainage.

The central air compressor was installed in a special unit opposite the main entrance to the Centre and a large window built into the wall to provide fresh air. A fan was also installed for cooling purposes. Although the compressor was equipped with a special water-separating system, extra drainage was provided and water pumped out at various points of the Centre to avoid oxidation of machinery.

Lighting

Lighting in the Centre was inadequate for work of good quality, particularly during morning and overtime hours. To improve conditions tube lighting was selected from tenders received. However, the order was not approved by the Ministry of Industry. Individual lighting for machines, especially in the closing room, was not available until October 1978 when the last order of Pfaff sewing machines arrived, but five machines were still without lamps at the end of the project. The result was that some operators suffered eye-strain, particularly when working with black material, and this may well have been one of the reasons for high absenteeism in the closing department.

## Working conditions

Determined efforts were made to provide the best possible working conditions during the time machinery was being installed but operators in the closing room worked in very cramped quarters and to improve the situation, adjustable chairs were ordered in November 1978. Arrangements should be made

to provide more water drinking facilities for staff to avoid wastage of working hours. The iron roofing is badly in need of repair and it is recommended that it be replaced by an aliminium roof, to lower temperatures inside the factory during summer; in addition, two large fans should be installed.

Work started at 7 a.m. and finished at 3 p.m. with a half-hour break at 9.30 a.m., except on Thursdays when work ended at 1 p.m., the last half hour being spent on cleaning machinery. Difficulties were experienced with late arrivals in the morning, workers extending their half-hour break and women getting ready to leave early, but the situation improved somewhat by the end of the project. The continuous five-hour stretch after the morning break is too long for efficiency; the break should be taken at 11.30 a.m.

## II. TRAINING

The acute manpower shortage in the country resulted in many inexperienced people being employed in administrative, supervisory and operational positions, thus extending the training schedule. Table 3 lists the monthly changes of staff which made training a continual process and necessitated more overtime hours for the project manager. Annex III lists the training courses that were given in 1977-1978.

### Pattern cutting department

In 1977 four people were employed in this department. Two were later transferred because of an insufficient work load and in 1978 only the pattern cutter remained when his assistant moved to the prefitting department as controller.

Practical training included making of last patterns, standard patterns for Oxford and Derby types of footwear, moccasins, elastic and buckle shoes, boots, and a variety of sandals for men, women and children. It also comprised grading of various types of footwear, cutting of zinc patterns and binding of cardboard patterns. Particular care was taken to improve production techniques, e.g. in making patterns for toe-caps and boots.

Practical demonstrations were held on how best to make perforating die-moulds on 6 mm red fibre plates using round punches, this being a particularly fast and economical way of making perforating tools for men and women's sandals. One or two dies usually sufficed for a series of patterns and proved faster and safer than using the perforating machine. Various means of calculating material consumption for different patterns were introduced, the parallelogram system being the one at present in use at the Centre.

### Upper leather cutting department

Eleven women were employed initially and they attained a fair knowledge of materials and cutting techniques. However, by the end of 1977 only two remained, some resigning for personal reasons, others being reassigned by the authorities.

Training was based on hand-cutting and the women first learned how to sharpen and maintain a good cutting knife and to cut by holding the knife at a right angle to the pattern. They were then trained to cut patterns from different kinds of leather, taking to account quality, stretch and low wastage level. Savings in material, particularly in the latter half of the project, were considerable and any leather left over from men's and women's shoes was used for specially designed children's sandals. This was one of the major achievements of the project.

Suede leather, used for boots and shoes, came in a variety of shades which made quality supervision a necessity to ensure correct matching. Each operator was instructed in the daily maintenance of his machine and the patterns he used were made of hardboard or zinc, the former steel-bound to avoid deformation.

When new cutting presses arrived in 1978 machine cutting replaced hand cutting. Training in pattern placing was of prime importance, and to achieve maximum production value a knowledge of quality classification, thickness, stretch etc., of hides and skins proved essential, as well as how best to cut two different patterns together. Personnel were instructed as to which defects in hides would not be visible after lasting and closing. Equipment for making cutting knives also arrived in 1978 and cutters were supplied with boxes in which knives were clearly marked, making selection easier.

## Prefitting department

Prefitting can be broken down into splitting, skiving, stamping, marking and control. Detailed instructions on the handling of all aspects of the splitting machine were issued to operators and few problems arose. With skiving, however, the situation was quite different because of frequent changes of operators during the second phase of the project. Much time had to be spent training the new operators how to set the various skives for different kinds and thicknesses of material, select the correct presser foot for different types of material, and sharpen the knives.

A more serious problem than lack of operators is the lack of proper supervision and control.

Work on the new lining stamping machine ran smoothly. Final control of output from the cutting department lay with the prefitting department, and a great deal of time was spent on training controllers to understand all aspects of materials and an acceptable quality level.

All work in the cutting, prefitting and closing departments is transported in special plastic boxes of which the factories has 240 pieces, 120 for men's work and 120 for women's and children's work.

## Closing department

At the end of the project the closing department was extremely well equipped but in 1978 it had faced serious problems in the employment of operators. The labour force showed little interest in working overtime hours and the department had the highest absenteeism rate in the Centre. Productivity was not up to international standards, even when working on the piece-rate payment system, although it would be incorrect to blame this on inadequate training, and often originality of design had to be simplified to keep production flowing.

Women were first trained on flat machines sewing simple lining work or sandals, and they were provided with guides to make operation easier and to improve the appearance of the finished upper. When more experienced they moved on to specialized machines such as the post machine.

Initially the Centre had one folding machine for which all work had to be pre-cemented. A new thermocementing and folding machine using granulate cements arrived in July 1978 and was used for all leather and some synthetic materials, the original machine only being used for synthetics when needed. Approximately two months training was necessary to produce fully acceptable work.

To control the machine closing room operators have to be able to stop the machine at exactly the right point for the required number of stitches. Training started with instruction on the functioning of the machine, adjustment of the chair and the correct posture while using the machine. Operators were then taught how to use the pedal while keeping the machine running slowly and evenly, and how to sew the correct number of stitches. Oiling, changing of needles and cleaning the machine were demonstrated and the mechanic adjusted the clutch to allow even friction and to control rotation.

Women were first taught to stitch straight lines on paper within a certain time limit, then more intricate designs and finally to sew lining into shoes and to stitch sandals, using guides welded to the jumping transport.

Guides were used on the perforating machine only when necessary and as it was a simple machine to operate the mistakes that occurred were caused mainly through carelessness. Perforation of sandal straps, buckles etc., was done on two pneumatic presses with templates, and production ran smoothly.

Due to frequent changes of staff a number of people operated the eyelet machine. It was simple to handle, but the correct setting for different styles needed control. In spite of samples being available to check against, occasional mistakes occurred. The main problem, however, was the inability to obtain spare punches from the manufacturer and eventually simple 5 mm punches were made at the Centre.

One of the problems that arose in the closing room was that operators did not sharpen post machine trimming knives regularly which resulted in reduced lengths of stitching and poor lining trimming. They also had to be reminded continually to adjust the tension of upper and lower thread, according to the materials being used.

## Bottom cutting department

Not until 1979, after continuous training of personnel, did this department function efficiently.

For economic reasons, soles, insoles, toepuffs and stiffners were drawn on the sheets until cutters became able to do without the drawings. Skiving of leather, synthetics and rubber required an understanding of the different degrees of skiving as well as the different machine settings. This demanded continuous training, particularly in the skiving of toe-puffs and stiffners from synthetic materials. Slotting of insoles had to be constantly checked for correct lengths so that straps fitted exactly when lasted.

The automatic sole scouring machine and the insole trimming machine were easy to operate, but as setting required more skill it needed constant control. Although problems were experienced, the situation was much improved by 1979. Setting of numbering, insole slotting and insole pressing machines was not difficult and training proved relatively short and problem free, but difficulties with rand laying did occur, these being overcome by repeated practical demonstrations. Setting of the automatic sole trimming machine was done by the mechanic so the operator only had to place the sole units between the clamping moulds before starting the machine.

Cementing of sole units, using a sole cementing machine, was an easy operation and yet it took a long time before operators were able to perfect this, to correct the viscosity of the cements and keep the machine perfectly clean. All sandal straps were cut in this department and when using synthetic upper materials two metre length straps were precemented before cutting and immediately passed on to a special machine for folding various strap widths.

After 1978 all cutting knives were produced at the Centre but as they were made of cold-bent steel and not forged, fewer soles could be cut at one time i.e. normally only one pair.

## Sandal lasting and making department

Production-wise this was the largest department in the Centre, manufacturing a variety of footwear for men, women and children. The children's footwear was made mainly to improve material utilization and therefore in small quantity.

As all sandals are hand-lasted operators have their own table, lasting stand and usually three to six pairs of lasts. Lasting techniques vary for different types of sandals, but openings at toes, heels and sides remain the same, and special templets were prepared for this purpose. Periodic problems with loose lasting were experienced in which case the operator had to relast every pair not acceptable. The supervisor often assisted in sole laying in order to control lasting, cementing of upper and sole units and to check that the cement was sufficiently dry before being used. One person was needed to prepare work for the lasters, to receive all sole units and to distribute them for roughing or solvent wiping, and to see that the transporter was always filled with lasted sandals ready for roughing, cementing and sole laying. Uppers came in boxes of 40 pairs and after the lasting margin was roughed they were repacked into the same box together with roughed insoles, for delivery to the lasters.

The department made every effort to rough all polyurethane soles but at times the need for more soles than the roughing machines could handle necessitated solvent wiping. Three people were needed for this, two for basic cleaning and one for final cleaning.

One of the difficulties experienced was that operators did not take sufficient care in differentiating between synthetic and leather roughing; synthetics needed a copper brush, leather a steel brush and scouring paper was also used.

Frequent changes of staff in this department, mainly inmates of the prison, made training a time-consuming process. Operators usually started with attaching insoles and cementing uppers and insoles. When fully familiarized with this they went on to the technique of lasting a more simple type of sandal.

## Lasting, making and finishing department

The cutting and closing departments were never able to satisfy the production demands of the lasting department, which after finishing shoe and boot uppers lasted sandals. The department is excellently equipped with machinery and a great deal of time was spent on training personnel to operate it. The supervisor was trained in production techniques, knowledge of materials and the various types and uses of cements, special emphasis being placed on activating time and press time for various types of sole units. Operators were given instructions on the daily oiling, cleaning and adjustment of machinery but in spite of this proving fairly successful, oil was sometimes used on clutches and tackspots which created tremendous problems.

When uppers arrived from the closing department toepuffs were fused on a special activating press. Then a thermoplastic stiffner was inserted and moulded first with an activating unit and then with refrigerated moulds for immediate set. Attachment of insoles and the pulling-over process was satisfactory but side and hand lasting less successful, and repeated demonstrations were given to emphasize the importance of firm lasting in the shank portion and the over ball-points to obtain a shoe with good shape retention.

Roughing and cementing of the lasting margin needed strict control, as excessive roughing resulted in almost immediate upper tearing. Operators have been known deliberately to rough incorrectly so that they could be transferred: similar incidents have occured in other departments as well. During trimming and scouring operations special emphasis was placed on the shape of the finished sole, edging and heels and special guides for scouring machines were ordered to provide maximum efficiency. At the start of the project lasts were usually slipped after machine-cleaning of the shoe but in 1979 shoes were finished on the lasts. After last slipping, socks were inserted and the shoes laced, inspected and boxed.

## Mechanical department

One of the main concerns when starting up factories in developing countries is to ascertain that adequate mechanical expertise is available in order to maintain and run machinery at maximum efficiency.

In 1977 the mechanic at the Centre had had some experience on simple machinery but little on more advanced machines and for this reason his training was given top priority. During the second phase he learned to repair sewing machines, gained a full understanding of various hydraulic and pneumatic systems, some knowledge of electronics, how to go about setting out guides for operators, and how to make spare parts and perforating tools. It was essential to know where outside assistance was available when needed and here the ship-building yard proved invaluable with the rewinding of motors and production of various machine parts.

The mechanic attended two training courses abroad but the knowledge he gained of cutting knives at a course in Austria was very basic as he only spent a short time there and he received further training in welding at the Centre. Assistant mechanics were trained throughout the duration of the project and together with the experience and aptitude of the chief mechanic it was felt that this department would run efficiently in the future.

## Future personnel and training

The following recruitment and training of personnel was envisaged in the project document to achieve a production level of up to 600 pairs of footwear in one shift:

"(a) 120 workers will be provided with further training in order to achieve the proposed production target;

"(b) 5 to 10 highly skilled workers will assume important positions in the various compartments after acquiring the necessary training;

"(c) 3 to 6 technicians to be trained to meet the requirement at the technical/managerial departments (planning, production, technical and quality control);

"(d) The total number of trainees will reach 180 by the end of June 1978. They will be capable of producing 500-600 pairs of footwear in one shift."

The Centre very nearly achieved the estimated production level in the second half of 1978 with a work force of approximately 100 labourers, only 80 of whom were present daily.

The estimated production for 1979 was an output of 120,000 pairs of footwear with a labour force of 120. The actual production figures for the

first four months was 34,296 pairs (table 5) with an average work force of 107 persons. This meant that the annual production target for 1979 could be reached if present production were maintained.

## III. PRODUCTION

### Production flow

Most raw materials, and other materials sensitive to heat and humidity, were stored in air-conditioned rooms. Upper and lining leather was sorted according to the type of footwear for which it was to be used and taken directly to the cutter who placed it on a special bar near the cutting press. Orders for shoes were made up in batches of 1,000 pairs, 10 pairs for each working ticket; the same applied to sandals but with work-tickets for 40 pairs. Shoes and boots have uppers and lining made of leather whereas sandals have partly synthetic upper materials and only some leather lining. Synthetics were cut in two or four layers at a time according to the thickness of material. After cutting, work was placed in special containers which could be stacked to allow minimum storage space. After passing through various operations such as splitting, skiving, marking, numbering etc., work was controlled for quantity and quality and any defects, for example, ill-matched leather, were returned to their respective departments to be redone.

Production was recorded and delivered to the closing room where incoming products were first checked for quantity and then divided into a section for shoes and boots and another for sandals. Work in the shoe section was divided so that each operator only had one job to finish, e.g., closing of back-seams, whereas in the sandal section each operator completed the entire closing of the upper part and attachment of buckles, and only strap perforations were done by other workers. Quality and quantity were controlled against samples always on hand after which work was delivered to the lasting and making department.

When the upper leather cutting department received orders identical copies of insoles, soles, stiffeners and toepuffs were passed to the bottom cutting department. The former two units were cut on a daily basis and the latter two cut on a monthly basis from synthetic materials. These components were transported from one department to the other on movable racks and finished products were stored in the bottom cutting department until needed in the lasting and making departments. Covered insoles, prepared in the bottom cutting department, were transferred to the closing room for binding.

The lasting and making department for sandals received uppers in boxes and bottom components on racks. Before lasting a new pattern it was compared with available samples to ensure uniformity of toe openings and backparts. After the sole had been attached, further control took place and when the sandal was found to be fully acceptable, it was delivered to the shoe room.

The lasting and making section received uppers in boxes. Insertion and moulding of toecaps and stiffeners was done immediately, regardless of when the shoes were to be lasted. Before being roughed or sent to the heat setter, shoes were checked for any visible defects, that the position of the upper on the last was correct and that lasting was tight, particularly the shank portion. The heat setting process tightened and stabilized the upper and towards the end of the project, cleaning, repair and finish were all done on the last after which it was slipped. Insertion of socking and lacing concluded operations but shoes were only packed and stored after a final check had been made for any defects.

## Production planning

The largest orders came from the Home Trade Department, and to a lesser degree, from private traders. These orders for at least 3,000 pairs per pattern may be produced in different colours and materials making production planning relatively simple.

Incoming orders were recorded in a production control book, a card made out for each order and a check made with the assistant production manager to ensure that the right patterns and materials for maximum utilization were selected. These production cards were stored in the material store-room and were handed out by the assistant production manager, together with the necessary material, to the upper and bottom cutting departments.

The supervisor of each department was responsible for recording daily production and for sending the previous day's production figures to the office by 8 a.m. so that management could register and control the output of each department. In this way any missing order could be picked up immediately and a check made on the reason for its delay.

In cases where defects were found the entire order was delayed until repairs were completed and a ticket made out by the supervisor listing details of defect, time and the department concerned.

Production figures for 1977-1979 are listed in table 5.

## Departmental ordering procedures

To provide maximum efficiency supervisors had to hand in requisitions to the storekeeper by 7 a.m. These were recorded on a cardex system and materials

issued by 9 a.m. Upper and lining materials, however, had to be requisitioned, sorted and controlled one day earlier. When special materials not stored at the Centre were needed, the storekeeper had to use one of the Centre's vehicles to collect them from one or other of his outside storerooms.

## Purchase of materials

In March 1977 agreement was reached with the National Tannery to supply the Centre with at least 12,500 $ft^2$ upper leather per month and all the lining leather required. At no stage was this figure realized in spite of reassurances in September 1977 that the quantity would actually be increased by 50%. By November of the same year every available strip of leather, including goat skins which had been in storage for many years, had been used to make sandals. The chairman of the Centre refused to allow import of upper leather until October 1977 when Hungary, India, Pakistan and the United Republic of Tanzania were approached to supply raw materials. In November 1977 the manager and project manager purchased 16,000 $ft^2$ of upper leather and 500 m of textile lining, during a visit to India, to meet requirements for the production of 3,000 pairs of boots ordered by the Presidency.

A loan of YD 15,000 from the Pepsi-Cola Factory in Aden enabled the Centre to order some materials in August 1977 but not until credit for YD 150,000 was received in October 1977 could material be purchased in bulk. Buying was handled by the manager, the production manager and the project manager and at least three offers were considered before a final decision was taken.

The Centre changed its suppliers according to the fluctuation of the currency of the country concerned. A large share of buying was done in the Federal Republic of Germany and Japan but in 1978, with the decline in value of the United States dollar against the deutsch mark and yen, alternative suppliers had to be found.

In 1977 the manager and project manager visited Europe to study machinery and materials. In 1978 they made a similar tour and bought materials, low-priced stock lots and excellent quality polyurethane soles and microcell-rubber at a net saving of more than $40,000. This proved that large savings could be made by careful study of market prices abroad.

Delays in delivery were experienced, particularly with polyurethane cement, thinner, eyelets, polyurethane soles etc., which effected production planning and output. Ships expected to sail directly to Aden were often delayed in Jedda for months and microcell-rubber ordered in France arrived one year late, putting an end to any production planning.

In 1978 all upper leather and most of the lining leather had to be imported as the National Tannery was not able to meet demands. However, in November 1978, the Tannery did produce some samples of side leather acceptable for sandal production but not for shoes and boots.

At the request of the Centre, manufacturers visited in 1977/78 regularly sent samples of raw materials which could be tested locally and ordered accordingly, but the delay in delivery often doubled production time e.g. eyelets and buckles. Any damage incurred during transportation was dealt with by the clearing officer, the insurance company and the production manager, and the final assessment made by the project manager before goods left the docks.

## Marketing

At the beginning of 1977 the Centre had a marketing and clearing department with 16,000 pairs of unsold products in storage because of poor craftmanship. In August 1977 meetings were held with the Departments of Home and Foreign Trade which resulted in the above footwear being repaired and sold, as well as the total production for 1978.

Private concerns bought goods directly from the Centre which increased profits by 15% over the revenue from the Department of Home Trade, but orders were only small and made from patterns in which the ministry had no interest.

Marketing proved successful because of a closed internal market, good design, correct selection of materials and colours, and because the end product was both attractive and reasonably priced. Another reason was because accent was placed on full utilization of materials as was the case when patterns for 2,000 pairs of foreparts were cut from wastage of 6,000 pairs of sling-back court shoes. Most patterns were copied from fashion magazines and made as stylish as possible. Before being cleared for production a check was made that the best possible utilization of leather had taken place without adversely affecting the pattern. Few items were rejected, not because the craftmanship was so good but because small defects, unacceptable to the international market, were permissable locally.

Prices of footwear were settled after taking into account the cost of materials, personnel, overheads etc. and allowing for a 15-20% profit. The price per unit of all materials was calculated on weight, a cost margin for sundry materials allowed, and all prices approved by the Ministry of Industry. However, basic rules for cost calculation were not followed during the last year which resulted in a profit of $6 on a simple pair of sandals. The project manager objected to this in the interests of the buyer whose low salary limits purchase of footwear.

Prices of products are lower than comparable international ones which may be attributed partly to the margin of profit of up to 20% between the ex-factory price and the price to the consumer. Prices of footwear produced at the Centre are listed in table 6. In October 1977 credit of YD 150,000 was obtained for materials and by April 1979 YD 82,000 of this had been repaid.

The question of opening shops to sell footwear in other governorates was discussed with the Ministry of Industry but no definite decision was reached.

## Lasts

Lasts are the moulds on which shoes are reproduced and cost between $10-15 per pair. They have a limited life span due to the dictates of fashion and may be used for only a year at the most to produce stylish shoes. It was therefore important that the production cycle from lasting to the last slip was as short as possible so that the last could be used several times a day, thereby reducing costs.

The Centre purchased sole units from the Federal Republic of Germany, France, Italy and the United Kingdom, most of these being delivered in English or French sizes. Factories usually delivered both lasts and unit soles, and to save time lasts were ordered in their original form except for two which had standardized backs. There was uncertainty at the Centre as to which standardized last should be ordered but the Frankfurt 71 type was finally chosen which could result in a saving on cutting knives, moulds and shank stocks.

## Duties of the project manager

In a country like Democratic Yemen which is on the threshold of industrialization the project manager cannot be only an adviser. It is essential that he

Table 6. Prices of footwear produced at the Centre
(Dinars)

| Pattern number | Factory price | Wholesale price | Retail price |
|---|---|---|---|
| Women's shoes | | | |
| 5 | 1.900 | 1.900 | 2.000 |
| 6 | 3.220 | 3.220 | 3.750 |
| 7 | 3.925 | 4.120 | 4.500 |
| 7A | 3.925 | 4.120 | 4.500 |
| 9 | 3.925 | 4.210 | 4.500 |
| 9A | 3.925 | 4.210 | 4.500 |
| 10 | 4.210 | 4.420 | 4.900 |
| 11 | 4.210 | 4.420 | 4.900 |
| 12 | 3.925 | 4.120 | 4.500 |
| 13 | 4.210 | 4.420 | 4.900 |
| 14 | 3.925 | 4.120 | 4.500 |
| 15 | 4.210 | 4.420 | 4.900 |
| 16 | 3.925 | 4.120 | 4.500 |
| 17 | 4.210 | 4.420 | 4.900 |
| Men's boots | 3.790 | 4.150 | 4.500 |
| Men's shoes | | | |
| 307 | 5.510 | 5.735 | 6.400 |
| 308 | 4.600 | 4.325 | 5.300 |
| 309 | 4.600 | 4.325 | 5.300 |
| 310 | 4.600 | 4.325 | 5.300 |
| Sandals | | | |
| 201 | 1.940 | 1.940 | 2.250 |
| 202 | 1.940 | 1.940 | 2.250 |
| 203 | 1.940 | 1.940 | 2.250 |
| 204 | 1.940 | 1.940 | 2.250 |
| 205 | 2.100 | 2.100 | 2.450 |
| 206 | 2.130 | 2.130 | 2.550 |
| 207 | 4.175 | 4.385 | 4.300 |
| 208 | 4.175 | 4.385 | 4.300 |
| 209 | 4.175 | 4.385 | 4.300 |

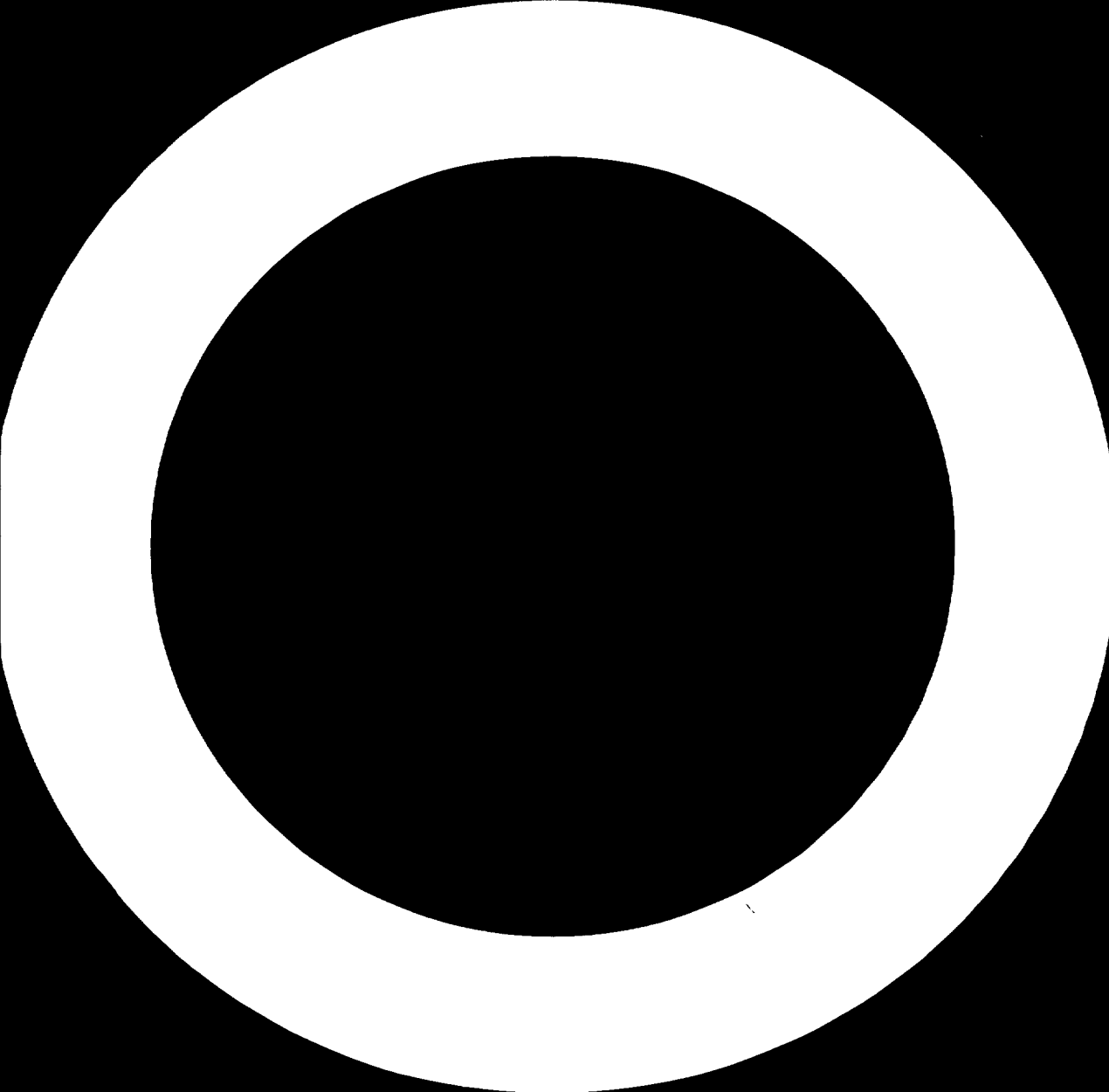
Table 6 (continued)

| Pattern number | Factory price | Wholesale price | Retail price |
|---|---|---|---|
| 210 | 4.175 | 4.385 | 4.800 |
| 211 | 4.175 | 4.385 | 4.800 |
| 212 | 4.175 | 4.385 | 4.800 |
| 213 | 4.175 | 4.385 | 4.800 |
| 214 | 4.175 | 4.385 | 4.800 |
| Children's sandals | 1.470 | a/ | a/ |

a/ No fixed price yet.

has a good practical knowledge of all machinery to set an example to workers, and also supervise the training of personnel so that they realize that quantity is no substitute for quality, for this will determine the final results.

In changing the Centre from a training and partly productive unit into a fully productive factory the project manager was responsible for the installation, running-in, maintenance and repair of new machinery, the training of operators and the making of patterns, cutting knives, spare parts and various guides for operators. In addition, he had to test new materials and accessories and advise which materials should be ordered after tenders were received. This naturally resulted in many hours overtime together with the general manager, sometimes the production manager and his assistant, and often the mechanic.



Annex I

MEMBERS OF PROJECT TEAM

| Post | Post description | Name | Arrived | Departed |
|---|---|---|---|---|
| | | International staff | | |
| 11-01 | Project manager | Odd Birkhaug | February 1977 | May 1979 |
| 11-02 | Technical footwear expert | Ken Longman | February 1978 | February 1979 |
| | | Counterpart staff | | |
| | General manager | Fadhle Hasson Yehia | August 1977 | |
| | Assistant manager | A.R. Mohyddin | August 1977 | |
| | Production manager | Saeed Mansoor | July 1974 | |
| | Assistant production manager | I.M. Abdulkarim | October 1977 | |

Annex II

MACHINERY IMPORTED, 1977-1979

| Quantity | Supplier and item | Value in foreign exchange (cost plus freight) | Equivalent value in dinars |
|---|---|---|---|
| | Carl Siek - Federal Republic of Germany | | |
| 2 | Upper leather swing arm machines, complete | DM 10 000 | 1 460.000 |
| | Vilh Pederson - Denmark | | |
| 1 | Strap turning machine, model 145 OB | DM 760 | 118.560 |
| | The British United Shoe Company - United Kingdom | | |
| 2 | Hydraulic cutting machines, with spares | £4 486 | 2 680.015 |
| 1 | Number 4 pulling and lasting machine, with spares | £14 543 | 9 336.610 |
| 1 | Automatic humid HVA machine, with spares | £3 961 | 2 542.965 |
| 1 | Number 4 surface scouring machine, with spares | £4 593.69 | 3 086.495 |
| | Freight charges | £1 280 | 822.205 |
| 1 | Number 5A lining marking machine, with spares | £1 551 | 1 059.335 |
| 1 | Monopress model A machine, with spares | £1 515 | 1 034.745 |
| 1 | Cement supply unit, with spares | £1 046 | 714.420 |
| 1 | Duo-rail transporter series 11, with spares | £15 755 | 10 760.665 |
| 1 | Number 2 marginal cementing machine, with spares | £1 062 | 725.345 |
| 1 | Heel seat lasting machine, with spares | £11 821.92 | 8 074.370 |
| 1 | Number 3 sole stamping machine, with spares | £1 360 | 928.880 |
| | Freight charges | £1 554.36 | 1 061.630 |

| Quantity | Supplier and item | Value in foreign exchange (cost plus freight) | Equivalent value in dinars |
|---|---|---|---|
| | Sagitta Officina Meccanica - Italy | | |
| 1 | Thermocementing and folding machine, PR 67/T | $2 940 | 1 029.000 |
| 1 | Special attachment to fold flat in sole | $85 | 29.750 |
| 100 kg | Thermocement | $220 | 77.000 |
| | Sewco Engineering Company - United Kingdom | | |
| 1 | Number 3 needle Puritan sewing machine, reconditioned | £1 825 | 1 204.675 |
| | S.A. Anver - France a/ | | |
| 1 | Type 408 TSM number 6835 thermic reactivating unit for thermoplastic counters | F 34 190 | 6 928.000 |
| 1 | Type 409G number 6352 thermoplastic counter premoulding unit | | |
| | Bruggi - Italy a/ | | |
| 1 | Automatic Sole Trimming | $12 475 | 4 366.250 |
| | Fortuna-Werk Maschinenfabrik - Federal Republic of Germany | | |
| 1 | Model 34-Ag standard skiving machine | DM 7 790 | 1 137.000 |
| | Tuttoscarpa SPA - Italy | | |
| 1 | Hydraulic cutting machine G/222 | L 2 450 | 1 011.850 |
| 1 | Extra block | L 26 | 10.740 |
| 1 | Hydraulic pressing machine type S/mod 756 | L 4 150 | 1 713.950 |

a/ Machines bought by UNIDO 1977-1978.

| Quantity | Supplier and item | Value in foreign exchange (cost plus freight) | Equivalent value in dinars |
|---|---|---|---|
| | Freight charges | L 710 | 293.230 |
| | F. Moller Söhne - Federal Republic of Germany | | |
| 1 | Sole scouring machine number 18B, with spares | DM 8 390 | 1 468.250 |
| 1 | Insole waist machine number BFC8, with spares | DM 9 653 | 1 689.275 |
| | Albeko Schuh-Maschinen - Federal Republic of Germany | | |
| 1 | Welt lasting machine, number 575-58 | DM 6 140 | 1 031.520 |
| 1 | Individual dust collector 792A/60 | DM 5 150 | 865.200 |
| 1 | Auto upper lacing machine | DM 8 420 | 1 414.900 |
| 1 | General overhaul machine for heavy boots | DM 8 050 | 1 352.400 |
| 1 | Seam reducing machine, with spares | DM 1 571 | 1 038.435 |
| 60 | Castors | DM 150 | 99.150 |
| | Freight charges | DM 155 | 102.455 |
| 2 | XN Rotary sole racks | DM 509 | 204.250 |
| 1 | Number 11 lasting machine | DM 959 | 633.900 |
| 1 | Number 3 needle Puritan sewing machine | DM 2 515 | 1 662.415 |
| 1 | Master clock | DM 2 447 50 | 1 617.800 |
| 3 | Time recorders | | |
| 12 | Card racks | | |
| 50 | Ink ribbons | | |
| 25 000 | Time cards | | |

| Quantity | Supplier and item | Value in foreign exchange (cost plus freight) | Equivalent value in dinars |
|---|---|---|---|
| | Kaesar Kompresson GmbH - Federal Republic of Germany | | |
| 1 | Compressor unit, complete | DM 6 356 | 967.000 |
| | J.F. Behrens - Federal Republic of Germany | | |
| 1 | Twin unit clinching machine | DM 1 665 | 278.055 |
| 1 | Service unit for machine | DM 245 | 40.915 |
| | staples | DM 572 | 95.525 |
| | J. Sandt AG - Federal Republic of Germany | | |
| 2 | Trade mark embossing stamps, 50 mm | DM 682 | 117.305 |
| 1 | Production drawing | DM 207 | 35.605 |
| 2 | Trade embossing stamps, 40 mm | DM 576 | 99.075 |
| 2 | Tools for P.U., 9 teeth | DM 190 | 32.680 |
| 1 | Heel scouring machine number 078 | DM 4 806 | 826.635 |
| | Freight charges | DM 359 | 61.750 |
| 1 | 143 Individual dust collector | DM 2 868 | 493.295 |
| | Spares for machine | DM 375 | 65.500 |
| 1 | 410 Hydraulic swing arm cutting press | DM 10 395 | 1 787.940 |
| 1 | 339 Multifeeder | DM 10 368 | 1 783.300 |
| 1 | 9132 Insole slotting machine | DM 4 912 | 488.865 |
| 2 | 143 Individual dust collectors | DM 5 736 | 986.595 |
| 1 | D. Cold polishing machine | DM 6 570 | 1 130.040 |
| 6 | Cloth brushes | DM 546 | 939.120 |

| Quantity | Supplier and item | Value in foreign exchange (cost plus freight) | Equivalent value in dinars |
|---|---|---|---|
| 2 | 078 Heel scourers | DM 9 612 | 1 652.920 |
| 150 | Rolls sand paper | DM 12 500 | 2 150.000 |
| 1 | 413 Side cement lasting machine | DM 6 072 | 1 055.565 |
| 1 | 9103 Pora-HS2 for heavy boots | DM 6 137 | 1 055.565 |
| | Spares | DM 693 | 119.200 |
| | Fritz Wagner WSK - Federal Republic of Germany | | |
| 1 | Pneumatic eyelet machine medium 804 | DM 1 395 | 231.570 |
| 1 | Pneumatic press 805 | DM 2 100 | 348.600 |
| 1 | Pneumatic press 807 | DM 2 620 | 434.920 |
| 100 | Punches | DM 150 | 24.900 |
| | Pfaff - Federal Republic of Germany | | |
| 1 | CL 438/49-01 Sewing machine, with spares | DM 3 970 | 674.900 |
| 1 | CL 544/944001 Sewing machine, with spares | DM 3 730 | 634.100 |
| 1 | CL 38/45-12-915/01 Sewing machine, with spares | DM 3 594 | 610.980 |
| | Freight charges | DM 506.15 | 86.045 |
| 1 | CL 194/61-09 Sewing machine, with spares | DM 4 466 | 750.450 |
| 2 | CL 463-944/01 CL Sewing machines, with spares | DM 4 456.10 | 748.625 |
| 1 | CL 463/944-01 CL Sewing machine, with spares | DM 1 503.40 | 252.570 |
| 1 | CL 471-755/01 BLX 1.2 Sewing machine, with spares | DM 6 094.50 | 1 023.875 |
| 2 | CL 491-755/03 Sewing machine, with spares | DM 12 189 | 2 047.755 |

| Quantity | Supplier and item | Value in foreign exchange (cost plus freight) | Equivalent value in dinars |
|---|---|---|---|
| 1 | Hestika sole cementing machine number 1016LVR | $2 800 | 980.000 |
| 1 | 410 Electricity-hydraulic swing arm cutting press | DM 13 274 | 2 100.000 |
| 1 | Eyelet machine | $7 130 | |
| 1 | Foil embossing machine | $20 691 | |
| 1 | Upper roughing machine | | |

## Annex III

## TRAINING COURSES

Continuous training of personnel took place from the start of the project as can be seen from the data below, but the total number of staff who completed training in 1978 is not an accurate figure as many were retrained. In 1979 only individual training on new machines took place.

| Course | Dates | | Duration (months) | Number of trainees | |
|---|---|---|---|---|---|
| | Beginning | End | | Starting | Finishing |
| Upper leather cutting | Feb. 1977 | May 1977 | 3 | 3 | 3 |
| Upper leather cutting | Apr. 1978 | Sept. 1978 | 7 | 3 | 2 |
| Closing and prefitting | Aug. 1977 | Sept. 1977 | 2 | 28 | 28 |
| Closing and prefitting | Aug. 1978 | Dec. 1978 | 4 | 3 | 6 |
| Lasting, making and finishing | Mar. 1977 | Apr. 1977 | 2 | 18 | 18 |
| Lasting, making and finishing | Dec. 1977 | June 1978 | 7 | 22 | 22 |
| Bottom cutting | July 1977 | Sept. 1977 | 2 | 5 | 4 |
| Bottom cutting | Jan. 1978 | May 1978 | 5 | 6 | 3 |
| Calculation of material consumption | Aug. 1977 | Aug. 1977 | 2 | 3 | 3 |