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Price Waterhouse

AWASSA TEXTILE FACTORY. ETHIOPIA

DESIGN OF INTEGRATED PROCESS COSTING SYSTEM

FINAL REPORT - VOLUME ONE

MAY 1994

Price Waterhouse

16 May 1994

United Nations Industrial Development Organisation
Contract Section
P O Box 300
A-1400
Vienna, Austria

Attention: Mr D Gardellin

Dear Mr Gardellin

UNIDO PROJECT: DP/ETH/89/017 CONTRACT 93/157/VK

We are pleased to present 10 copies of our final report of a Process Cost Accounting System for the Awassa Textile Factory (ATF) under the above referenced contract. The main difference between our final report and the draft final report which you have approved is the inclusion of Appendices III and IV in Volume Two.

Appendix III incorporates amendments to the costing system which now caters for additional products introduced by the management of ATF since our last visit in February 1994.

Appendix IV sets out the completed cost sheets for the quarter ended 31 March 1994 which were prepared with the personnel of ATF during our recent visit between 25 April and 6 May 1994. In addition, a summary showing the transfer of goods between cost centres and the various stores demonstrates that the costing system can work. However, due to poor recording of waste, the need to estimate some production figures as recording did not commence at the start of the quarter and differences between the physical and book inventory quantities, the cost figures are not very useful and realistic for this first quarter. This is almost inevitable when a new costing system is introduced but the quality of the cost figures generated from the system should improve as the company gains more experience in the information gathering process.

We intend to carry out a final visit to Awassa to prepare a post completion report when it is mutually convenient to all parties. We will inform you accordingly once the timing of our visit is confirmed.

Please find enclosed our fee notes regarding the receipt and acceptance of both the Draft Final and Final Reports in accordance with sub-paragraphs 2.10 b) and 2.10 c) of the above mentioned contract.

Should you require additional information, please do not hesitate to contact us

Yours faithfully

DESIGN OF INTEGRATED PROCESS COSTING SYSTEM
VOLUME ONE

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LIST OF ABBREVIATIONS USED IN THE REPORT

AA	Addis Ababa
ATF	Awassa Textile Factory
CBE	Central Bank of Ethiopia
COS	Chief of Stores
GRN	Goods Received Note
GoE	Government of Ethiopia
lm	Linear Metre
MoI	Ministry of Industry
MRN	Material Requisition Note
WIP	Work-in-Process
Ne	Unit of Measure of Fineness of Yarn
NTC	National Textiles Corporation
QC	Quality Control
SIV	Stock Issue Voucher

EXECUTIVE SUMMARY

The report is not intended to be a text book on cost accounting. Therefore explanations of cost and financial accounting theory will be limited to those necessary for an understanding of our proposals and will assume a basic understanding of certain accounting principles.

In later sections we give comprehensive arguments for the introduction of cost accounting systems and will not repeat them here. However, to understand this executive summary it is necessary to define briefly the purpose of a cost accounting system. Our simple definition is that a cost accounting system gives the ability to establish the differing costs of different products made in the same establishment. On the other hand, a financial accounting system will establish the total cost of all output for that establishment. If the establishment concerned makes only one product, then the simple division of total cost by total output will give the unit cost of the output for the period in question. Further analysis is necessary to establish differential costs where different products are made; this analysis is normally performed by the implementation of a cost accounting system.

The three elements of cost are materials, labour and overheads. Wastage apart, the costs of materials per unit of output are fairly easily estimated and costed. Exceptions to this statement are those items called indirect materials, an example being cleaning materials. These are best classified as overheads and treated accordingly. Labour and overhead costs are more difficult since the same inputs, such as a factory worker, a machine or an area of the factory, might be involved in the manufacture of many if not all of ATF's different products during the course of the cost accounting period in question. Their associated costs need to be equitably charged to all of the products made during the period in a sensible manner related to either the volume of inputs consumed or outputs produced.

In an absorption cost system, all of the costs in the period of all relevant inputs are charged to the production of that period. The major function of our proposed system is the specification of the manner in which these input costs are charged to the various finished products.

To effect this charging of labour and overhead costs we use a two stage approach

- first, all costs are either directly charged or allocated to a "cost centre". A cost centre (for the purposes of this report) is defined as a part of the whole factory in which similar (or closely related) operations are carried out, which has a separately identified work force and is (probably) separately supervised;

- second, the accumulated costs for each cost centre for the period are charged or apportioned to each unit produced in that cost centre during the period.

In identifying the basis of the charging process, a trade-off will inevitably have to be made between absolute accuracy and costs of operating the system. In arriving at our proposed method we have, we believe, achieved a sensible balance which will not be unduly burdensome but which will produce results of acceptable accuracy.

In the body of the report we discuss absorption and standard costing systems. It must be stressed that neither of these systems have any effect on the actual costs incurred by ATF - they are simply two different methods of reporting historic costs and predicting future costs.

In this report, we recommend that ATF implement a manual, absorption costing system.

Absorption costing is a traditional form of product cost ascertainment. It is based on the principle that costs should be charged to (or "absorbed into") whatever is being produced on the basis of the benefit from those costs.

If an overhead cannot be allocated directly to a cost centre then it must be apportioned to a cost centre. This involves finding some basis that will enable the overhead to be equitably shared between cost centres.

The system which we have devised uses 8 cost centres. All direct material and labour costs are allocated to these cost centres whilst appropriate indirect costs are apportioned to cost centres on the most appropriate basis.

Full unit costs of production will be produced quarterly using the financial accounts which are also prepared to this same timetable.

The major quarterly outputs from the system will be two-fold :

- first, a cost report for each cost centre showing the cost either per kg or per linear metre of each output from that cost centre;

- second, a product cost summary for each major product which ATF sells and which was produced during that period. This will summarise material, labour and overhead costs per unit of output in each cost centre in which that product is processed.

We have chosen a manual absorption costing system because it can be implemented at ATF much more quickly than a manual standard costing system. To install a standard costing system at ATF requires that standards be set first. Any thought of installing a computerised system is premature.

Setting of standards for materials, labour and overheads requires a detailed study of the operations which are involved in the manufacture of each product.

Issues to be considered before implementing a standard costing system are :

- ATF management should be prepared to invest a considerable amount of time and money in establishing standards, possibly involving the appointment of outside consultants;
- a qualified cost accountant should be recruited;
- there should be a strong budgeting system.

Following the production, submission and approval of the draft of our final report it was discovered that ATF had added additional products to its range. This discovery was made at the time of our visit to prove that the costing system would work. As a result of the discovery we amended the cost sheets and methods of apportionment to cater for new products since our proposed costing system was designed to cater for this situation. The illustrations which had been used during the course of preparation of the draft of the final report had been used as typical of ATF's product range at that time. We have therefore not amended the main body of the report but have added an Appendix to Volume Two, in which we have explained how we amended the procedures and the cost sheets to include this additional product. By so doing we have proved that the system is capable of being adapted. However, we were only able to make this change at such short notice because we were using a spreadsheet package to generate the cost sheets. This serves to underline our recommendation that ATF should use a spreadsheet package in the same way. Facilities already exist at ATF to do this.

The report is structured as follows :

Section 1 - Introduction

This section covers the background to this report and our terms of reference.

Section 2 - Review of Current Situation

This section is a review of the current situation at ATF considering financial highlights, current processes and financial and cost accounting systems.

Section 3 - Proposed System

This section describes the proposed absorption costing system. It includes a comparison of absorption vs. standard costing, the reasons why we recommend absorption costing, a description of the proposed system, timing considerations and our recommendation for the organisation of the finance department.

In order to guarantee the successful implementation of the system, it should start at the beginning of a new financial period. Currently financial statements are prepared on a quarterly basis and as a result we recommended the implementation of the system during the quarter which commenced on 1 January 1994. Should ATF decide in the future to prepare financial statements on a monthly basis the same activities which should be carried out quarterly should then be performed monthly. These activities are as follows :

1) Virtual acceptance of the system as recommended or with agreed minor revisions;

2) A stock count and valuation of all stock on hand at ATF at the end each financial period. This must be reconciled to the stock value per the general ledger and all relevant financial adjustments made.

3) Review of all the physical factors we have used for apportionments of costs between products so that the manual can be amended (if necessary) to take into account any price changes, modifications in the components used to produce the products, variation in the range of goods produces, etc.

Section 4 - Procedure Manual

This section consists of a detailed, step by step manual of how to use the system. It includes costing forms to be used, examples, notes on how to complete the forms and lists of activities to be completed by ATF employees. For ease of distribution to all users it has been produced as a separate volume.

Section 5 - Training Requirements

This section outlines the training required to implement and operate the system. Training is split between internal training to be carried out by us and external training covering cost accounting and computerisation.

Section 6 - Computerisation

This section deals with computerisation of the financial systems in general, and costing systems in particular. We do not advocate computerisation of our proposed absorption costing system.

Section 7 - Transition to a Standard Costing System

This section discusses the enhancement of the recommended absorption costing system to a standard costing system. A key prerequisite to this enhancement is the collection of the necessary data to allow standards to be set. The information developed in the quarterly absorption costing system will provide valuable input to setting standards. However, we recommend that production of "absorption costs" on a monthly basis should be fully accomplished before any move to standard costing occurs.

1 **INTRODUCTION**

In early 1991, a team of consultants from Price Waterhouse visited the Awassa Textile Factory (ATF), the National Textile Corporation (NTC) and the Ethiopian Ministry of Industry (MoI) to collect background data for the submission of a proposal for the development of an integrated process costing system in ATF.

Our proposal was submitted in July 1991. (A copy is attached as Appendix VII to this report). For a number of reasons, the award of the contract was delayed until July 1993.

During the period between the submission of the proposal and the award of the contract the specification of the project was amended.

In essence the amendments consisted of the following :

- reemphasis of the fact that, in our proposal, we had stated that the design of a standard costing system would not be possible with the current state of development of ATF's finance department;
- emphasis of the fact that Price Waterhouse were not to be responsible for implementation of the system to be proposed; our responsibilities to be limited to testing the system;
- elimination from the original proposal of references to the design of a computerised cost accounting system.

Work on the project commenced on Tuesday 12th October 1993.

The final report has been written taking into account our findings during the following visits to ATF :

Dates of Visit	Purpose of Visit
12 October to 19 November 1993	Preliminary design of the system and issue of interim report
16 to 28 January 1994	Discussion of interim report, presentation of the costing system and review of the procedures to collect the necessary information for the quarter beginning 1 January 1994
13 to 18 February 1994	Follow-up visit to ensure adequate implementation of the system and procedures and further discussions of the final draft copy of the report
25 April to 6 May 1994	Testing the system, producing the cost figures for the quarter ended 31 March 1994 and final review of the system's key physical factors and assumptions.

In addition, a visit to the United Nations Development Organisation in Vienna was carried out between 4 and 6 January 1994 to discuss our interim report.

As indicated elsewhere in this report we have attempted to make our system simple to follow and implement without undue loss of accuracy. This is because of the lack of cost accounting skills in ATF. When a Costing and Budgeting Head of Department is appointed and fully trained he will be able to take many of our assumptions and amend them to produce more accurate product costs.

For example in our cost sheets we have assumed that all stock and WIP in a cost centre has the same unit value. This is clearly not totally correct since its value will depend on how far through the process it has progressed at the time it is counted and valued. A further assumption is that all closing WIP has the same value as the finished output of the department concerned. The degree of inaccuracy will depend on the exact mix of stock at the various stages at the time of the stock count. However, taking one period with another, the level of inaccuracy is not important because closing stock levels from one period are carried forward to the subsequent period as opening stock thus giving a corresponding (but opposite) gain or loss in the next accounting period. However, unit costs derived from the figures will be slightly incorrect in the two periods concerned.

A trained cost accountant would be very capable of amending our system to cater for such improvements.

2 REVIEW OF CURRENT SITUATION

2.1 FINANCIAL HIGHLIGHTS

We reviewed the financial reports of ATF for the year ended 30 June 1993 and for the subsequent quarter ended 30 September 1993. Our review had two main objectives :

1) to gain an understanding of the financial condition of ATF;

2) to ensure understanding of all assets, liabilities, revenues and expenses which would have an impact on the design of an integrated costing system.

Our review consisted of examining the provisional financial statements and the notes to accounts of ATF (See Appendix I) for the year ended 30 June 1993 and the quarter ended 30 September 1993. We asked ATF staff for explanations where necessary. We did not perform an audit and we do not express any opinion as to the accuracy or fairness of these financial statements.

The financial highlights of ATF for the two periods may be summarised as follows:

Balance sheet

(Birr m)		June 1992	June 1993	Sept 1993
Assets:	Fixed assets(net)	115	106	104
	Deferred expenses	4	3	3
	Stock	23	56	82
	Debtors	8	12	9
	Associated enterprises(net)	13	9	7
	Cash and bank balances	12	2	1
		175	188	206
Liabilities:				
	Bank overdraft	1	4	4
	Creditors	20	35	55
	Medium term loan (CBE)	8	8	8
	Long term loan (Italy)	110	108	108
		139	155	175
Equity:				
	State capital	40	34	34
	General reserve	(4)	(1)	(3)
		175	188	206

Profit and Loss Account

(Birr m)	June 1992	June 1993	Sept 1993
Sales	35	30	5
Costs of goods sold	28	26	5
Gross operating surplus	7	4	0
Other income	3	2	0
	10	6	0
Less expenses	10	9	2
Net profit/(loss)	0	(3)	(2)

We made the following observations from our review :

1) No statement of changes in financial position has been prepared. There has been a decrease in cash of 13 million Birr in the year ended 30 June 1993 represented by a decrease in cash and bank balances of 10 million and an increase in bank overdraft of 3 million.

2) Sales decreased by 5 million during fiscal 1992-1993 and by another 2.5 million in the first quarter of fiscal 1993-1994 It is unknown if the sales decrease is due to a slowdown in economic activity in Ethiopia, or uncompetitive pricing by ATF, or some other cause.

3) Stock increased by 33 million in fiscal 1992-1993 and by a further 26 million in the first quarter of fiscal 1993-1994. The latter increase represents a one year supply of cotton received by way of a US grant to GoE. Management has continued to produce even in the light of the sales slowdown. The decision is apparently driven by a desire to maximise factory utilisation and employment rather than profitability.

4) Interest in excess of 5 million was expensed but unpaid in fiscal 1992-1993 re loans and bank overdraft. A further 1 million has been expended so far in fiscal 1993-1994. Accrued interest is now in excess of 16 million.

5) ATF was previously under the umbrella of NTC, but now operates independently. ATF continues to trade with other companies (Associated enterprises) previously controlled by NTC.

2.2 DESCRIPTION OF PROCESSES AND PRODUCTS

2.2.1 Diagnostic Survey

A general diagnostic survey was performed during the period between 25 and 28 October 1993. The following is a summary of the operations of the factory.

ATF is an integrated textile operation, taking raw cotton and converting it into finished woven fabric. The factory currently operates a three shift operation, six days per week (closed on Sunday), employing approximately 1,350 employees. Current employment per department is as follows :

1	Spinning	412
2	Weaving	218
3	Finishing	294
4	Technical Service	179
5	Administration	176
6	Commerce	37
7	Planning & Programme Service	36
	Total	1,352.

The factory produces the following fabrics :

1 Twill
2 Poplin
3 Cretonne
4 Cheesecloth
5 Gauze
6 Sheeting.

The weaving machines currently employed are designed to produce a wide range of other woven fabrics.

ATF is a production driven organisation, its aim apparently being to run equipment to full capacity thus creating employment. The organisation has been in transition in recent years as GoE funding has been withdrawn. Budgets prepared during recent years indicate attempts to come to terms with a market driven environment. However, there is much progress yet to be made as can be seen from the increased stock holding.

ATF is currently operating below its theoretical maximum capacity. The exact level is hard to ascertain due to a lack of standard data, but is estimated to be in the 50% to 60% range.

Conflicting data on capacity levels was received from different sources. The following is a listing by department of current daily production levels, current goals, and theoretical maximums assuming the same historical product mix at 85% efficiency.

	Actual	Goals	Theoretical
Spinning	5.000 kg	5.280 kg	7.000 kg
Weaving	18.000 lm	25.264 lm	35.000 lm
Finishing	35.000 lm	55.000 lm	68.000 lm

The current finished width of all fabrics is 1.5 metres.

These figures are intended only to give a sense of proportion and a general feel for the operations of the factory. The actual theoretical production figures will vary due to the type of product being produced. These figures were provided by the operational managers in each department, and varied from those mentioned by the production planning manager and the budgets.

Capacity levels for finishing are significantly higher than for weaving. This is a feature of the original design of the factory. Additional grey goods (undyed and unfinished fabric) are purchased from outside sources to augment ATF's own weaving capacity and thus increase output of finished fabrics.

For conceptual purposes, it is best to think of ATF as three independent factories : spinning, weaving, and finishing.

In addition to the description of these "factories" set out below we have included an operational flow chart showing the existing cost centres and processes, together with our proposed cost centres. This appears as Appendix II.

2.2.2 Spinning

The spinning department takes raw cotton and converts it into finished yarn to be used in weaving. Cotton is issued from the raw cotton inventory and taken to the first operation in spinning. The sequence of operations is as follows :

Blowing
Carding
1st Passage drawing
2nd Passage drawing
Roving
Ring Spinning
Winding
Doubling
Two for one twisting.

2.2.3 Weaving

The weaving department takes finished yarn and converts it into grey fabric. The sequence of operations in weaving is as follows :

Direct Warping
Sizing
Weaving
Brushing
Inspection.

2.2.4 Finishing

The finishing department transforms grey cloth into finished fabric. Fabric may be either dyed in solid colours or dyed and printed. The sequence of operations in finishing printed and/or dyed cloth is as follows :

Dyed material

Singeing and Desizing
Scouring and Bleaching
Drying
Mercerizing
Dyeing
Intermediate inspection
Finishing
Sanforizing
Final inspection:

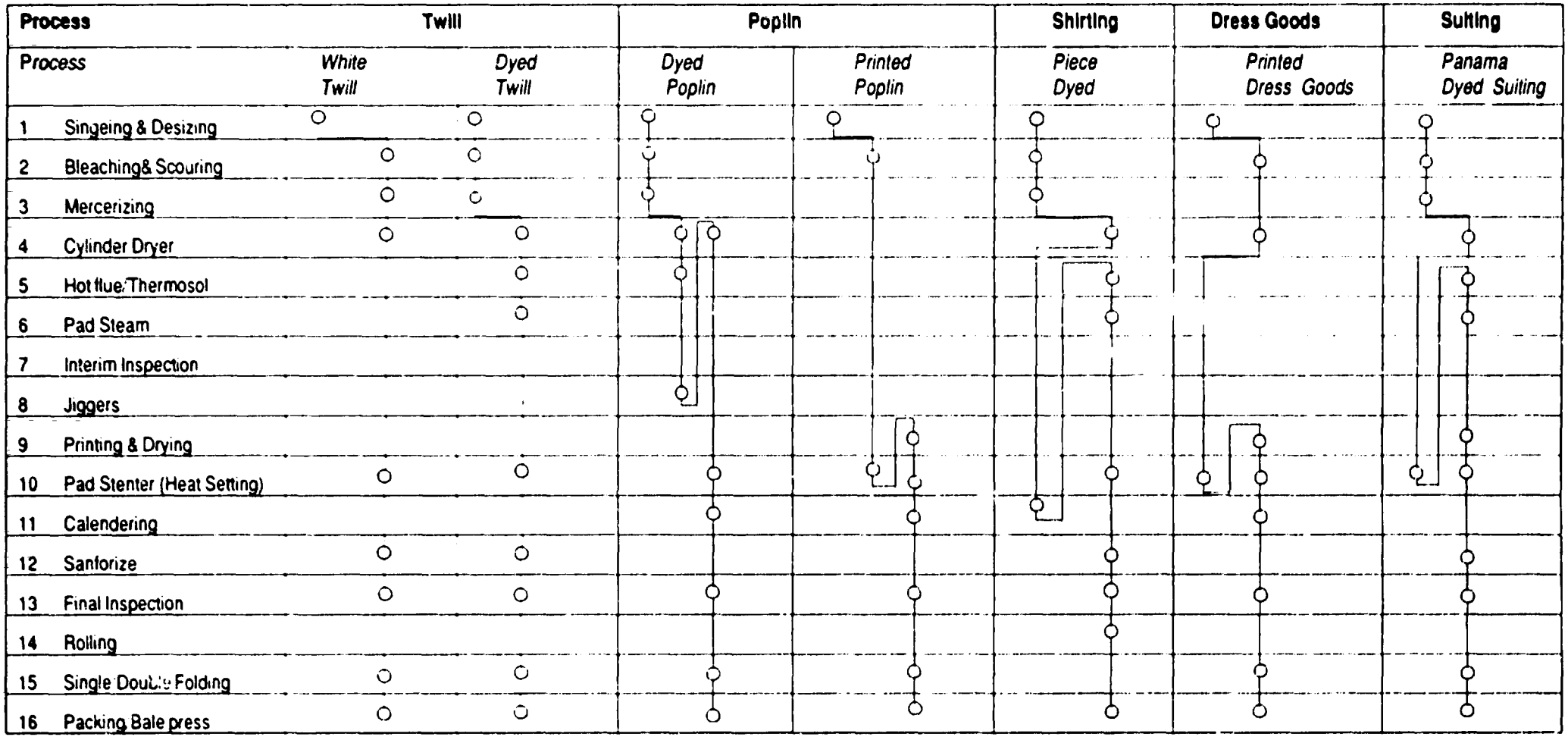
Printed material

Singeing and Desizing
Scouring and Bleaching
Drying
Stentering
Printing
Intermediate inspection
Finishing
Final inspection.

It must be noted that many other possible sequences exist. The two outlined above are typical. See the chart on the next page for some idea of the complexity of the routing.

Fabric can be shipped in either roll or bolt form. Apparel manufacturers require rolled fabric while small fabric shops prefer standard 50 metre bolts. Bolt assortments are compressed into bale form prior to being put into the finished goods store. After final inspection there is an assortment assembly and packing department which prepares goods for the finished goods inventory.

AWASSA PRODUCT — Various Paths Through the Finishing Department



2.2.5 Quality Control (QC)

There is an extensive QC process throughout the factory. Intermediate quality checks are performed and numerous quality reports prepared. There is a physical product laboratory and a chemical laboratory both with up to date testing machines. The laboratories perform standard tests on a statistical basis on yarn, grey goods and dyed fabric.

Fabric Inspection

Final fabric inspection is performed on a 100% basis in the weaving and finishing departments. This is under the direct control of the QC department. Intermediate inspection is also carried out in these departments. Statistical inspection of finished yarn is also carried out. Modern inspection frames are used for the fabric inspection process.

The quality standard is based on defects per 100 metres.

Grade A - 10 or less defects
Grade B - Between 11 and 20 defects - Seconds
Grade C - 21 or more defects - rejects

It should be noted that many defects which are apparent in the grey goods state can be "covered over" in dyeing. For this reason fabric inspection on the same fabric after dyeing will reveal fewer defects than in the grey state.

No point system is used in classifying defects as is standard in most textile factories: all defects count the same. This procedure should be re-evaluated, as different defects cause substantially different degrees of difficulty to the primary end users of the product, apparel manufacturers.

The overall quality programme seemed good, but improvements can be made. For instance, no effort is made to track defects against individual weaving machines at the grey inspection process. This should definitely be done. A Pareto type relationship exists between weaving machines and defects. Approximately 20% of the machines will tend to produce 70% to 80% of the defects. Instigating this procedure will help identify problem weaving machines and help reduce weaving defects. The overall quality level of the finished product seemed good.

2.2.6 Stores Areas/Warehousing

Security in the stores areas is good. All areas are kept locked and security procedures are adequate.

2.2.7 Physical Weighing of Inputs

There are four floor scales in the factory, plus several mobile scales. A rough physical check revealed that all floor scales showed a consistent weight. Physical weight checks are carried out as follows :

Floor scale #1 - Raw cotton storage area

100% of raw cotton bales are weighed. This weighing is done prior to dispatch to the blowing room.

Floor scale 2 - Spinning area

All yarn cones from winding are weighed on these scales.

Floor scale #3 - Yarn storage area

All yarn dispatched to weaving is weighed.

Floor scale #4 - Warping

All warp beams are weighed prior to dispatch to weaving.

2.3 CURRENT FINANCIAL ACCOUNTING, COST ACCOUNTING AND CONTROLS

2.3.1 The Financial Organisation

The financial function at the factory is the responsibility of the Finance Manager and is divided into two departments - finance and commercial. These are described below.

i) Finance Department

The finance department is headed by a Finance Manager. This senior position was recently filled in January 1994. He is responsible for the financial accounting, payroll and the costing and budgeting sections.

Financial Accounting

The section is currently headed by a senior accountant who is supported by 2 accountants, 3 junior accountants and 3 clerks.

This section is responsible for :

- recording financial transactions;
- administering cash resources;
- providing financial advice;
- preparing quarterly and annual financial statements.

Weaknesses Identified and Recommendations

1 Since the position of Finance Manager has been vacant in the past and due to the absence of experienced accountants, work in the section is not adequately reviewed.

We recommend that all key financial positions per the organisation chart be filled by qualified staff as soon as possible.

2 Budgeting is the responsibility of the planning department. The general ledger system does not track expenditure against budget; consequently, no performance reports are produced. An informal review of actual results against budget is conducted jointly by finance and planning. Control of expenditure is nevertheless difficult.

We recommend actual results be compared against budget on a regular, formalised basis.

Payroll

This section is nominally headed by a payroll master and 3 clerks. Currently, the section has a senior accountant who is supported by 3 clerks. Additionally, there are 2 payroll checkers who report directly to the Finance Manager. Their responsibility is to check that the payroll is accurate and that all deductions and attendance sheets are reconciled. This check is conducted after the payroll has been paid.

This section is responsible for :

- preparing bi-monthly and monthly payroll;
- preparing reports for the Finance Manager.

Weaknesses Identified and Recommendations

1 The payroll department lacks segregation of duties. Often, the payroll master assists the clerks to input the attendance sheets into the payroll programme. There is thus no independent review of the inputs.

We recommend that adequate clerical staff be hired to carry out all payroll system inputs and hence allow the payroll master to perform his review duties.

2 The payroll checkers are not properly placed. They report to the Finance Manager.

We recommend that payroll checkers should report to the payroll master. In addition, the internal audit department should establish its own routines for checking the payroll.

3 It was observed that the payroll is checked and approved four months after payment.

We recommend that data keyed into the payroll system should be checked and verified before the payroll is distributed.

Costing & Budgeting

The section is headed by a senior cost accountant (position currently vacant), supported by 2 junior cost accountants, 2 costing clerks and 1 budget clerk.

This section is responsible for :

- proper recording of stock movements;
- assisting in costing during the preparation of the budget;
- recording on all issue vouchers the moving average price of the issue concerned;
- obtaining the cost prices of any new stock and deriving the moving average stock value of current stock holding;
- pricing products;
- preparing monthly reports showing production, stock movement, sales, cost of sales and consumption of indirect and direct materials. This information is sent to the planning department;
- reconciling stock movement records with the stock recording ledger cards kept in the stores.

Weakness Identified and Recommendation

- The costing department only performs some of the above duties due to the absence of the senior cost accountant. It is primarily a recording department for stocks.

  We recommend that a senior cost accountant be appointed as soon as possible.

ii) **Commercial department**

This department is responsible for sales and purchasing, and is headed by the commercial manager.

Sales

The section is headed by a head of sales who is assisted by 3 sales clerks and is responsible for :

- recording sales;
- marketing and sales promotion;
- following up customer orders and special requests from production;
- quantifying sales targets from the production budget.

Purchasing

This section is currently split between Awassa and Addis Ababa (AA).

Awassa employs four clerks and is responsible for :

- purchasing from Ethiopian suppliers;
- preparing foreign purchase orders based on requests from stores;
- reporting on the annual raw materials requirement during the budgeting process;
- following up outstanding foreign purchase orders with the AA office.

AA employs four clerks, combining the sales and purchasing functions, and is responsible for :

- processing foreign purchase orders requested by Awassa purchasing;
- opening and processing L/Cs with the National Bank of Ethiopia;
- following up on L/C payments;
- following up goods in transit, goods at port and transport of goods to Awassa;
- reporting sales to management on a weekly, monthly, quarterly and annual basis.

The procedures used are as per the Ministry of Industry Accounting Procedures Manual.

2.3.2 Current Cost Centres

Spinning Department

There are currently 9 cost centres in the Spinning Department. The cost centres represent the individual processes used in the production of yarn. These cost centres are :

- Blowing
- Carding
- Combing
- Drawing
- Roving
- Ring Spinning
- Winding
- Doubling
- Twisting.

Weaving Department

There are currently 4 cost centres in the Weaving Department. The cost centres represent the individual processes used in the production of different fabrics. These cost centres are :

- Warping
- Sizing
- Weaving
- Brushing.

Finishing Department

There are currently 10 cost centres in the Finishing Department. The cost centres represent the individual processes used in the finishing of different fabrics. These cost centres/processes are :

- Singeing and desizing
- Bleaching and scouring
- Drying
- Mercerizing
- Dyeing
- Gigger
- Printing
- Stenter
- Sanforizing
- Folding and packing.

Overhead cost centres

Overhead cost centres are :

- Production workshop
- Electrical workshop
- Steam (boiler) and water
- Maintenance
- Production planning
- Quality control
- Distribution
- General and administration.

2.3.3 Financial Accounting System

ATF's accounting system essentially follows the procedures set out by the MoI (GoE) for all of the corporations under its control in a document entitled "Accounting Procedures Manual". Certain accounting procedures in this manual have been changed to reflect changes in GoE policy which have occurred since the manual was written. This has mainly been in the area of foreign purchasing where ATF can now acquire foreign exchange directly from the Central Bank through the recently introduced auction process. Further, ATF now has its own tender committee replacing that previously operated by NTC. In addition, autonomy of decision making has been granted to ATF management.

The organisation chart has been modified to reflect the re-organisation that has taken place with the abolition of NTC. This organisation chart has not yet been approved by ATF's board of management, thus managerial positions are all on an "acting" basis. (See section 3.2.7)

There is a budgeting system but it lacks a coordinated supporting management information system. Performance evaluation concentrates on production and sales with little evaluation of costs and expenses.

The finance department has suffered a high turnover amongst its senior staff. At present the following important senior positions are vacant :

- General Accounts Head;
- Costing and Budgeting Head.

It is only since January 1994 that the position of Finance Manager has been filled. Previously the finance department was headed by a junior staff member. This is probably the main reason why financial accounts are only produced on a quarterly basis.

2.3.4 Budgeting System

The ATF budgeting system is based on production plans rather than market demands. Annual production planning starts the budgeting process which is geared towards attaining full capacity with little regard to customer requirement or financial considerations.

ATF management's main problem is the political environment in which ATF commenced operations in 1989. From the time the factory was opened until 1992, government price controls and subsidies were in effect. The strategic objectives of the factory were to create employment in the Awassa area and provide affordable goods in Ethiopia.

ATF no longer receives government subsidies nor are prices controlled. The management does not yet seem ready to take advantage of their new freedom.

Since the removal of government subsidies ATF no longer exports its products. This has been due to the high cost of production making it difficult to compete abroad. This has resulted in a large stock of unsold finished goods.

The budgeting cycle is as follows :

1 The planning department requests all departments to prepare their annual requirements, including raw materials and manpower, and the proposed product mix. The material inputs are submitted to the commercial department for evaluation.

2 The planning department prepares the production budget by quantifying the departmental requirements. The production budget is compared with the sales budget. Working on the assumption that all production will be sold, the budget then goes through a series of iterations revising production levels upwards until a projected profit results.

3 The commercial department develops a purchase plan to meet budget requirements. The plan is divided into local and foreign purchases.

4 The planning department develops a consumption budget by cost centre based on standard input and output ratios in each department.

5 The planning department consolidates the budget and presents it to senior management for review and approval. Senior management includes the General Manager, the Deputy General Manager and managers from Finance, Commerce, Production and Planning departments.

6 Senior management reviews the budget against previous years' budgets. Revisions may be made and the budget subsequently approved.

7 The approved budget is then submitted to the Management Board for further review and approval.

8 From the approved budget, the planning department and the finance department jointly create a master budget which consists of a profit and loss account, balance sheet and a statement of sources and uses of funds.

9 The resulting master budget is used by the planning department who assumes the responsibility for monitoring and generating information. The budget is broken down to a quarterly, monthly, weekly and daily basis, for reporting and performance evaluation purposes.

10 The planning department monitors production levels and maintenance on a daily, weekly, monthly and quarterly basis. These reports are submitted to the senior management meetings which are held every Tuesday. Performance is reviewed and appropriate action taken.

11 Sales and incentive payments are reported on a weekly, monthly and quarterly basis. These reports are submitted to senior management for their weekly meetings.

12 Other reports prepared quarterly are achievement reports analysing production, sales, purchases, expenses and financial achievements. These reports are submitted to senior management, the Management Board and MoI.

Weaknesses Identified and Recommendations

1 The budget is driven by production to maximise machine utilisation and employment rather than profitability and the market.

We recommend that ATF should reset priorities and performance targets consistent with Ethiopia's overall targets in what is referred to as the transition period. We also recommend that the budget process should begin with a sales forecast from which will be derived all other subsidiary budgets such as production, labour, overhead, materials, capital, etc.

2 Actual performance against budget is monitored through reports prepared jointly by planning, production and finance for review at management meetings. The budget is not formally integrated with the general ledger.

In order to strengthen the actual vs. budget comparison, we recommend that a formal integration of the budget with the general ledger be undertaken.

3 During the year, no re-forecasts are prepared to allow for changed circumstances.

We recommend that, although the budget should remain intact as a benchmark of management's plan for the year, quarterly forecasts should be prepared to reflect changed conditions.

2.3.5 Purchasing System

Purchasing is part of the commercial department. There are also purchasing staff in the AA office who follow up on purchases, both local and foreign.

The current procedures are as follows :

1 The purchasing department is responsible for the procurement of most items requisitioned by user departments.

2 Purchase Requisition Notes (PRN) are completed in 5 copies and approved by the Commercial Manager and General Manager. The distribution of copies is as follows :

i) Supplier;
ii) Finance department;
iii) Commercial department;
iv) Chief of stores;
v) Book copy.

3 The head of purchasing verifies that items are not in stock from the **stock out notification form.** If items are in stock he advises the commercial management and the PRN is cancelled.

4 The request is presented to the purchasing department who requests quotations from at least three suppliers. There is no current preferred supplier listing.

5 Suppliers submit proforma invoices to the commercial department which invites the requesting department to evaluate the proforma invoices against their requirements.

6 The requesting department evaluates the proforma invoices and fills out an **evaluation sheet**. For foreign suppliers an **assessment form** is filled. This form is then submitted to the **Purchasing Committee** with a recommendation. The committee is made up of the commercial, production and finance department managers and the manager of the requesting department.

7 The committee evaluates and approves the identified supplier or revises the recommendation.

8 The approved supplier's invoice is then used to procure the goods from the supplier. For foreign purchases the AA office is notified about the approval and instructions given to acquire an L/C from CBE. The AA office is responsible for acquiring foreign exchange by participating in foreign exchange auctions. It is also responsible for progressing foreign orders and L/Cs.

9 The goods are received by the store and a Goods Received Note (GRN) is issued, with a copy to the purchasing department.

2.3.6 Stock Management

The stores management department is under the supervision of a chief of stores (COS) who is responsible for the following :

- **Raw Materials Store** - handles all cotton lint and waste
- **Spare Parts and General Store** - handles all spare parts, chemicals, dyestuffs and stationery supplies
- **Finished Goods Store** - handles all finished product from the factory.

Each of these stores is headed by a storekeeper who is responsible for stock management.

There is a stock recording section within stores management, which is responsible for recording all stock movement. The stock items number over 1,500.

The stores management division has three storekeepers, eight clerks, two tractor operators, two fork lift truck operators, two electricians and two crane operators.

The current stock procedures are :

Stock receipts :

1 When goods arrive, the relevant store keeper calls a representative of the requesting department to inspect the goods.

2 The storekeeper fills out an acceptance note and a GRN, if the goods are satisfactory to the requesting department. Otherwise he issues a **Damage/Missing/Wrong Specification GRN** and returns the goods to the supplier using a Delivery Note. In the case of foreign suppliers, the COS is informed and he informs the purchasing section of the problem with the goods supplied, for follow up and claims to be raised. The GRN has six copies, the distribution being as follows :

1st copy	-	Accounts (Costing Dept)
2nd	-	Stock Recording
3rd	-	Purchase Dept
4th	-	Stock Recording
5th	-	Storekeeper
6th	-	Book copy

3 The GRN is forwarded to the stock control clerk who updates the bin cards.

4 The stock recording clerk updates the stock record ledger card in the stock recording section using the copy of the GRN.

Stock issues :

1 A stock issue voucher (SIV) is completed in six copies when a properly authorised material requisition note (MRN) is received at the appropriate store for available items. For items not in stock, the COS is notified and he advises the purchasing department by commenting on the MRN

2 The COS reviews and approves the SIV for the issuing of the items. The recipient signs the SIV for receipt of items and keeps one copy. The other copies are distributed as follows :

1st copy	-	Costing dept
2nd	-	Recipient
3rd	-	Stock Recording
4th	-	Storekeeper
5th	-	Book copy

3 Bin cards and stock ledger cards are updated using copies of the SIV.

Stock Verification

4 The COS undertakes unannounced random checks on the bin and stock ledger cards. Any differences arising are reconciled or appropriate book entries made.

5 Quarterly and annual stock taking is carried out and stock sheets completed by an inventory crew composed of 3 people - one from the production department (the counter), one from the finance department (the recorder) and the storekeeper (to assist in locating items in the store). A report of their findings is issued to the inventory committee, composed of the DGM as chairman and the rest of the line managers as members.

Damaged goods :

6 For damaged goods in the store, a report is issued to the inventory committee by either the inventory crew or the COS.

Weaknesses Identified and Recommendations

1 Different stocks are not classified by annual usage value. Such a classification results in a tabulation, in descending order, of the Birr value of actual annual consumption enabling management to concentrate its efforts on those items with the greatest value. Thus, the financial effect of keeping stocks of high value items to a minimum is far greater in absolute terms than the same effort expended on items of much lower value.

No re-order quantities or maximum and minimum stock levels have been set to enable orders to be placed automatically based on expected consumption and delivery lead times. Purchasing activity is only initiated when a MRN is received.

We recommend that either trained stock clerks be recruited to implement annual usage classification, and maximum, minimum and re-order quantity routines, or existing stores personnel should be properly trained.

2 There are storage problems, especially for cotton lint. A large stock (six months supply), is currently being stored in the open. This could create quality problems as cotton is effected by rain and sunshine. This problem was caused by the receipt of one huge consignment of cotton lint which was donated by the US government to GoE, who passed it to ATF, the value to be treated as a long term loan.

We recommend that this cotton lint should be brought inside the factory under cover.

3 For the last four years there has been no reconciliation between physical and book stock records. The unreconciled difference now stands at 1.5 million Birr. No investigation has been conducted to establish whether these differences are the result of shrinkage, damage or theft.

We recommend that all relevant senior management should meet to establish whether this discrepancy is believed. If not, further investigations should take place. If so, it should be written off immediately.

4 During the physical stock take cotton lint bales are not actually weighed. The number of bales is counted. This is then multiplied by an average weight of a bale. There is thus no real physical stock take.

We recommend that proper stock take instructions should be written, specifying that proper measurements either by weight or by volume should be undertaken for every stock take. Enclosed in Appendix V of this volume are general stock take instructions which discuss the principal procedures that should be followed. More detailed instructions which take into account the characteristics of each store and cost centre, such as measuring W-I-P, should be documented.

2.3.7 Stock Valuation

Direct and indirect materials are recorded at the moving average cost (weighted average cost) on the stock record ledger cards during the course of the financial year. The moving average cost includes the following cost components :

- purchase price of goods
- transportation charges to the factory.

With respect to imported direct and indirect materials, additional expenses are incorporated to the total landed cost of the materials as listed below :

- custom duty and other clearing charges
- insurance
- freight charges (air or sea)
- bank charges.

Finished goods are valued using the average production unit cost.

Weaknesses Identified :

1 Costs related to goods transported to the factory with the company truck are not included in the total cost, thus understating their value.

2 No adequate provision is taken for obsolete, broken or defective materials.

3 Cost prices of the finished goods are not compared to their selling prices. No appropriate provisions are established to reduce the value of any stock item whose cost price is in excess of the selling price to ensure that finished goods are stated at the lower of cost or estimated net realisable value.

4 Finished goods are not reviewed by management to ensure that all stocks are saleable at least at their cost price and as a result no adequate provision is made for all deteriorated, old and slow moving stocks to reduce them to their net realisable value.

2.3.8 Cost Accounting System

The current existing process costing system follows the production flow. The production process consists of three main departments; Spinning, Weaving and Finishing. Within these departments production is further broken down into detailed processes. Costs are accumulated for each of the individual processes and transferred in total to the next process until the goods are transferred into the finished goods store. However, this exercise is only carried out annually and in retrospect, thus giving little useful information.

Variable Costs :

I) Direct Labour

Direct labour is defined as machine operators. Direct labour cost is captured directly from the monthly payroll report. The Payroll Summary sheet presents analyses by individual cost centre.

II) Direct Material

Direct material costs are captured from the stores issue vouchers (SIV) for stock issues to respective processes. SIV's contain details of the cost centre and the quantity issued. Valuation of the issue is carried out by the costing section. An allowance for waste is deducted from the quantity of material issued using a standard waste rate for each kilo of input.

III) Manufacturing Overhead

This includes all other manufacturing costs, including spare parts used, power consumption, depreciation of machinery and buildings, fuel and lubrication and indirect labour. The indirect labour is captured directly from the payroll summary. Indirect labour is defined as labour utilised but not directly involved in production of products. This includes labour involved in the servicing of machinery, production supervision and management and transportation of work in process.

The manufacturing overheads are apportioned to the respective cost centres by various ways; kilowatt hours for power consumption, direct charge of machinery depreciation to their respective cost centres, building depreciation by square metre to the respective cost centres.

IV) Non Manufacturing Overhead

These are mainly administration and marketing costs which are allocated directly to their cost centres.

V) Pricing policies

There is no formal pricing policy, pricing decisions are based on prior year's cost plus a markup of usually between 5% to 20%, unless there is a significant increase in the production costs during the year. One product (Twill), is currently sold at break even price, because of poor demand.

The current procedures are as follows :

STOCK DATA CAPTURE

I STOCK RECEIPTS

1 The costing department receives the original copy of the goods received note (GRN) from the commercial (stores) department together with a copy of the MRN.

2 The costing department matches the above documents to the supplier's invoice and derives the unit cost of the items purchased.

For local purchases, this is usually done by dividing the amount on the invoice by the quantity received.

For foreign purchases the costing department receives a copy of the accumulated cost sheet from the commercial department. This accumulates all of the costs incurred in bringing the goods to Awassa. These include marine insurance, bank charges, sea or air freight, customs duties, transit charges, transport and unloading. The unit cost is then derived by dividing the accumulated costs by the quantity delivered.

3 The unit cost is entered into the GRN and the financial ledger card (FLC). This entry is reviewed by the head of the costing section who signs as evidence of review. One FLC is kept for every major item, dyestuff, spares etc.

4 The moving average cost of material is then derived on the FLC. This is done by adding the previous total stock quantity and value to the newly received quantity and value. The new value is divided by the new stock quantity, to arrive at the moving average unit cost. This information is used to cost any subsequent issues to production until the next delivery is received, when a new moving average will be calculated.

II STOCK ISSUES

1 The costing and budgeting division receives the original copy of the Stock Issue Voucher (SIV) from the commercial (stores) department together with a copy of MRN from the appropriate department.

2 The moving average unit cost is entered into the SIV from the FLC. This is reviewed by the head of the costing section who signs as evidence of review.

3 The FLC is updated by the stock issue and a new balance derived.

4 On a monthly basis the Stock Issue Voucher Register (SIVR) is updated using the SIV. The issues are allocated by cost centre by general category.

5 A journal is then produced which debits individual cost centres and credits stock account.

6 The journal is reviewed by the head of the costing section and approved by the Finance Manager before submission to the general ledger clerk.

7 The general ledger clerk enters the journal onto the appropriate ledger card. The ledger cards are filed by cost centre code. The value of all issues to the cost centre are accumulated throughout the year.

8 The senior costing accountant uses the ledger cards to derive the cost of products by using process costing. The output is the average cost per unit of production at every production process stage and average cost per metre of the final products produced. Process costing is only carried out on an annual basis.

2.3.9 Process Costing

Process costing is conducted after year end by using the cumulative figures from the general ledger. This is the responsibility of the Senior Cost Accountant. Due to the vacancy in this position, the Finance Manager (previously the DGM) is currently responsible for producing the 1992/93 costing information.

Attempts have been made to forecast the cost per unit of products to be produced during the year. This forecast begins from the budgeted products at the finishing department and requirements in terms of labour, materials and overheads of individual cost centres are derived by moving backwards up to blowing department. The costs for the requirements are then calculated to obtain the total and unit cost of product for each cost centre.

The current procedures are as follows :

1 The Senior Cost Accountant receives annual cumulative figures from the general ledger. This is summarised by cost centre.

2 A manual spread sheet is prepared with the various products in columns by department. The spinning and weaving departments measure raw material in kilograms while the finishing department measures raw materials in linear metres. The input variables are in rows across all the articles.

3 At the foot of each cost centre column the value for the average unit production cost is calculated. The total cost of each cost centre is transferred to the next cost centre. This process continues until the goods are transferred to the finished goods store. At packing stage, the last cost centre, the average cost per linear metre of the various products is derived.

Weaknesses Identified :

1 Process costing is conducted only once per year after the year end, making the information derived unusable for effective management control.

2 Due to limited knowledge of the costing process within the finance department, only one person, the Cost Accountant can carry out the work. Thus no review is conducted of the data input, the process itself and the output.

3 The calculation does not take into account revenue from the sale of waste materials.

4 Waste percentages used are standard not actual.

Standard wastage rate of 6.5% for every kg used, in the blowing department, is used to calculate the waste. Waste is valued at a standard rate of 0.50 Birr/Kg.

The waste standards currently being used by both the costing process and production are the standards which were set during the start-up of the factory using Ethiopian cotton. Currently the cotton being used is from the US, and is of better quality. Actual wastage recorded is below standard.

5 No management information is produced from this system so no performance reports are provided on variances.

6 No variance analysis is conducted on usage of the various inputs, for example, labour hours used in the various processes to produce a metre of finished goods or raw materials used to produce one metre of finished goods. This information could be used to compare actual against standard usages.

7 No control account exists for the accumulation of individual cost centre costs.

8 Transfer documents between departments are not used to confirm the quantity of processed material transferred.

9 There is no costing manual to guide the costing staff on the various procedures.

10 The yarn store movement of materials is not reconciled to ensure that receipts from spinning and issues to weaving are the same. Any difference should be investigated.

11 The system does not take work-in-process (WIP) into account. Because process costing is only carried out annually movements in WIP are relatively less significant, although the total value of stock at 30 June 1993 is almost equal to twice the calculated cost of goods sold during the previous financial year. Thus any error in valuation of closing stock and WIP will cause an error of double that magnitude when calculating ATF's profitability.

12 All factory costs are absorbed into cost of production. When costs are high or production low (or both), unit costs escalate. If unit costs are then used to set selling prices there is an obvious danger of making the products unsaleable on price grounds.

It has been clearly identified that ATF's process costing system is not adequate. Recommendations for detailed changes are not relevant since our proposed system is designed to correct all of the weaknesses observed.

2.3.10 Payroll System

The payroll system is processed using a Dbase III program which was written when the factory was opened in 1989.

The payroll is prepared on a monthly basis for permanent workers and twice a month for daily casuals.

The current procedures are as follows :

New Employee

1 Administration department sends a copy of the letter of appointment to the finance manager who approves the letter for input into the computer master files.

2 The payroll master reviews the letter to ensure that all the relevant details and proper authorisations have been entered. The relevant information includes the date of appointment, the salary, the cost centre and the employee number. The letter then becomes the source document for entry into the computer.

3 The input clerk enters the relevant information into the master files. The clerk then prints out the information from the master file and submits it to the payroll master for review.

4 The payroll master reviews the printed information against the letter of appointment and signs the letter. This information is then sent to the Finance Manager.

Payroll Preparation

5 The payroll section receives attendance sheets, incentive payment, overtime and deduction information, which is entered into by the input clerks.

6 The master file containing the payroll information is printed and given to the payroll master. The payroll master verifies the payroll information against the report from the administration department. Any errors found are corrected. The payroll is printed again and given to the payroll master for final approval.

7 The payroll master cross compares the total figure against the previous month's payroll by adding new employees and subtracting leavers. Any discrepancies noted are corrected in the computer and a new payroll report printed. The report is forwarded to the Finance Manager for payment authorisation.

8 A payroll summary by cost centre is produced with pay slips for all workers. The summary report is used to update the labour expense ledger card in the general ledger section.

9 The payroll checkers check the payroll after the payroll is paid, ensuring that the payroll is reconciled to the source documents. Any discrepancy is investigated. Under payment is paid through a payment voucher. Overpayments are recovered from the following month's payroll.

Weaknesses Identified and Recommendations :

1 There are weak internal controls in the payroll section. Since the payroll section shares the computer with the production department sometimes the payroll process is done in a hurry and verification is not adequately conducted.

There are poor internal controls over the verification and reconciliation of payroll data. Verification is conducted four months after the payroll has actually been paid.

Proper control totals and segregation of duties should be devised and implemented. Verification must be carried out before the payroll is paid out. We also recommend that consideration be given to relocating one of the computers so that interruptions to payroll preparation and verification can be minimised.

2 There are no controls over physical access to the computer room; anybody can gain access. This is mainly due to the fact that the computer resources are shared among the production, planning and payroll departments. There are no controls, such as passwords, over access to the payroll programme. Master files can be accessed and amended with no audit trail.

See recommendation 1 above. In addition to the benefits stated, proper security steps could be introduced.

3 No documentation exists for the current payroll programme. Amendments to the programme are not documented by the programmers. This is the case for the incentive programme that was recently introduced.

Steps should be taken to properly document the basic system. Any subsequent amendments to the programme should not be accepted by the payroll department without adequate user documentation.

4 There are no appropriate backup procedures. The payroll master copies payroll information on two disks using the grandfather, father and son system. This information is stored in one location. No backups exist for the master files.

We recommend that additional (security) copies of all disks should be made as a routine and kept in a secure location away from the main factory site.

5 Employees are assumed to be working in the same cost centre throughout the year. The current system does not cater for time the employees are engaged on other different activities/cost centres.

As the sophistication of product costing systems increases accurate measurement and recording of costs will become more vital. A transfer system to enable wage and related costs to be transferred between cost centres should be devised and implemented immediately.

6 Neither the input clerks nor the payroll master have received proper training.

A training programme should be devised and implemented.

3 PROPOSED SYSTEM

3.1 INTRODUCTION

Briefly, the system which we have devised is a full absorption costing system using only 8 cost centres. All direct material and labour costs are allocated directly into these cost centres whilst appropriate production indirect costs are fully apportioned to the cost centres on the most appropriate basis. Indirect labour and overhead costs are then apportioned to the products produced in those cost centres on bases related to the relative "consumption" of these inputs.

Full costs of production will be produced quarterly using the financial accounts which are also prepared to this same timetable.

The major outputs from the system will be two-fold :

- first, a cost report for each cost centre showing the cost either per kg or per linear metre of each output from that cost centre;

- second, a product cost summary for each product which ATF sells. This will summarise material, labour and overhead costs per unit of output in each cost centre in which that product is processed.

Examples of the format output appear on the subsequent pages.

Wherever possible, we have used existing documentation and routines as input to the system. This statement applies in particular to routines for charging costs of materials and also for accumulating output by department. In both cases ATF has well established and satisfactory routines (although they might well be streamlined by some intelligent systems analysis).

The decision to use only 8 cost centres instead of the previous 27 has been made for the sake of simplicity without undue loss of precision. In no case have we created new cost centres other than by amalgamation of existing ones. Thus in the future, when confidence in the system has built up, additional cost centres can be re-introduced by splitting our proposed 8 along the previous lines.

3.1.1 Absorption vs Standard Costing Systems

In this report, we recommend that ATF implement a manual, absorption costing system.

Absorption Costing

Absorption costing is the traditional form of cost ascertainment. It is based on the principle that all costs should be charged to (or "absorbed into") whatever is being produced.

COST SHEET - BLOWING/ROVING - COST CENTRE 1

QUARTER						
ENDED						
	TOTAL		SLIVER Ne 0.82		SLIVER Ne 1.20	
	Kg	Birr	Kg	Birr	Kg	Birr
Opening W-I-P						
Materials						
Direct Labour						
Indirect Labour and Overhead						
Total Input						
Unit Cost						
Less: Process Transferred						
Waste						
Closing W-I-P (book)						
Unaccounted (loss)/gain						
Closing W-I-P (physical)						

COST SHEET DYEING/PRINTING - COST CENTRE 7(c) - ALL FABRICS

DATE: _____

FABRIC CODE: _____

FABRIC TYPE: _____

DYE _____ **PRINT** _____ **DYE/PRINT** _____ **BLEACH ONLY** _____

DYE COLOUR/FORMULA NUMBER: _____

PRINT DESIGN/FORMULA NUMBER: _____

	Birr	lm	Birr/lm
Total cost for fabric type (without finishing chemicals and dyes)			
Direct finishing chemicals and dyes			
Total cost of finished, packed product			

Under an absorption costing system, factory overheads are allocated to a cost centre on a fair share of an overhead on the basis of the work done in the cost centre in respect of the facilities provided by the overhead.

If an overhead cannot be directly allocated to a cost centre then it is apportioned. This involves using some basis of apportionment that enables the overhead to be equitably shared between cost centres.

After allocation and/or apportionment of all costs to cost centres, the total cost for each cost centre is apportioned to all of the products which were processed through that cost centre during the period concerned.

Apportioned should be carried out on a basis which reflects the proportion of the cost centre's capacity utilised by the product concerned. For example, if product A requires twice as long per unit to be processed than product B, product A should have apportioned to it twice as much per unit of the total costs of operating that cost centre.

Once total product cost is known, theoretically it can be used for setting selling prices of the output. In practice, this must be done with extreme care. For example, where production is low and/or costs are high in any one accounting period, unit costs will be high. It may prove impossible to sell the product at a price which even covers the calculated cost. Obviously, in such a case, selling prices must be set at a market determined rate.

Standard Costing

A standard cost is the predetermined cost of manufacturing a single unit during a specific period.

In simple terms a standard costing system uses this predetermined cost as a measure against which actual costs are compared. The inevitable difference between the two is reported as a variance. One of the more powerful features of a well designed standard costing system is the ability to analyse this reported variance into its causal factors.

For example, the actual raw material costs of output during a specific period may be exactly equal to standard, thus giving rise to an apparent "nil" variance. However, analysis of this "variance" might reveal that actual consumption was higher than standard (an unfavourable usage variance) but that this has been exactly offset by a lower than standard buying price for the materials used (a favourable price variance). Having performed this variance analysis, management are then armed with information to initiate appropriate action.

Although called a standard costing system, it is also possible to extend any system to provide useful information on sales performance.

This is carried out by setting standard selling prices per unit of output. If actual sales revenue for the period concerned is higher than budget, this variance could be analysed between the following possible variances :

- volume - i.e. total unit sales higher than budget;
- price - i.e. unit selling price higher than budget;
- mix - i.e. sales of higher value items relatively higher than those of lower value items;
- exchange rate - i.e. sales in foreign currency might have achieved the standard selling price, but more Birr might be received when that foreign currency is exchanged

The objectives of standard costing are :

- to provide a formal basis for assessing performance and efficiency;
- to control costs by establishing standards and analysing variances;
- to enable the principle of "management by expectation" to be practised at the detailed, operational level;
- to give a reliable and consistent method of setting selling prices;
- to assist in setting budgets;
- to motivate staff and management;
- to provide a basis for estimating;
- to provide guidance on possible ways of improving performance.

A standard costing system can be either manual or computerised. However the timeliness of reporting will generally be considerably improved if a computerised system is used.

3.1.2 Justification for Absorption Costing

We have chosen an absorption costing system because it can be implemented at ATF immediately. This is because many of the routines required for its implementation are in existence already. Further, the existing process costing system needs little adaptation for the integrated absorption costing system.

Implementation of a standard costing system requires appropriately trained staff to set standards and to operate the system. As mentioned elsewhere there are gaps at senior level in the finance department. There are also no industrial engineers at ATF at present to assist in setting standards.

3.2 OUTLINE OF PROPOSED COSTING SYSTEM

3.2.1 System Description

Because of the large amount of work which would be involved in setting labour standards at present, the costing system to be adopted will be "full absorption" rather than "standard". (There are exceptions to this in the finishing section - the reasons for these exceptions will be explained below).

Our proposed system will operate initially on a quarterly basis to suit the company's current financial accounting cycle. All of the routines to be adopted in the proposed costing system can operate to any cycle length chosen - the only requirement is that the financial accounts should operate to the same cycle (or one more frequent).

For ease of stock counting we propose that all quarters should end at a week-end, not on the last day of the relevant month. This should assist in making the count of stock and WIP more accurate since stocks should not be moving at the time they are being counted.

This proposal has two implications which should be mentioned for consideration by management :

- by adopting quarters of 13 weeks ending on Saturdays it will mean that every 4 to 5 years there will need to be a "53" week year and a "14" week quarter;

- when it is decided to produce "monthly" cost accounts an "accounting period" of 4 or 5 weeks should be chosen so that stock counting will still occur at a week-end. The usual pattern is to have three accounting periods of 4, 4 and 5 weeks each per quarter.

As far as possible we have used existing recording routines to avoid duplication of tasks.

We have proposed a significant reduction in the number of cost centres. However, in all cases this is merely by amalgamation of existing cost centres. A chart showing the existing and proposed cost centre structure is attached as the last page of this section of the report. (Other than by amalgamation of those cost centres shown we are not proposing any changes to other cost centres). A department may consist of more than one cost centre.

Absorption Costing

For the purposes of this report absorption costing means that the total cost of operating the factory is spread over the output of the cost accounting period in question. The most important implication of this is that unit costs will be high in any accounting period in which either output is low or costs are high (or both). Without going into the benefits of marginal standard costing at any great length it is possible that actual reported costs under an absorption costing system may be so high that it is impossible to sell the goods produced at a profit. This may cause poor decisions to be made. A move to a standard costing system would alleviate such problems.

To achieve this spread of total costs the following procedure will be followed :

- direct labour costs will be allocated to each cost centre through the normal payroll routines. (A definition of direct labour cost is given in the procedures manual. Section 2.3). Labour costs for all other cost centres will be treated as overhead costs;

- after the production of the financial accounts for the quarter the overhead costs as reported will be apportioned to the individual cost centres in the most appropriate manner;

- for every department except finishing, materials will be charged to the cost centre using the current materials booking system. At the end of each quarter a full physical stock count and evaluation for each raw material store will be carried out with a reconciliation against book stock. Where a stock discrepancy is found an adjustment should be made to every issue from the department concerned in the subsequent quarter to uplift (in the case of a stock loss) the value charged to the cost centre by the percentage value equivalent to the stock loss of the prior quarter. (In the case of a stock gain this should be carried forward to the next stock count as being more likely to arise from book keeping error than physical gain);

- after adjustment for movements in WIP and recorded scrap the total costs of materials, labour and overheads will have been charged to the finished output of the cost centre concerned.

For most cost centres the output will be the measured amount of product produced during the period in question. For spinning department this measure will be in kg of yarn produced, with an adjustment for differing counts to take account of the fact that the finer counts will take longer to process and thus will absorb more overheads and labour. For other departments prior to finishing, the unit of output will be linear metres of the various types of fabric produced. At present all fabrics are 150cm wide. If this changes so that fabrics of different widths can be produced, output will need to be measured in square metres.

In the case of the finishing department the output is complex. See earlier chart of possible routes of differing finished goods through this department. Output is still measured in linear metres but the number of types of output is enormously more complex because of the large range of different colours and finishes. To achieve this wide range of outputs there is a wide range of different process routes through the department. Also colours and dyes are used in varying combinations to achieve the various designs and finishes.

To allocate labour and overheads to the various products produced during the period it will be necessary to record hours spent on each machine by a specific batch. A transfer voucher will be used to accompany each batch of fabric throughout the department to record these hours. This is an established routine.

For overhead allocation in the finishing department it is assumed that each machine attracts overheads at the same rate i.e. one hour on machine A will cost the same as one hour on machine B.

For labour allocation the manning of each machine will also be taken into account. For instance, if machine A is manned by five people and machine B by two, the labour cost per machine hour of A and B will be allocated in the ratio of 5 to 2.

For chemicals and dyes it is not possible to allocate actual usage to products. However, for each product produced (including each variant of design) there is a "recipe" giving the amount of each chemical and dye used to produce 1,000 linear metres of output. The only practical way at present of costing these items to the products is to use the amount as specified in the relevant recipe. This is, in effect, a standard costing approach, although no variance will be measured as a routine. It also differs from a full standard costing approach because the weighted average (i.e. actual) cost of each material will be used. Thus, every issue could have a different unit material price. However, an overall comparison will be made between book stock of chemicals and the physical valuation whenever that is established. Any resulting variance will then be attributed to costs of production.

Quarterly costing reports

At present financial accounts are only produced on a quarterly cycle. Even then, their production is delayed after the end of the quarter in question. The major reason for this delay is a lack of senior financial staff. Routines exist but they are not able to be followed. The fact that they are only produced quarterly and not monthly is also attributable to the lack of senior staff. Part of the terms of reference for this study is for recommendations to be made for a subsequent transition to a standard costing system. This specific item is covered in a separate section of our report. However, the production of monthly absorption cost accounts will produce an immediate improvement in the quality of the information available to management with little in the way of changed routines and procedures. As soon as possible this should be introduced.

Cost centre structure

The chart on the following page shows our proposed cost centre structure, set out side by side with the existing structure for ease of comparison.

Current and Proposed Cost Centres

Department	Current Cost Centres		Proposed Cost Centres	
Spinning:	1	Blowing	1	Preparatory
	2	Carding		"
	3	Combing		"
	4	Drawing		"
	5	Roving		"
	6	Ring spinning	2	Ring frame/winding
	7	Winding		"
	8	Doubling	3	Doubling/twisting
	9	2 for 1 twist		"
Weaving:	10	Rewinding	4	Direct warping/sizing
	11	Direct warping		"
	12	Sizing		"
	13	Drawing		"
	14	Weaving	5	Weaving/brushing
	15	Brushing		"
	16	Inspection		"
Finishing:	17	Singeing/desizing	6	Pretreatment
	18	Scouring/bleaching		"
	19	Drying		"
	20	Mercerizing		"
	21	Dyeing	7	Printing/dyeing
	22	Inspection		"
	23	Gigger		"
	24	Printing		"
	25	Stenter		"
	26	Sanforizing		"
	27	Packing	8	Packing

3.2.2 Reporting requirements

Information Requirements for Senior Management and Production Managers

One of the keys to the success of any management team is a well designed and timely management information reporting system. The information received by each manager should be relevant to his needs, timely, and concise.

From a factory (production) management point of view, these reports can be broken into three broad categories.

1 Quality reports
2 Production and performance reports
3 Variance analysis reports

Taken together, these three types of report should provide a comprehensive picture of the performance of an organisation. The synergy between these report types is critical. For example, production quantity reports and machine utilisation reports can be dangerously misleading unless production quality reports for the same period are also analysed.

3.2.3 Proposed Cost Centres

The proposed cost centres have been redefined to re-group the processes/cost centres with the objective of instituting a responsibility accounting reporting system.

The proposed cost centre structure is as follows :

Cost Centre Number	Cost Centre Title	Processes and Activities	Description of output from Cost Centre
SPINNING DEPARTMENT			
1	Blowing/Roving	. Blowing . Carding . Precombing Drawing Frames . Silver Drawing Winder . Combing . High Speed Drawing Frames . Roving frames.	Different sliver counts for use in the preparation of different yarn counts. The sliver count can either be passed on to the Ring Frame-Winding or Ring Frame-Twisting cost centre.
2	Ring Spinning/Winding	. Ring Spinning Frame . Winding.	Different yarns that are not doubled or twisted. These are passed to the yarn store as finished product or doubling/twisting.
3	Doubling/Twisting	. Doubling . Twisting. *** YARN STORE	Different yarns that are doubled and twisted. These are passed on to the yarn store as finished product.
WEAVING DEPARTMENT			
4	Warping/Sizing	. Direct Warping . Rewinding . Sizing.	Different warp beams of different specification for the weaving section fabric requirement. The warp beam is stored in the loom store awaiting requests from the weaving section.

Cost Centre Number	Cost Centre Title	Processes and Activities	Description of output from Cost Centre
5	Weaving	. Weaving . Brushing. ** INSPECTION (UNDER QUALITY DEPARTMENT) *** GREY FABRIC (STORE MANAGEMENT)	Different beams of fabric. The fabrics are passed on to the Grey Fabric store as finished product.
FINISHING DEPARTMENT			
6	Fabric Preparation	. Singeing and Desizing . Scouring and Bleaching . Mercerizing . Cylinder Drying.	Bleached fabric.
7	Dyeing/Printing	. Stentering . Printing . Dyeing . Stentering . Sanforizing.	Printed, dyed or dyed and printed fabric.
8	Packing	. Folding and Rolling . Packing	Final finished cloth, which is transferred to finished goods store.

OVERHEAD CATEGORIES

Manufacturing overhead departments are :

- Production Workshop
- Electrical Workshop
- Steam (Boiler) and Water
- Maintenance
- Production Planning
- Quality Control.

Non manufacturing overhead departments are :

- Selling and Purchasing
- General and Administration.

3.2.4 Allocation of Costs to Output of Cost Centres

In general, the total labour and overhead cost of each cost centre must be apportioned to the output of that cost centre for the period in question. Since the output consists of different products some way must be found of totalling these outputs in a meaningful way that will allow these costs to be "spread" over output in a way which reflects the relative amount of resources consumed. To do this we use an equivalence factor which will allow the total output of each different product to be added together.

Example - Allocation of Costs to Products - Cost Centre 1

There are at present, two possible different outputs from cost centre number 1. They are "sliver" of differing diameters i.e. Ne 0.82 and Ne 1.20. After appropriate processing through cost centres 2 and 3, the former becomes yarn of count numbers 14, 16 or 20, whilst the latter becomes yarn of count number 32. The basic processing difference between the two products is the length of time spent on the roving machines.

Target throughput of the two products from roving is :

Product	Grams/hour
Ne 0.82	1,036
Ne 1.20	575.

As would be expected, the finer "sliver" takes more time to process per kg, thus attracting more overhead and labour cost per kg.

In this example therefore, the allocation of overheads and labour will be performed as follows :

- assume that the relevant information for cost centre number 1 for the period in question is :

-	overhead costs		10,000 Birr
-	labour costs		3,000 Birr
-	output -	Ne 0.82	85 kg
-	output -	Ne 1.20	103 kg

- first, we have to total the production for the period. To do this we must express the production of the different products in "equivalent units". The equivalence we have used is hours on the roving machines thus giving :

Total output = (output Ne 0.82) + (output of Ne 1.20 x $\frac{1,036}{575}$)

$= 85 + 103 \times \frac{1036}{575}$

$= 85 + 185.6$

$= 270.6$ equivalent units;

- second, we calculate the overhead and labour costs per equivalent unit. This is simply 10,000 Birr and 3,000 Birr divided by 270.6, or, 36.95 Birr and 11.09 Birr respectively;
- third, we calculate the overhead and labour cost per kg of output of the two products. For Ne 0.82 these costs are obviously 36.95 Birr and 11.09 Birr. In the case of Ne 1.20 the calculation is:

Overheads

36.95 Birr x $\frac{1036}{575}$ = 66.57 Birr per kg

Labour

11.09 Birr x $\frac{1036}{575}$ = 19.98 Birr per kg.

The integrity of these calculations can be checked by multiplying the two outputs by their respective allocated overhead rates :

Ne 0.82	85 kg x	36.95 Birr/kg	=	3,140.75 Birr
Ne 1.20	103 kg x	66.57 Birr/kg	=	6,856.75 Birr
		Total	=	9,997.50 Birr

the small difference between this total and the total overhead cost of 10,000 Birr being due to rounding.

TABLE DESCRIBING METHODS OF COST CHARGE/ALLOCATION OR APPORTIONMENT OF VARIOUS INPUTS INTO EACH DEPARTMENT

DEPARTMENT	MATERIALS	LABOUR	OVERHEADS
Spinning	Mainly cotton lint - by weight. Output of yarn is also measured by weight. No allocation required - 1 kg of any count has same material cost.	Labour and overheads are allocated to the different yarns according to the throughput on the machinery. Finer yarns take relatively longer per kg of output and thus attract a greater proportion of the overheads and labour. See accompanying text for further explanation and a worked example. All three cost centres in this department will be costed in the same manner. As a reasonable approximation, all yarns follow similar routing.	
Weaving	Input is mainly cotton yarn with some sizing chemicals. Cotton yarn input by weight - sizing chemicals at standard formulation measured by weight priced at weighted average cost. Output is entirely in linear metres of one of six grey fabrics.	In the same manner as for spinning, both labour and overheads are allocated to the six fabrics according to time spent on the relevant machines. All fabrics follow the same route through the two cost centres but at different rates.	
Finishing	Input is linear metres of grey cloth plus chemicals, dyestuffs, etc. Output is linear metres of finished cloths. Input of chemicals and dyestuffs at standard formulation per 1,000 linear metres. Measured by weight and priced at weighted average unit cost.	Labour is to be allocated in a similar manner to overheads except that different manning of different machines is allowed for.	Output is complex with a variety of machines. Fabrics follow a variety of routes between the various machines in the department. Overheads are to be allocated according to time spent on any machine in the department. A routing card will accompany each batch of fabric through the department.

3.2.5 Integration with Financial Accounting System

The present process costing system, used for annual budgets and for the establishment of costs retrospectively is linked with the financial accounting system because it uses as its base data, figures from the annual financial accounts.

The proposed absorption costing system is designed to be fully integrated with the financial accounting system. In order to achieve this integration it has been necessary to complete the following steps :

a) Review registers, journals and documents currently used as posting sources to the general ledger for all manufacturing costs, sales and stock transactions. Determine if the same sources can provide all the necessary information to the absorption costing system.

b) Review current general ledger chart of accounts to understand all accounts presently used to collect direct, indirect and manufacturing overhead costs; sales revenues accounts; and all related balance sheet stock accounts.

c) Propose changes to the chart of accounts to accommodate the absorption costing system and ensure the chart of accounts is still in compliance with MoI requirements.

d) Review current adjustments and allocations made in the general ledger to manufacturing costs, sales revenues and stock accounts for financial statement presentation purposes.

e) Propose revisions to these adjustments and allocations to accommodate the absorption costing system while still ensuring compliance with MoI requirements for financial statement presentation purposes.

f) Review financial statements and notes to the accounts prepared currently in compliance with MoI requirements in order to design management reports from the absorption costing system which can be easily agreed to the financial statements and notes to the accounts.

g) Design appropriate records to be kept by the costing department and establish procedures to integrate with the financial accounting system.

The results of completing the above steps are as follows :

a) The current sources for posting financial transactions relating to manufacturing costs, sales revenues and stock accounts to the general ledger are :

   i) cash payments vouchers (CPV);

   ii) cash receipts vouchers (CRV);

   iii) monthly payroll (PAY);

   iv) consumption summary (CONS);

v) goods received notes (GRN);

vi) stock issue vouchers (SIV);

vii) finished products summary (FPS);

viii) depreciation schedule (DEPN);

ix) medical claims schedule (MED);

x) petty cash payment vouchers (PCPV);

xi) sales journal (SJ);

xii) journal vouchers (JV).

We examined all of these and see no need for any additional documents.

It will be necessary, however, to make the following modifications and enhancements :

i) all transactions which effect manufacturing costs should be posted to the appropriate costing department registers;

ii) the payroll system should be changed so that all direct and indirect labour employees are assigned to the newly defined cost centres;

iii) the payroll system should be summarised by cost centre including both direct and indirect labour and including all emoluments whether salaries or employee benefits;

iv) the summary should be given to the costing department for inclusion in the labour register maintained by month and by cost centre;

v) the financial accounting department should give the costing department details by cost centre of any payroll related payments made outside the monthly payroll eg CPV or PCPV for payroll adjustments;

vi) the depreciation schedule should be enhanced to include a column showing the cost centre in which each fixed asset is located and to total depreciation by cost centre for inclusion in the costing department manufacturing overheads register;

vii) sales and cost of goods sold should be posted to the general ledger by product to provide the necessary information for product profitability analysis;

viii) all staff involved in preparing any posting source documents should be trained to understand the new cost centre structure;

ix) stores which issue materials to the production process are not included in any cost centre: hence, all issues of materials should be done by SIVs.

x) waste and unaccounted losses per costing sheets should be charged to new accounts set up for each cost centre.

b & c) The table below lists the general ledger accounts currently used to collect manufacturing costs, sales revenues and related balance sheet stock accounts. It also lists our proposed changes to the chart of accounts.

Current Acct no.	Description	Proposed Changes	Type of Cost
1406	Sundry debtors	No stock adjustments	
1500 series	Stock accounts	No change	
2102	Sundry creditors	No stock adjustments	
4101-4301	Sales revenues	Sales by products	
4600	Other income	No change	
4702	Waste sales cr	No change	
5101-5127	Direct materials	New cost centres	D
5201-5227	Indirect materials	New cost centres	I
5301-5327	Direct labour	New cost centres	D
5401-5427	Indirect labour	New cost centres	I
5601-5627	Waste	New cost centres	D
5701-5727	Unaccounted loss	New cost centres	D
5901	FG contra acct	No change	
6101	Prod O/H labour	No change	I
6102	Employee benefits	No change	D & I
6103	Depreciation	No change	D & I
6104	Repairs & maintenance	No change	D & I
6105	General	No change	I
6201-6701	Workshop expenses	No change	D
6211-6711	Workshop allocation	No change	I
7101	CoGS contra acct	CoGS by product	

Notes - All 6000 series accounts have subledgers maintained by MoI object of expense subcodes
Type of cost refers to direct cost (D) and indirect cost (I).

d) Currently the only adjustments made in the general ledger after posting of financial transactions from posting sources are :

i) those to allocate workshop expenses to manufacturing overhead accounts (6211-6711 to 6101-6105) and

ii) those to record book to physical stock differences.

e) The first group of adjustments should be continued and copies of the adjustments given to the costing department for inclusion in the manufacturing overhead register and overhead allocation worksheet. The second group of adjustments are presently being booked to sundry debtors and creditors. This practice should be stopped. Stock differences between book and physical values should be investigated immediately and proper adjustments and/or write-offs made as required. The costing department should be given details of such adjustments in order to update cost centre records.

f) We reviewed the financial statements and the notes to the accounts currently prepared. The following financial statements and notes to the accounts are relevant to the integration of the financial accounting system with the absorption costing system :

i)	Balance sheet		
ii)	Profit and loss account		
iii)	Note 1	-	Accounting policies
iv)	Note 4	-	Stock
v)	Note 13	-	Sales
vi)	Note 14	-	Cost of goods sold
vii)	Note 15	-	Other income

The financial statements and notes are attached as Appendix I

After examination of the profit and loss statement and the balance sheet, we recommend that the following should be the points of agreement between the financial and cost accounting records :

1) cost of goods sold;

2) value of production and packing materials received in the factory;

3) value of stock and W-I-P of production and packing materials.

Cost of Goods Sold

The profit and loss statement for the company (see page 1 of Appendix I) shows a cost of goods sold for the year Birr 26.14m. However, at the specific request of UNIDO, Vienna, we have included as many of the total expenses as possible into costs. The following adjustments will therefore be made to the figure quoted above :

		Birr m	Birr m
Stated cost of goods sold			26.14
Less : Other Income			
Service income	O	0.05	
By product sales	M	1.09	
Waste sales	M	0.35	
Equipment rent	O	0.06	
Container, packing wood, etc	O	0.21	
Dyeing and printing services	O	0.26	
			(2.02)
Add : Expenses			
Administration	S	2.89	
Interest	S	5.21	
Audit fee	S	0.02	
			8.12
Revised cost of goods sold for agreement with cost accounting records			32.24

In the table above, the letters O, M and S have been used against the values of the income and expenses shown. Their use is to indicate the method of inclusion in the revised cost of goods sold as follows :

O - these items are credits for services rendered and should be used to reduce the overhead cost of the cost centre giving rise to the credit;

M - these items are credits for materials sold. They should be used, whenever possible to reduce the materials costs of the cost centre which produced the waste or by-product concerned. Where this is not possible, they should be credited to cost centre 1 where they should reduce the value only (not the weight) of cotton lint input;

S - these items are overhead expenses, the method of apportionment to cost centres being specifically set out in the table on page 62 of Volume I.

We have therefore not included the following costs in absorption costing :

		Account no.
i)	Distribution expenses;	8100 series
ii)	Corporation levy;	8299
iii)	Capital charge;	8271
iv)	Amortisation of deferred expenditure;	8250
v)	Doubtful debts expense.	82104

Value of Production and Packing Materials Received in the Factory and Value of Stock and W-I-P of Production and Packing Materials

In the table which directly follows this text, the materials balances of all cost centres and relevant raw materials stores are summarised for the period. After cancellation of transfers in and transfers out (i.e. transactions between cost centres and stores within ATF), this table will indicate global values for ATF and which will agree with the financial books of account in both of the above aspects.

ATF - RECONCILIATION OF COST CENTRES AND STORES TO FINANCIAL ACCOUNTS

BIRR	OPENING STOCK AND W-I-P	RECEIPTS INTO FACTORY	TRANSFERS IN (PREVIOUS STORE OR COST CENTRE)	TRANSFERS OUT (NEXT STORE OR COST CENTRE)	COST OF GOODS SOLD BY FACTORY	CLOSING STOCK AND W-I-P
LINT COTTON STORE						
SPARE PARTS & GENERAL STORE						
BLOWING/ROVING						
RING SPINNING/WINDING						
DOUBLING/TWISTING						
YARN STORE						
WARPING/SIZING						
WEAVING						
GREY CLOTH STORES						
FABRIC PREPARATION						
DYEING/PRINTING						
PACKING						
FINISHED GOODS STORE						
TOTALS						

This form brings together information from all cost sheets together with information on receipts into stores by the factory.

When properly completed total stock and WIP from this form will agree with the appropriate balance sheet entry. In addition, the two columns entitled "Receipts into Factory" and "Sales from Factory" will equal the corresponding figures from the quarterly financial accounts.

It is important that the following is noted :

- currently dyes, chemicals etc are held in the same store as spares and stationery. The former are direct materials and will be issued to cost centres for treatment as described in the notes to the completion of the appropriate cost sheet. The latter are indirect materials and will be treated as overhead costs. Whilst physical segregation is desirable it is not essential. However, the value of direct materials in this store must be kept separate

- in general stores of intermediate product eg yarn, warp etc should be counted and valued as stock in the cost centre in which they were produced. The exception to this rule is for the grey fabrics store which must be counted as a separate location because it must cater for the receipt of grey fabrics from other factories

- many of the entries in the "Transfers In" and Transfers Out" columns will cancel. Waste should be treated as a "Transfer Out". The net difference between the totals of the two columns will be represented as in the following equation :

  Transfers In (of raw materials)

  \+ Direct Labour

  \+ Overheads

  _ Transfers Out (of waste)

  $\pm$ unaccounted gain/(loss)

  = Transfers Out (of finished goods into finished goods store).

  As we have said earlier, ATF actual reported profits and/or losses will not be changed by **any** method of cost accounting. (One possible proviso to this statement is that a good cost accounting system by providing management with good information may assist them to make the right decisions and thus improve the performance of the organisation).

If selling prices are determined by uplifting unit costs by a given percentage which is determined in order to cover other expenses plus profits, it is obvious that given percentage will be differently set according to whether other expenses have been included in manufacturing cost or not.

g) The process of integration means that, in total, the cost accounting records and the financial accounting records agree, or, if thev do not agree that this failure to agree is for known and planned reasons. Thus, the exclusion of the expenses listed above, means that the two sets of records do not agree, but this is planned and the exact difference can easily be established.

The mechanism by which agreement is ensured is by the use, wherever possible, of the same source data for both systems. Where an entry is made in one set of books only, it must also be captured for inclusion in the other.

To ensure the information maintained and prepared by the costing department can be agreed or reconciled with the financial accounting records, we recommend that the costing department maintain the following four types of register :

i) Materials register;
ii) Labour register;
iii) Manufacturing register;
iv) Transfer cost register.

Examples of these registers can be found in the procedures manual.

These are discussed below.

i) Materials register

This is a register of all material issued from various stores to production i. e. - cost centres. At present there are four stores which issue materials to cost centres, namely :

1) Raw materials (cotton lint);
2) Yarn store;
3) Grey fabric;
4) Spare parts and general (chemicals, dyes).

Each store maintains a record of goods issued and received. All goods received are recorded on goods received notes (GRNs). All issues are recorded on stock issue vouchers (SIV). For financial accounting purposes, GRNs are totalled and recorded in the goods received summary.

Dr Stores
Cr Liabilities or WIP

SIVs are totalled quarterly and recorded in the consumption summary (CONS) for posting to the general ledger as :

Dr Direct material - cost centres
Cr Stock - raw materials, WIP or spares

The materials register should be set up so that each time materials are issued, the appropriate new cost centre is charged (debited).

Any other materials charges to cost centres made outside materials issues and transfers, such as payments made by CPVs or PCPVs, should be given to the costing department for posting to the materials register to the appropriate cost centre. Such payments should be kept to a minimum and established GRN and SIV procedures followed whenever possible.

At the end of the quarter, the materials register should be totalled by cost centre. The total of materials issued should be checked against the amount charged to the cost centre in the general ledger and checked against the amount of material received per the cost centre costing sheet.

ii) Labour register

This is a register of all emoluments paid to staff involved in manufacturing. Such emoluments include basic salaries, overtime, leave pay, pension benefits, medical benefits etc.

ATF payroll is paid on a monthly basis and summarised for posting to the general ledger as follows :

a) direct and indirect labour (except for employee benefits) is posted to cost centres;

b) employee benefits are posted to acct no. 6102- employee benefits;

c) all salaries and employee benefits for workshops and other departments such as administration, distribution etc. are charged to those departments.

The costing department should be given a summary by cost centre of payments for direct and indirect labour, including employee benefits. The costing department will maintain a register by cost centre recording monthly direct and indirect labour charges.

Other types of payroll costs arise from the hire of casual workers, medical insurance claims, payroll adjustments made outside the payroll system and miscellaneous petty cash voucher payments. When payments of this nature are made, personnel executing such payments, should classify the payments to direct labour, indirect labour or overheads. Direct and indirect payments should be summarised by cost centre and given to the costing department for inclusion in the labour register. Overhead payments will follow the procedure setdown for allocating workshop expenses to various manufacturing overheads (see iii following).

At the end of the quarter, the labour register should be totalled by cost centre. The total of labour charged to each cost centre should be reconciled to the amount charged to the cost centre in the general ledger. The reconciling amount between the financial accounting and the costing system should be the employee benefits total for the cost centres. The total labour per cost centre from the labour register should be entered on the costing sheet for each cost centre.

iii) Manufacturing overheads register

This register contains details of all non material or non labour payments which are manufacturing related. Examples of such overheads are :

Electricity and water;
Repairs and maintenance;
Insurance;
Furnace oil;
Water treatment chemicals.

Such payments are posted in the general ledger either directly to cost centres or to various workshop departments which support manufacturing. These departments are :

6201	-	Production workshop;
6301	-	Electrical workshop;
6401	-	Steam, boiler and water treatment;
6501	-	Maintenance workshop;
6601	-	Production planning;
6701	-	Quality control department.

Such departments are currently cleared quarterly in the general ledger by apportioning costs to users on a predetermined basis (using 6 x 11 accounts). It should be noted that not all costs collected in these departments are apportioned to manufacturing since some workshop costs relate to administration or distribution.

The financial accounting staff prepare the apportionment of departmental costs and post the apportionments to the general ledger in compliance with MoI guidelines. A summary of apportioned production related expenses broken down by classification and by originating workshop should be given to the costing department quarterly. The costing department should also be given a summary of overheads charged directly to cost centres.

The costing department should enter the apportioned costs on the manufacturing overheads apportionment worksheet and apportion them to cost centres on the basis given in our proposed apportionment worksheet. The apportioned overheads should then be entered in the manufacturing overheads register by cost centre. Overheads charged directly to cost centres should also be entered in the register.

We recommend that the costing department review the method of apportionment from time to time for reasonableness. The table depicting the apportionment of manufacturing overhead can be found on page 62 and in the procedures manual.

Overheads which occur, if any, and which are not included on the attached schedule should be apportioned as decided by the costing department. It is not advisable that any manufacturing overheads paid by CPVs or PCPVs be charged directly to cost centres. Instead, all charges should be made to workshops.

The manufacturing overhead register should be totalled quarterly and agreed with manufacturing overheads per the general ledger and with manufacturing overheads per cost centre costing sheets.

There are currently 35 cost centres in ATF of which 27 are directly involved in manufacturing, 6 are manufacturing overhead cost centres and 2 are non manufacturing overhead cost centres.

As stated elsewhere in this report, we have proposed a reduction in the number of direct manufacturing cost centres from 27 to 8. This proposal is made for the sole purpose of making the absorption costing system more manageable and understandable.

When ATF eventually implements a computerised standard costing system, the analytical power of the computer will mean that any number of cost centres can be used without significant additional clerical effort. At this point therefore the current 27 manufacturing cost centres could well be reinstated. To make this possible, our proposed 8 cost centres have arrived at by the amalgamation of existing cost centres - in no case has the boundary of any existing cost centre been changed.

To accomplish the allocation and apportionment of overhead costs to the proposed 8 cost centres, we have designed a document entitled "Manufacturing Overheads Register" - see section 4.4, page 59 of Volume II. In simple terms, this document analyses into 8 columns all of the manufacturing overhead costs for the period concerned and its total will agree with the total manufacturing overhead costs reported in the financial accounts, thus assisting in the task of integration. It is fairly obvious that the use of this document for analysis into 27 cost centres would be extremely unwieldy and error prone.

We have been requested by UNIDO/Vienna to amend the chart of accounts to incorporate new account codes by cost centre instead of using the manufacturing overheads register, which is essentially for memorandum purposes only. Our choice was governed by the statement in paragraph 3.11 of the MoI Accounting Procedures Manual which states "If it is desired to maintain detailed cost accounting records in which all costs are accumulated by cost centre, th[illegible]uch records should be maintained separately from the financial accounts

Nonetheless, if it was desired to keep such cost records by cost centre within the financial accounting system eg for machinery depreciation this could be done by the addition of two subsidiary digits to the current cost codes. Thus the current code for depreciation of production machinery is 6103-42. This could be amended to 6103-42-XX to accommodate the requested amendment.

On balance. we feel that with ATF's current level of accounting skills and abilities our proposed register is preferable.

iv) Transfer register

This is a register which records all transfers in and out of a cost centre. Transfers are defined as the receipts of material from a store or output from the production process of one cost centre passed on to the next cost centre in the production or a store.

Transfers are measured in kg or linear metres depending on the cost centre. A transfer voucher is issued by a cost centre when it has completed work on a batch and is passing the batch to the next cost centre in the production process. A copy of each transfer voucher issued should be sent to the costing department.

The costing department should post the transfer in the transfer register as a transfer out of the issuing cost centre (credit) and as a transfer into the receiving cost centre (debit). Note that some entries will be one sided in the register eg a transfer in from or out to a store (see materials register).

AWASSA TEXTILE FACTORY
EXPLANATORY NOTES TO MANUFACTURING AND OTHER OVERHEADS APPORTIONMENT WORKSHEET

	Description of Overhead	Methodology of Apportionment	Source(s) of Information
1	Depreciation of machinery	Summary of depreciation of machines used in each cost centre (cc)	Annual depreciation schedule Qtly charge = 1/4 x annual charge
2	Depreciation of building	sq.metres/cc x annual depreciation Total sq.metres of factory building	Same as above
3	Depreciation of tools	Summary of tools used in each cost centre	Annual depreciation schedule Qtly charge - 1/4 x annual charge
4	Repairs and maintenance (R&M)	R&M identifiable with a cost centre, charged directly. Other R&M apportioned to cost centres by value of machinery used in each cost centre.	a) Direct payments by cash payment voucher b) Apportionment of manufacturing overheads worksheet
5	Insurance, interest expense and production workshop	Apportionment to cost centres by value of machinery used in each cost centre.	Annual depreciation schedule
6	Transportation of employees, administration expenses, audit fees and miscellaneous expenses	Apportionment to cost centres by number of employees in each cost centre.	Apportionment of manufacturing overheads worksheet
7	Water treatment chemicals, spare parts and lubricant oil	Identifiable with a cost centre. Charged directly to the cost centre which made the material requisition.	a) Store Issue Voucher Register b) Apportionment of manufacturing overheads worksheet
8	Electricity, water, furnace oil, electrical workshop, steam (boiler) and water department	Apportionment to cost centres by total kilowatt hours used in each cost centre.	Apportionment of manufacturing overheads worksheet
9	Production planning and quality control departments	Apportionment to cost centres by number of employees (direct labour only) in each cost centre.	Apportionment of manufacturing overheads worksheet

On a quarterly basis the transfer register should be totalled by cost centre. Totals should be converted to Birr using the stores department moving average unit cost. The cost centre totals for transfers in and out should be entered on the cost centre costing sheet. It should be noted that not all cost centres will receive transfers in eg :

1) blowing/roving;
2) warping and sizing;
3) finishing pretreatment.

In each of these instances the cost centres receive inputs from stores eg :

1) raw materials - cotton store;
2) yarn store;
3) fabric store.

In these cases a charge for direct material will be recorded on the costing sheet.

Three step by step charts of the integration of the financial accounting system with the absorption costing system are shown below. The charts are laid out in columns showing activity and the action to be taken by each of financial accounting, cost accounting, cost centres and material stores. Activities are grouped under :

i) daily routines;

ii) quarterly routines;

iii) management reporting.

INTEGRATED COSTING SYSTEM

ACTIVITY	ACTION TAKEN BY			
A) DAILY ROUTINE	**FINANCIAL ACCOUNTING (FA)**	**COST ACCOUNTING (CA)**	**MANUFACTURING COST CENTRES (CC)**	**MATERIALS STORES (ST)**
1) System Implementation	. GL Stock Accounts reconciled to physical stock counts . All adjustments made . Changes to chart of accounts made . Changes to flow or content of FA or CA posting information made	. Set up registers & OH allocation worksheet . Set up costing sheets & unit cost calculations	. Count WIP and reconcile with GL . Set up logs to monitor transfer vouchers machine hours production output batches	. Count raw material (RM) & finished goods (FG) stock . Reconcile with GL
2) Materials Received	. Post GRN's received from stores: Dr Raw materials Cr Liabilities	. No action	. No action	. Complete GRN's . Copy to FA
3) Materials Issued to Cost Centres	. Post SIV's received from stores: Dr Direct materials CC Cr Raw materials	. Post SIV's received from stores to material registers by CC	. Enter receipt of material per SIV from stores in batch log	. Complete SIV's . Copy to FA . Copy to CA . Copy to CC
4) Monthly Payroll	. Post payroll to GL Copy to CA. Dr Direct labour CC Indirect labour CC Employee benefits CC Cr Liabilities	. Post payroll to labour register by CC . Split by direct & indirect labour and employee benefits	Ensure machine hours and production output logged for use in allocating labour & OH in unit cost calculation	. No action
5) Manufacturing Overheads (OH)	. Post CPV's, PCPV's to GL . Prepare workshop allocations and post to GL Copy to CA	. Enter OH on OH allocation worksheet and complete . Post allocated OH to Mfg OH register by CC	. Ensure machine hours and production output logged for use in allocating labour & OH in unit cost calculation	. No action
6) Transfers between CC's	. No action	. Post transfer register by CC from transfer vouchers	. Prepare transfer vouchers . Copy to next CC or ST . Copy to CA	. No action

INTEGRATED COSTING SYSTEM

ACTIVITY	ACTION TAKEN BY			
B) QUARTERLY ROUTINE	**FINANCIAL ACCOUNTING (FA)**	**COST ACCOUNTING (CA)**	**MANUFACTURING COST CENTRES (CC)**	**MATERIALS STORES (ST)**
7) Movement of FG to FG Store	. Post finished goods summary to GL Dr Finished Goods Cr Finished Goods Contra Account . Use previous quarter derived unit costs	. Post transfer register for transfer of FG from last CC to FG store	. Last CC transfers production output to finished goods store . Use transfer voucher . Copy to CA	. Complete FG GRN's . Complete FG summary . Copy to FA
8) Costing Sheets & Unit Costs	. Reconcile GL to CA registers	. Summarise all registers . Reconcile totals to GL . Post totals to CC costing sheets . Calculate unit costs for next quarter use	. Summarise all logs . Copy to CA	. No action
9) Cost of Goods Sold (CoGS)	. Post CoGS to GL Dr CoGS Cr CoGS Contra Account . Use previous quarter derived unit costs	. No action	. No action	. No action
10) Physical Stock Count	. GL stock accounts reconciled to physical stock counts . GL WIP reconciled to CC costing sheets . All adjustments made	. Reconcile WIP per CC costing sheets to WIP per GL	. Physical count of WIP and reconcile to costing sheet	. Physical count of RM & FG stock . Reconcile with GL

INTEGRATED COSTING SYSTEM

ACTIVITY	ACTION TAKEN BY			
C) MANAGEMENT REPORTING	FINANCIAL ACCOUNTING (FA)	COST ACCOUNTING (CA)	MANUFACTURING COST CENTRES (CC)	MATERIALS STORES (ST)
11) Cost Centre	. Reconcile cost of goods produced (note 14 to Financial Statements) to CA report of CC	. Prepare report by CC and total CCs showing cost of goods produced . Reconcile with FA (note 14)	. No action	. No action
12) Unit Costs	. Update posting routines for FG and CoGS to incorporate new unit costs	. Prepare report showing unit costs by product	. No action	. No action
13) Product Profitability	. Prepare report showing sales - CoGS = profitability by product and for total ATF . Profitability should equal Gross operating surplus on Profit and loss account statement	. No action	. No action	. No action

3.2.6 Timing Considerations

Presently, ATF prepares accounts on a quarterly basis. Therefore, the integrated costing system must be introduced at the beginning of a quarter. Ideally, the quarter beginning 1 January 1994 should be targeted for introduction.

In order to achieve this, it will be necessary for the system as described in this report or with modifications agreed by all parties to be accepted prior to the beginning of the quarter. All ATF employees to be trained in the use of the system must be recruited prior to the beginning of the quarter. They will subsequently assist with its implementation and ultimately be responsible for running it.

In producing notes of explanation of how to complete the various cost sheets we have quoted the physical factors which we use as the basis of allocation of many of the inputs eg machine speeds or, their converse, output per machine hour or minute.

It would be extremely useful if ATF management would arrange to check these factors before our next visit. Their accuracy, whilst not crucial, is important to the basis of our proposed system.

3.2.7 Finance Department Organisation Structure

We reviewed the organisation chart of ATF overall and the finance department in particular. The current organisation charts are attached as figures 3.2.7 i) and 3.2.7 ii).

In June 1993 consultants from Addis Ababa were hired to review the organisation structure of ATF. Their proposed organisation charts for ATF overall and the finance department are attached as figures 3.2.7 iii) and 3.2.7 iv). These proposals have been presented to ATF's Management Board for consideration.

We agree with the recommendation made by the consultants for the overall organisation chart.

We do not agree with the proposed finance department organisation chart for the following reasons :

1) The span of control of the Finance Manager is too broad - nine direct reports (including three secretaries and typists).

2) One on one reporting relationships are proposed eg the Senior Cost Accountant is the only direct report to the Costing and Budget Head.

3) The Budget Clerk should report to the Costing and Budget Head.

4) Payroll Checkers should be part of the Audit Service department which reports to the General Manager.

5) The Cashier should report to the General Accounts Head.

6) Pool typist and secretary should report to the General Accounts Head.

Figure 3.2.7 i

Existing Organisation Chart

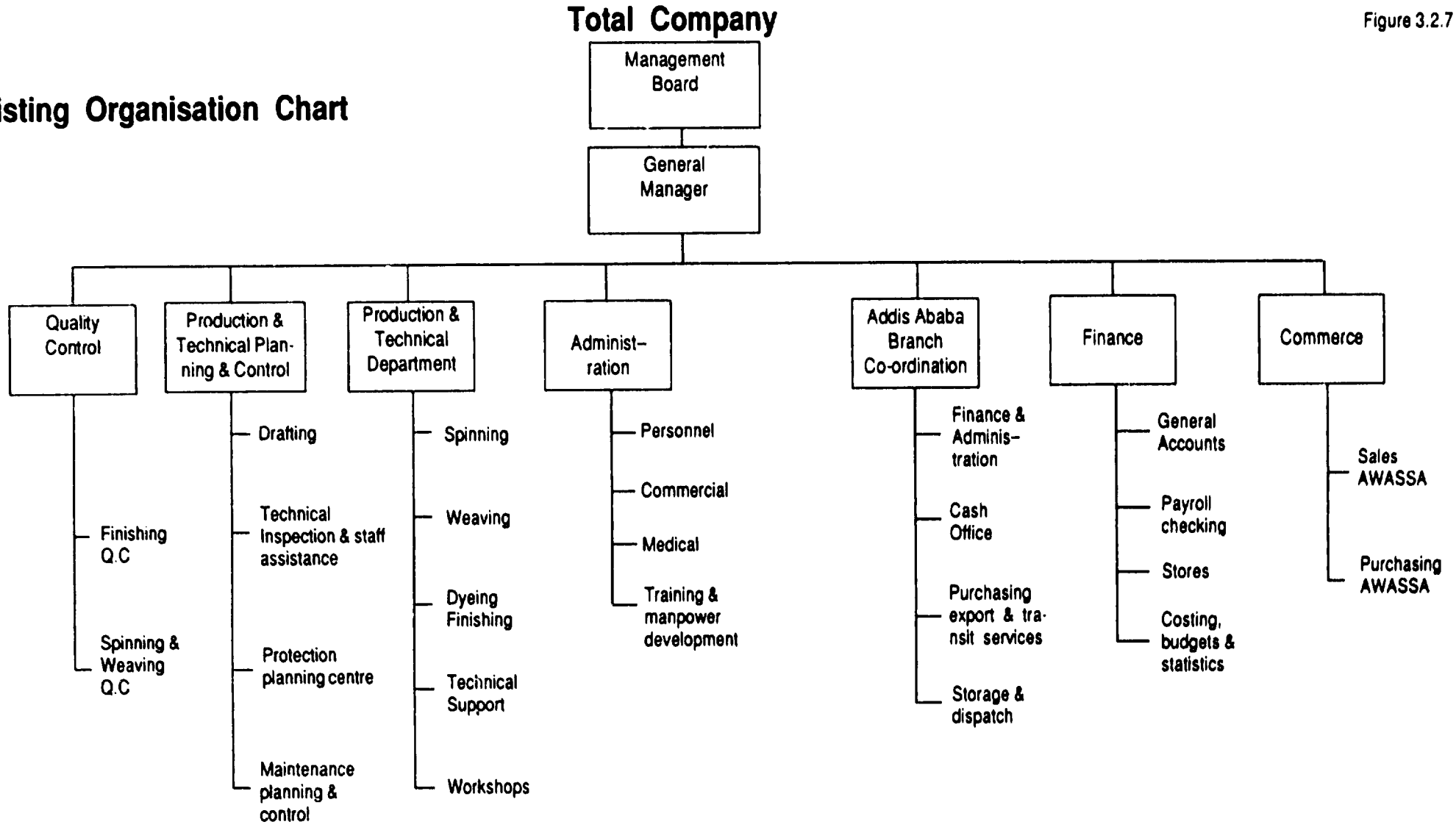


Figure 3.2.7 ii

Existing Organisation Chart

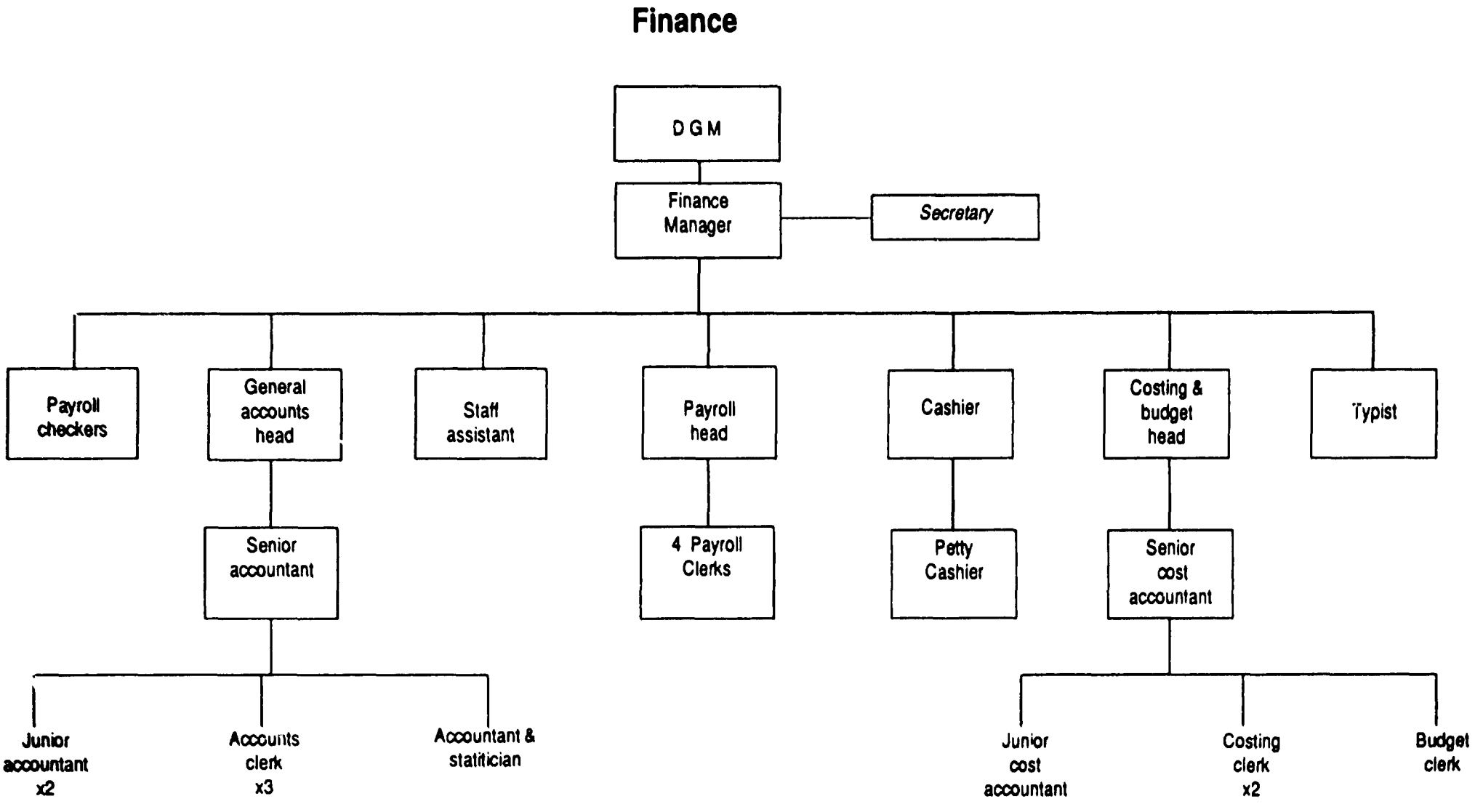


Figure 3.2.7 iii

Proposed Organisation Chart

Total Company

Consultants - Addis Ababa

June 1993

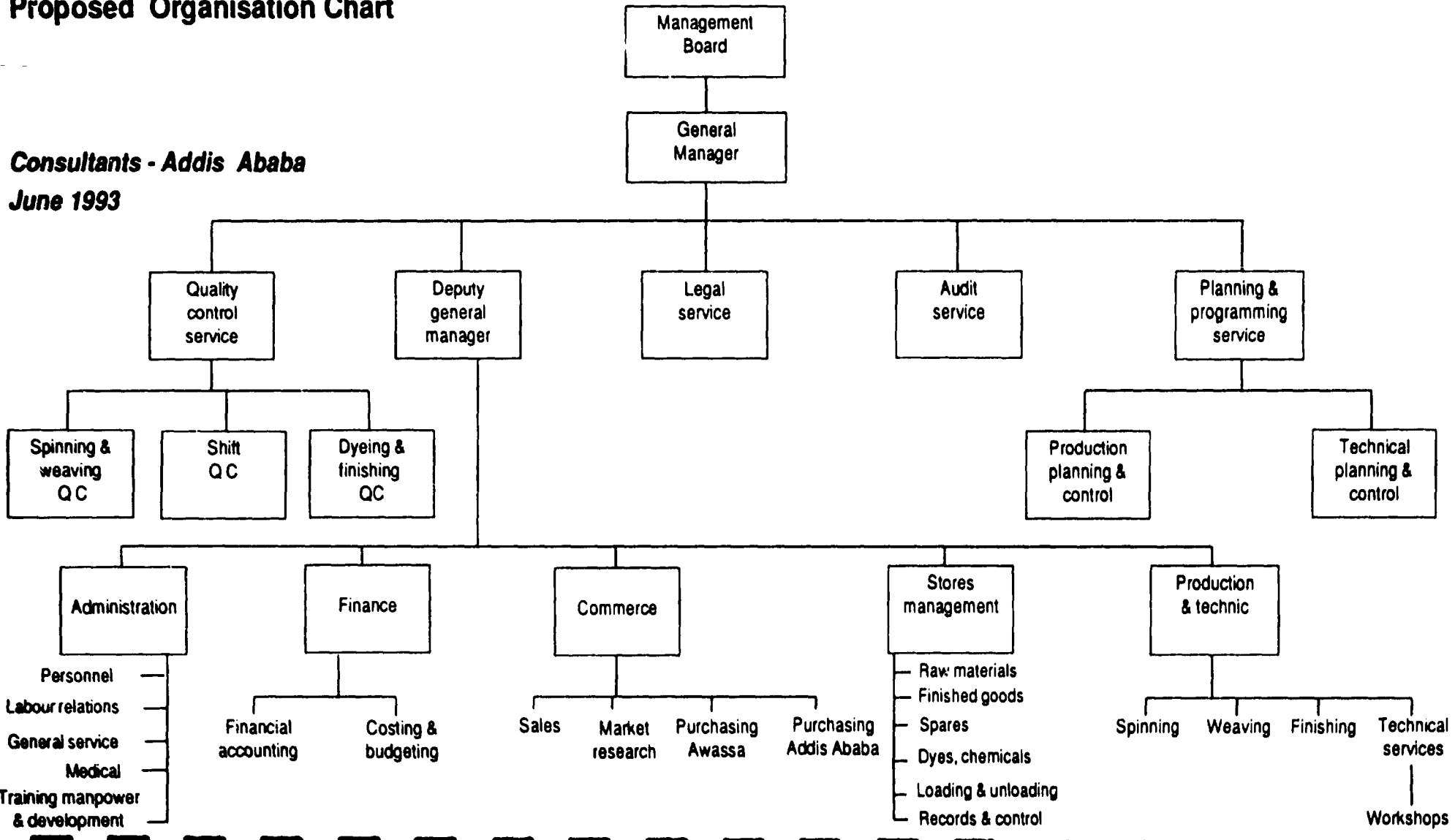


Figure 3.2.7 iv

Proposed Organisation Chart

Consultants - Addis Ababa

June 1993

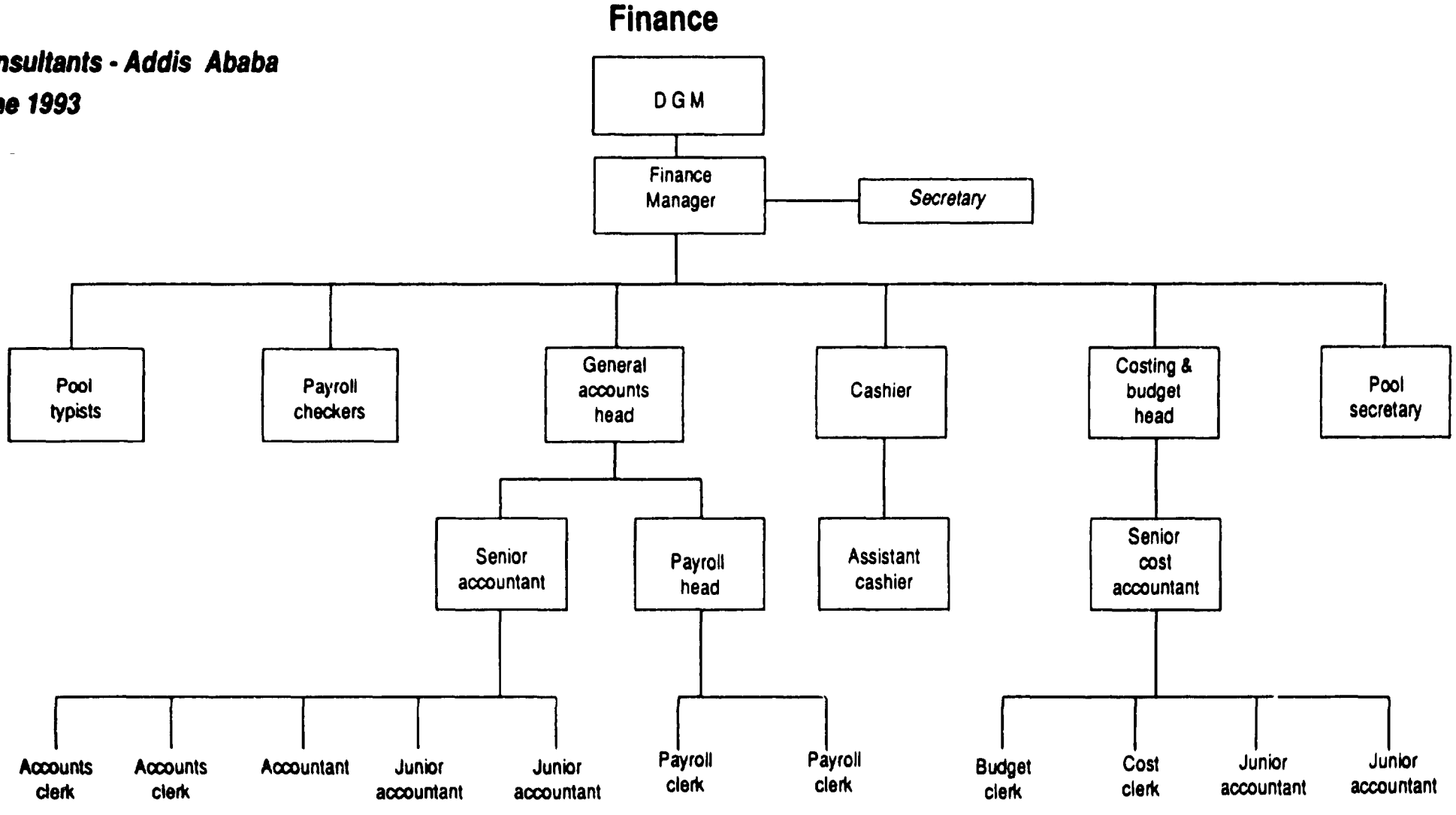
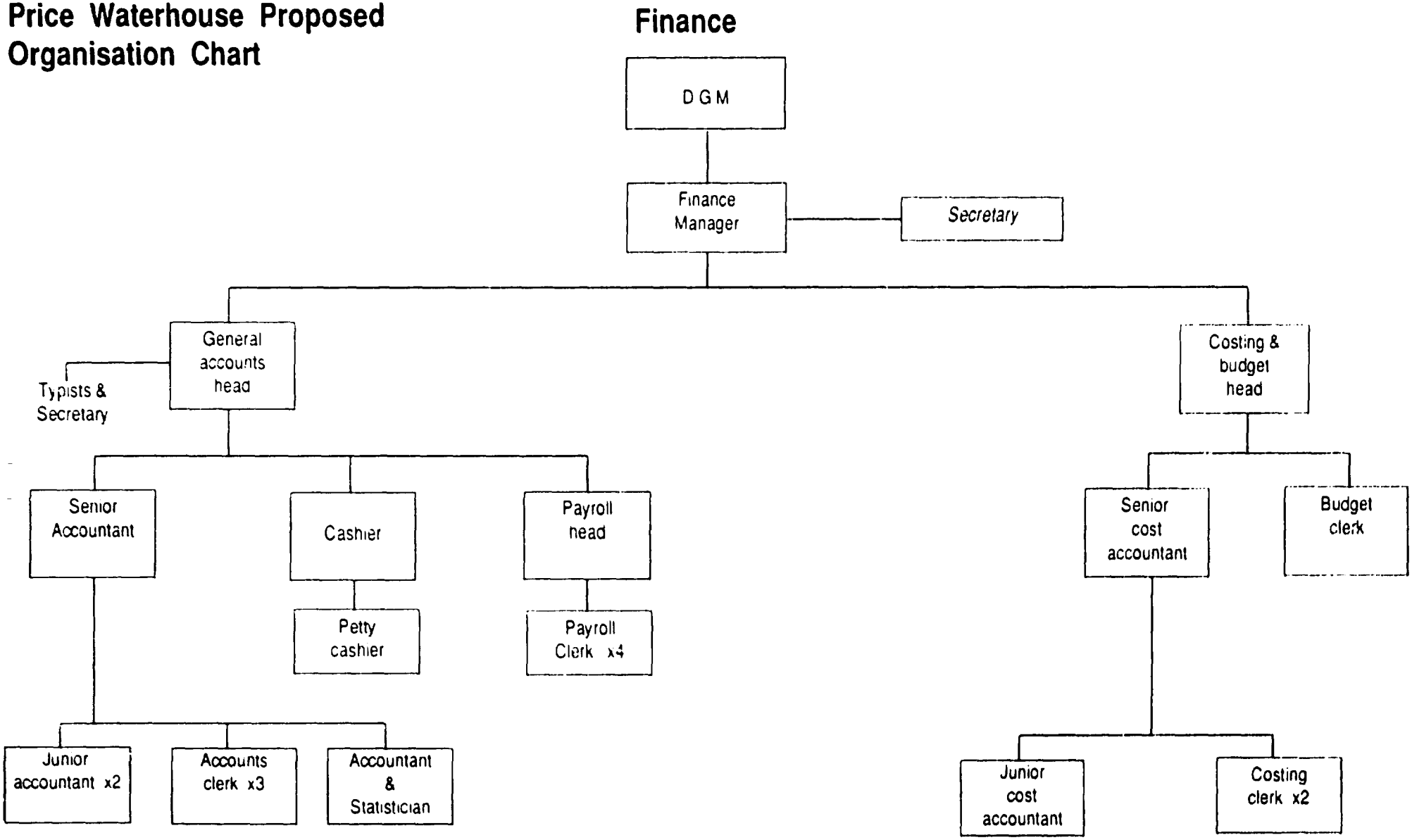


Figure 3.2.7

Price Waterhouse Proposed Organisation Chart



We have attached our proposed organisation chart of the finance department as figure 3.2.7 v).

During our initial visit we also noticed that two senior positions in the finance department were vacant. These positions were :

1) General Accounts Head;

2) Costing and Budget Head.

These positions appear on all the organisation charts whether current, proposed by Addis Ababa consultants or proposed by us. Two current employees have applied for the above positions and in April 1994 we were informed that their applications had been accepted by ATF management and as a result these positions are no longer vacant.

The successful implementation and running of the proposed integrated costing system is highly dependent on capable staff being employed in all key positions.

3.3 USE OF SYSTEM OUTPUT

As mentioned previously there will be two major outputs from this system.

First there will be a report by cost centre indicating its cost performance for the period concerned.

Second there will be a cost statement showing the total cost per unit of each product produced during the relevant period.

These reports should be distributed as follows :

COST REPORT TITLE	RECIPIENT
By Cost Centre	General Manager Deputy General Manager Production Manager Finance Manager Costing and Budget Head Production Planning Head Department Heads (Spinning, Weaving & Finishing) Cost Centre Supervisors
By Product	General Manager Deputy General Manager Production Manager Finance Manager Commercial Manager Costing and Budget Head Production Planning Head

Obviously, there is little point in producing information if this is not made use of to improve ATF's performance.

Our recommendations include the following :

- after production of the reports referred to above, comparisons should be made of unit production costs against those of previous periods; one way of doing this to good effect would be by producing graphs of each cost against time;

- after circulation of the reports (and graphs if produced) a regular cost control meeting should be held. This should be relatively formal with minutes being produced to record actions agreed upon. Relevant actions would include items for which further investigation was required and items where a course of action to reduce costs was fully agreed.

  Those attending would include relevant managers from the production and finance departments

- the reports produced could be used as "pseudo" standard costing reports by recasting them after adjustments for known variances outside the control of management. To use a far fetched example, if all of the workers in a cost centre were prevented from working for an extended period thus reducing output considerably, unit costs of overheads and labour would be high. An adjustment could be made for this factor to eliminate it, thus producing a more "normal" unit cost. Great care should be exercised in using such an approach, it is only too easy to delude one's self!

4 PROCEDURES MANUAL

For ease of distribution and subsequent use the detailed procedures manual has been written and bound as a separate volume - Volume Two.

This manual contains the following :

- definitions of the important cost categories used in the manual and also of some of the accounting policies involved;
- a set of detailed instructions for the procedures to be followed;
- examples of the cost sheets to be completed for each cost centre for each period, together with detailed explanatory notes for their completion. These explanatory notes contain examples and also quote the physical factors of the relevant processes which have been used as the basis for apportionments of the various elements of cost in the cost centres concerned.

5 TRAINING REQUIREMENTS

Training on the integrated costing system will fall into two categories :

1) Internal - provided by Price Waterhouse for selected ATF employees;
2) External - as may be identified for ATF employees.

These two categories are discussed below :

1) Internal training

ATF management were asked to provide a list of names (positions) to be trained. Training will be carried out in two ways internally.

First, there will be a management overview and second there will be on the job training for all staff who will be expected to use the system.

A list of those attending the management overview is attached to this report as Appendix III. The text of the charts presented at this overview is as follows :

Chart 1	Awassa Textile Factory Integrated Absorption Cost Accounting System
Chart 2	**FINANCIAL ACCOUNTING** Total Historical Cost of Running Factory **COST ACCOUNTING** Historical and Projected Product Costs
Chart 3	**ABSORPTION COSTING** All Costs Charged to Output **STANDARD COSTING** **Ideal** or **Standard** Costs Charged to Output Balance Charged as Variance(s)
Chart 4	**INTEGRATED SYSTEM** - Cost Accounting Books of Account Agree with Financial Books of Account - Quarterly ------→ Monthly

Chart 5	**COSTS** - Direct - Indirect **COSTS** - Materials - Labour - Overhead
Chart 6	**COST CENTRES** Blowing/Roving Ring Spinning/Winding Doubling/Twisting Warping/Sizing Weaving Fabric Preparation Dyeing/Printing Packing **AMALGAMATION - NO CHANGE**
Chart 7	**WHERE POSSIBLE - CHARGE DIRECTLY** eg certain materials (grey cloth) **WHERE NOT POSSIBLE - APPORTION** eg certain materials (cotton lint) - labour - overheads
Chart 8	**APPORTIONMENT** Example : Rent **STEP 1 -** Apportion total factory rent to cost centres by area occupied **STEP 2 -** Apportion cost centre rent (plus other overheads) to products by resource consumption eg time spent on machinery
Chart 9	**MATERIALS BALANCE** Opening W-I-P + Deliveries (Transfers in) - Sales (Transfers out) = Closing W-I-P

Chart 10	Reproduction of Cost Sheet for Cost Centre No. 2 - p.40, Volume II
Chart 11	Reproduction of Two Explanatory Tables from Section 4.3.2 - pp.38 & 39, Volume II
Chart 12	Reproduction of Cost Sheet for Cost Centre No. 7(c) - p.58, Volume II
Chart 13	**USE OF SYSTEM OUTPUT** 1. Historical - Cost Centre Performance - Product Unit Cost 2. Forecasting - By Use of Predicted Input Costs
Chart 14	**ATF - COST ACCOUNTING SYSTEM DEVELOPMENT** 1. Introduce Price Waterhouse System as Designed 2. Progress to Monthly Absorption Costing and Financial Accounts 3. Set Labour Standards and Introduce Manual Standard Costing System 4. Computerise Standard Costing System

On the job training will be carried out by all members of the team who will sit with the appropriate members of staff showing them how the various forms, both existing and proposed, interrelate and how they should be completed.

2) External training

It may be necessary for certain ATF employees to receive external training. The two most likely areas would be in cost and management accounting and computer skills.

6 COMPUTERISATION

6.1 INTRODUCTION

The proposed absorption costing system is entirely manual, although the use of Lotus 1-2-3 spreadsheets could make some of the tasks more easy and efficient. Computerisation of costing should only be undertaken after the introduction of a manual standard costing system. We have commented below on the computerisation of the finance department in general.

Because computerisation of financial accounting systems is relatively straightforward there are many existing software packages available. Implementation of such a suite of packages with minimal need for adaptation will provide good training for members of ATF's accounts and computing staff. On the other hand, computerisation of a product costing system frequently needs a large amount of involvement by users in adapting the basic system to meet the needs of the manufacturing processes concerned.

Therefore we advocate that any thought of computerised cost accounting be set aside until the financial accounting systems have been satisfactorily computerised. This recommendation need not necessarily lead to additional delay - implementation of our absorption costing system and its enhancement to a monthly routine could well proceed in parallel with computerisation of the financial accounting systems.

ATF currently has three IBM microcomputers in the production department. They were initially installed in 1988 for control of the textile machinery. They are now used only for processing the payroll and in the production planning department in general.

Maintenance

There is no annual maintenance contract with local dealers for the computers in the Factory. Maintenance is carried-out on a "call out" basis. Currently, frequent breakdowns are experienced that can take as long as three months to repair due to unavailability of spare parts.

An annual maintenance contract gives a priority on repairing the faulty equipment and alternative equipment in the event that it is not repaired on time.

Training

There is no formal information system training offered to the staff in the finance department. Most of the training provided is on-the-job training.

The potential users in the finance department also lack computer awareness and application skills.

Accounting operations within the finance department are manual with the exception of the payroll system.

The objective of this section of the report is to discuss computerisation of :

- all financial applications;
- the costing system.

6.2 INFORMATION SYSTEMS PORTFOLIO

Current and potential financial applications are :

- existing financial applications which include :
  - payroll;
  - debtors ledger;
  - creditors ledger;
  - general ledger;
  - fixed assets;
  - budgeting.

For a detailed review of these current systems see section 2.3

- a standard absorption costing system.

For a detailed review of this system, see section 3.

6.2.1 Software

There is little benefit to be gained from writing accounting software, even if skilled staff are available to do so. There are many modular packages available most of which require little or no regular support because they have a very wide existing user base which has ensured that all parts of the packages will have been thoroughly tested and will thus be bug-free. Some of the advantages from this approach are :

- packages are available now;
- the modular approach means that ATF can implement individual applications in manageable sections and at its own pace;
- possible "hotline" telephone support;
- good documentation likely to be available;
- possibility of recruiting already training staff;
- because of wide user base, ATF can have confidence in its selection.

A possible system which is certainly available in Kenya with a user base and support is TETRA Chameleon.

6.2.2 Hardware

We have assumed that, at least for the foreseeable future, access to data and reports on screens will be required by a maximum of 8 people. The recommended initial configuration would be :

- a small departmental server with a minimum of 320mB hard disc plus 16mB main memory;
- a small to medium sized operating system - SCO UNIX is supported in Kenya and is one of the most widely supported worldwide;
- seven slightly intelligent "terminals" eg Wyse 60. These are available in Kenya and are recommended.

The proposed server will need to be purchased. It is probable that the existing computers could be used as terminals, although some additional operating software may be required.

6.2.3 Implementation Considerations

It is clear that computer awareness and literacy is not well developed at ATF. However, with three computers already owned by the company some start could be made in giving relevant people some training in background skills. It is quite possible that donor funding could be obtained for a suitable training programme. Such training will not, however, produce in the short to medium term a manager who will be capable of selecting and implementing the computer systems which ATF requires. It would be preferable to recruit an Ethiopian with the requisite existing skills. Preferably he should have had direct experience of the implementation of financial packages so that he at least understands the problems which are likely to be experienced.

In other companies senior accountants have acquired computer literacy, specified, purchased, installed and implemented financial management software. However, with the current lack of senior accounting staff at ATF this is not a feasible option at present.

6.3 RECOMMENDATIONS

We do not recommend computerisation of the absorption cost accounting system. Computerisation should only be undertaken when the system is enhanced to a standard costing system.

Certain current manual applications should be replaced by appropriate accounting package software. These applications are :

- general ledger;
- budgeting;
- debtors;
- creditors;
- fixed assets.

These applications can be computerised using off-the-shelf software. Care should be taken that packages selected are locally supported and that implementation assistance and training is available.

7 TRANSITION TO A STANDARD COSTING SYSTEM

7.1 OVERVIEW

We have proposed that ATF implement a manual, absorption cost accounting system. Initially cost accounts will be produced quarterly but as soon as possible the frequency should be increased to monthly. Once this system is running efficiently on a monthly basis and is clearly understood by all involved, ATF should consider advancing to a standard costing system. We have given a brief description of a standard costing system in section 3.1 of this report. The successful implementation of a functioning standard costing system at ATF requires the following to be considered :

- The frequency with which standards should be set.

  The frequency should coincide with the budgetary cycle which is currently annual. In a rapidly changing environment it is sometimes preferable to have a semi-annual cycle. This enables standards to be reset where necessary because either circumstances have changed dramatically or they were incorrectly set in the first place.

- Who is to be responsible for setting standards.

  In general standards should be set as close as possible to the anticipated actual cost for the period concerned. This means that standards should be set by those whose knowledge of price movements, company plans etc best qualifies them to do so. Typically, the following functional heads would be involved in setting standards :

Standard	Functional Responsibility
Selling price Selling volume Selling mix	Marketing/Sales Marketing/Sales Marketing/Sales
Product formulation and design	Marketing/Technical Production
Material usage Labour rate Labour usage	Industrial Engineering/ Technical/Production
Process losses	Production
Material price	Buying/Production.

Although not written in the above table as an involved function it is essential that the finance/cost accounting function is heavily involved with each stage of standard setting. Not only should they understand the requirements better but they are likely to be in possession of, and more conversant with, the historical data which will be used to assist in the standard setting exercise. Notwithstanding the guidance which the cost accounting function will provide to other functions, it is also important that all other functional heads and their relevant subordinates should be given thorough training in standard costing systems in general, and the eventual ATF standard costing system in particular.

We recognise that functional titles given in the table do not necessarily exist per se in ATF - we have used descriptive generic titles for ease of explanation.

7.2 TRANSITION TO STANDARD COSTING

In the sense of a gradual move from an absorption costing to a standard costing system a transition will not be possible. An absorption costing system does not require standards to be set neither does it calculate variances from standard. Both of these activities are fundamental to a proper standard costing system.

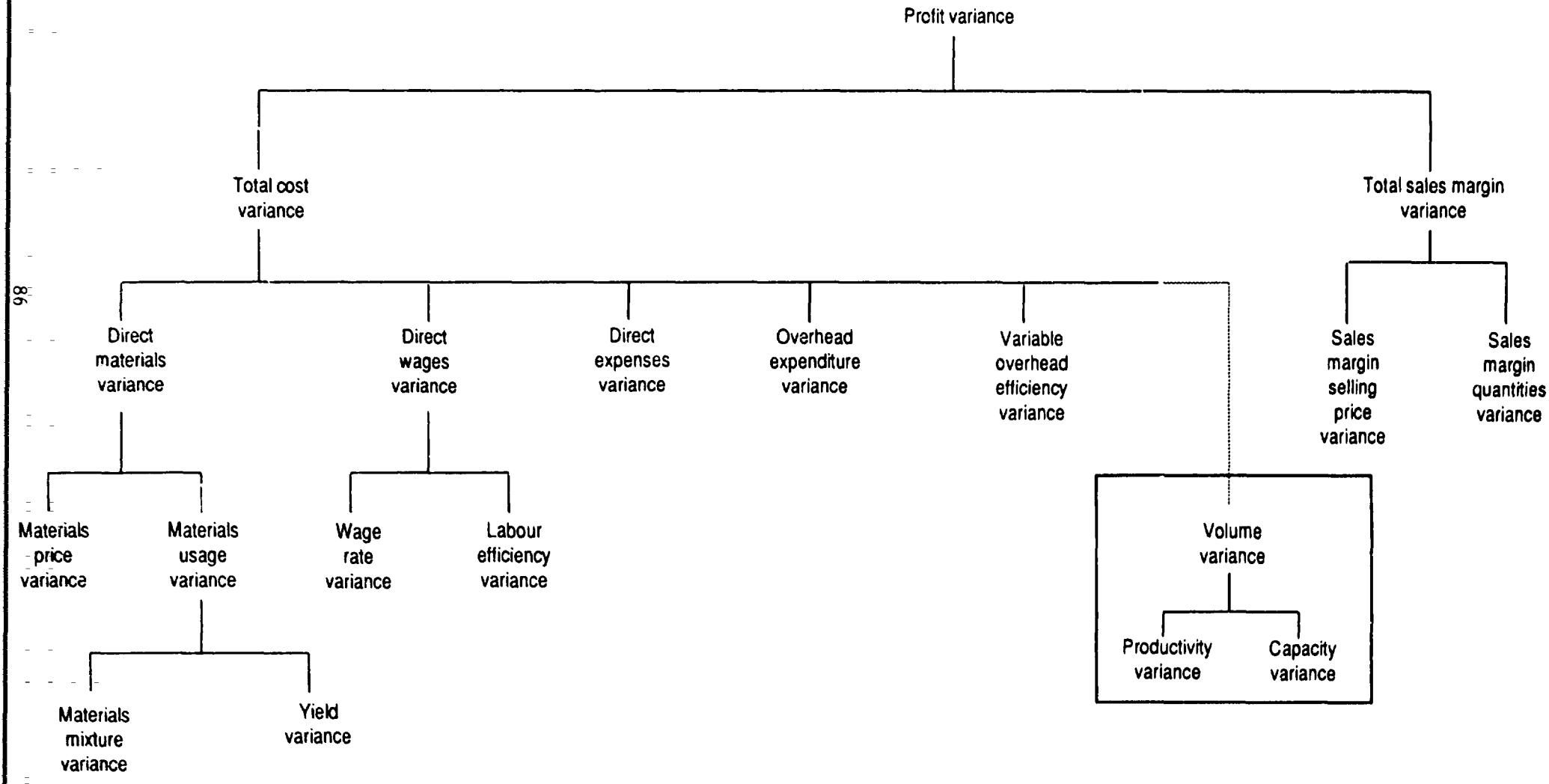
However, in section 3.3. we have made recommendations for the use of the output from our proposed system. In comparing current period output with that for prior periods a very loose form of standard costing is being performed, particularly if the previous periods figures are called "standard". Hence, some of the disciplines necessary for the proper running of a standard costing system are being developed. When a standard costing system is introduced many of the concepts will be familiar to management, even though they may be called by different names.

7.3 VARIANCE ANALYSIS

As mentioned above in Section 7.2. one of the fundamentals of a standard costing system is the ability to measure variances in performance from standard. A powerful extension of this is the ability to analyse reported variances into constituent parts - this technique is called "variance analysis". By analysing variances into their appropriate causes management is provided with a powerful tool with which to diagnose problems and devise appropriate courses of action.

The attached chart depicts some of the most commonly reported variances and their relationship to each other.

COMMON COST VARIANCES



APPENDICES

I Extracts from the Accounts of ATF for the Year Ended 30 June 1993

II Operation Flow Chart

III List of Participants Attending Management Overview System on 19 January 1994

IV List of People Interviewed

V Physical Stock Take Procedures

VI Terms of Reference

VII Original Proposal

EXTRACTS FROM THE ACCOUNTS OF AWASSA TEXTILE FACTORY FOR THE YEAR ENDED 30 JUNE 1993

PROFIT AND LOSS ACCOUNT

	Birr m	Birr m
SALES:		29.98
Cost of goods sold		26.14
Gross operating surplus (loss)		3.84
Other income		2.54
		6.38
EXPENSES:		
Distribution	0.36	
Administration	2.89	
Corporation levy	0.12	
Interest	5.21	
Audit fee	0.02	
Capital charge	-	
Amortization of deferred expenditures	0.53	
Doubtful debts expense	-	
		9.13
Net surplus (loss) before taxation		(2.75)
Provision for taxation		-
Net surplus (loss) after taxation		(2.75)
Transfer to general reserve		(2.75)
Residual surplus		-
Transfer to residual surplus payable		-
		NIL

BALANCE SHEET

		30 June 1993
	Birr m	Birr m
ASSETS EMPLOYED		
Fixed assets		106.12
Deferred expenditures		3.33
CURRENT ASSETS:		
Stock	56.34	
Debtors	11.61	
Associated enterprises	18.51	
Cash & bank balances	1.70	
	88.16	
CURRENT LIABILITIES:		
Creditors	34.06	
Associated enterprises	9.33	
Bank overdraft	4.10	
Provision for taxation	-	
Capital charges payable	0.64	
Residual surplus payable	-	
	48.13	
NET CURRENT ASSETS		40.03
		149.48
FINANCED BY		
State capital		34.02
General reserve		(0.68)
Medium term loan		7.66
Long term loan		108.48
		149.48

Note 1 : Accounting Policies

The principal accounting policies adopted by the factory are stated below.

A) Fixed assets are stated at cost less accumulated depreciation. Depreciation is calculated on a straight line basis at the following rates per annum :

	%
Building	5.0
Plant Machinery	6.7
Motor Vehicles	20.0
Furniture and Equipment	10.0
Small Tools	25.0

B) Finished products and work-in-process are valued on a basis of average cost of production which includes direct and indirect manufacturing expenses incurred at the factory. Valuation of raw and packing materials. spare parts and other store items, the factory uses moving average costs.

C) Sales are stated net of sales tax.

D) Stock Valuation :

Direct and indirect materials are recorded at the moving average cost whereas finished goods are valued at the average production unit cost.

Note 4 : Stock

	30 June 1993 Birr m
Finished products	7.94
Work-in-process	10.42
Raw materials	22.40
Packing materials	0.20
Spare parts & other items	6.78
Goods in transit	8.60
	56.34

Note 13 : Sales

	30 June 1993 Birr m
Main Product	30.20
Sales return	(0.22)
	29.98

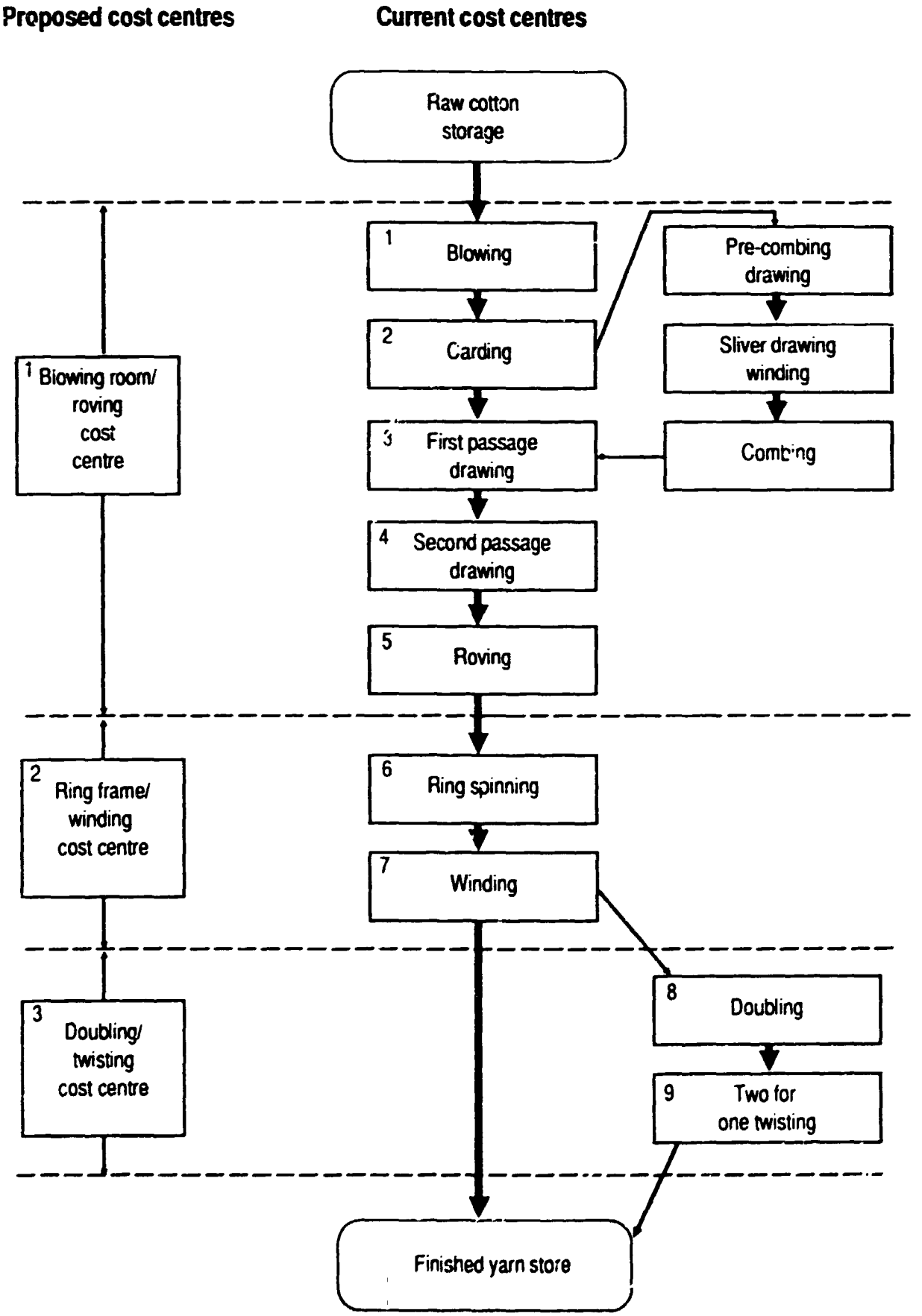
Note 14 : Cost of Goods Sold

	30 June 1993 Birr m
Work-in-Process - beginning	3.35
Direct materials	19.68
Direct labour	0.58
Indirect materials	3.58
Indirect labour	1.86
Employees benefits	0.31
Light, power & water	2.69
Insurance	0.33
Transportation	0.12
Repairs & maintenance	0.20
Depreciation	8.25
Miscellaneous	0.02
	40.97
Less: Work-in-Process - ending	10.42
Cost of goods produced	30.55
Add: Stock of finished goods - beginning	3.53
Less: Stock of finished goods - ending	7.94
Cost of goods sold	26.14

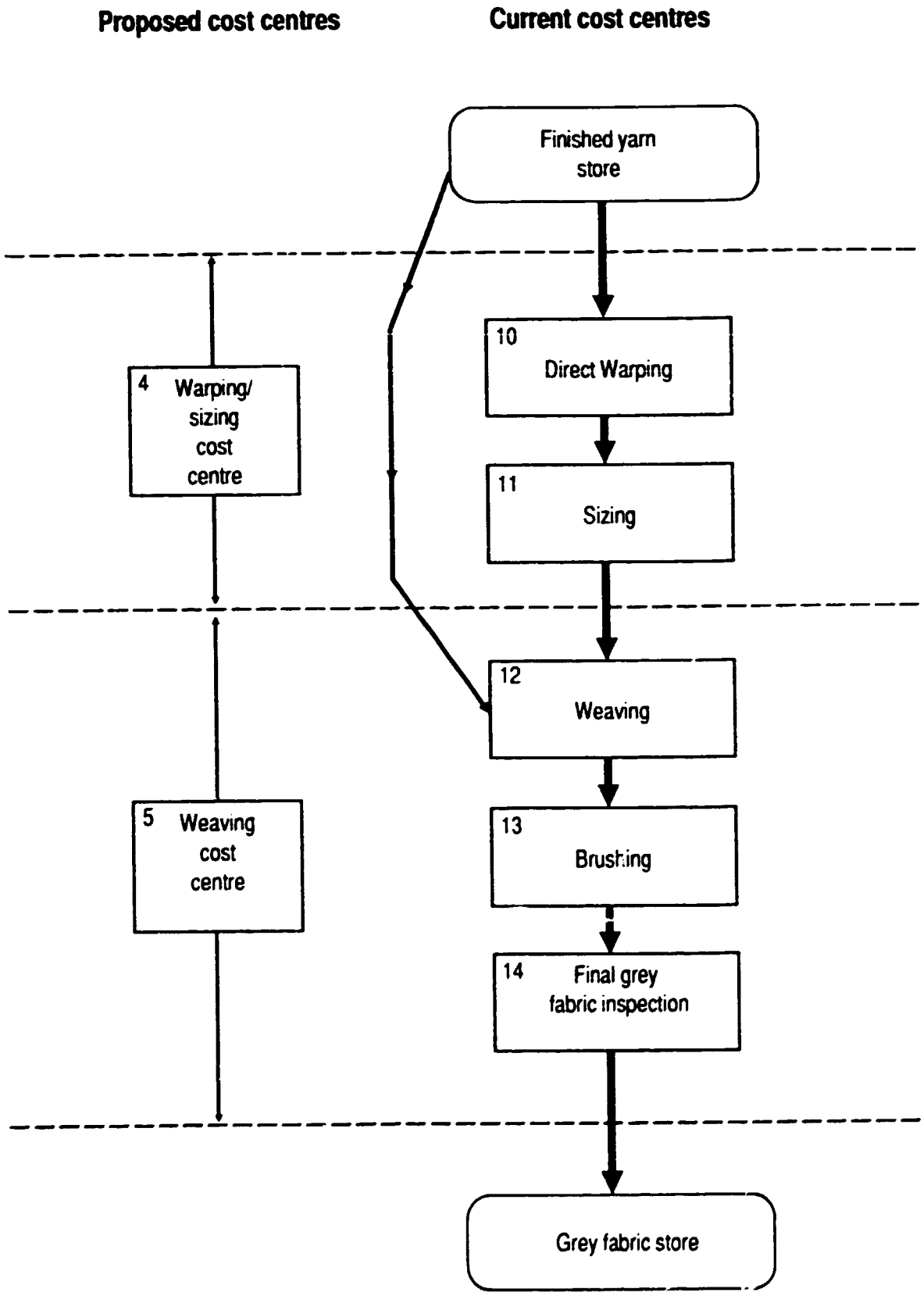
Note 15 : Other Income

	30 June 1993 Birr m
Service income	0.05
By product sales	1.09
Waste sales	0.35
Subsidy	0.52
Equipment rent	0.06
Container, packing wood, plastic drum & others	0.21
Dyeing & printing service	0.26
	2.54

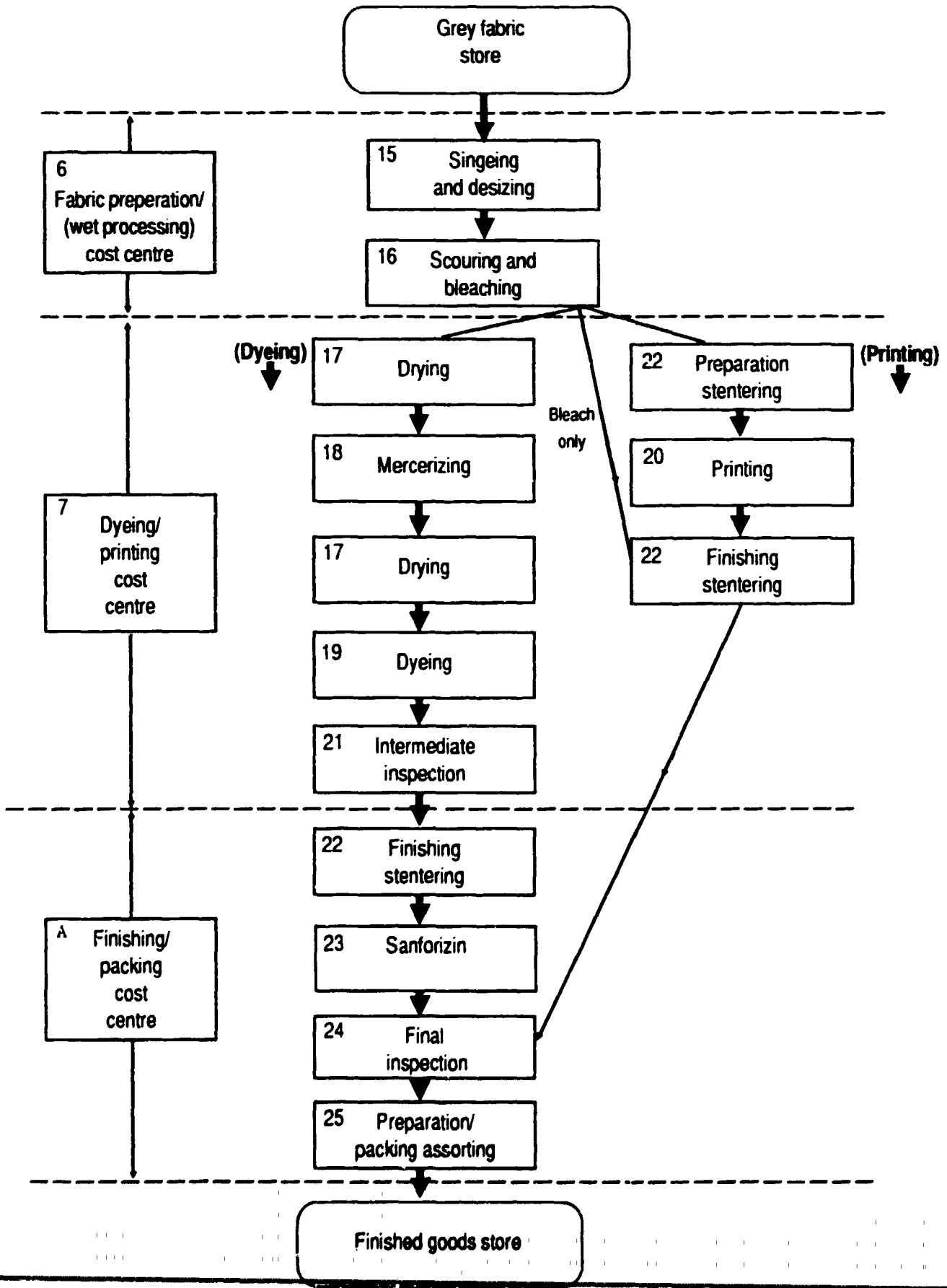
OPERATION FLOW CHART
Spinning department



OPERATION FLOW CHART
Weaving department



OPERATION FLOW CHART
Finishing department



APPENDIX III

AWASSA TEXTILE FACTORY

List of Participants Attending Management Overview of System on 19 January 1994

Participant	Department
Ato Abdulmalik Haji Abubaker	General Manager
Ato Haile Selassie Beyene	Finance
Ato Mechal Brecha	Finance
Ato Solomon Worku	Finance
Ato Eyoh Tesfaye	Finance
Ato Tigistu Tafesse	Finance
W/t Bisrat Temesgen	Finance
W/t Tewabech Teklu	Finance
W/t Amsale Berhanu	Finance
Ato Arega Mitike	Finance
Ato Getu Balew	Finance
Ato Henock Negash	Production
Ato Tamiru G/Tsadik	Production
Ato Getachew Feleke	Production
Ato Mesfin Mekonnen	Production
Ato Gezahagn Tessema	Production
Ato Negash Gurumu	Production Planning
Wro Gena Abdurahman	Production Planning
Wro Fanaye Lemma	Production Planning
Ato Teshome Yimer	Quality Control
Ato Birhane Abebe	Administration
Ato Woldesemayate W/Mariam	Training
Ato Desalegn Gebre	Stores
Wro Atsede Tadesse	Stores

APPENDIX IV

AWASSA TEXTILE FACTORY

List of Interviewees

Interviewee	Department	Position
Ato Abdulmalik Haji Abubaker	General Manager	General Manager
Ato Haile Selassie Beyene	General Manager	Deputy General Manager
Ato Henock Negash	Production	Production Manager
Ato Yasin Geresu	Commerce	Commercial Manager
Ato Negash Gurumu	General Manager	Production Planning Head
Ato Alemayehu Gebru	General Manager	Internal Auditor
Ato Tilahun G/Michael	Administration	Addis Branch Co-ordinator
Ato Solomon Worku	Finance	Senior Accountant
Ato Mechal Brecha	Finance	Staff Assistant
Ato Mulugeta Tekle	Finance	Chief of Stores
Ato Tigistu Taffesse	Finance	Senior Cost Accountant
W/t Bisrat Temesgen	Finance	Budget Clerk
Ato Eyob Tesfaye	Finance	Payroll Master
Ato Mesfin Mekonnen	Production	Spinning Department Head
Ato Tamitu G/Tsadic	Production	Weaving Department Head
Ato Gezahagn Tessema	Production	Finishing Department Head

PHYSICAL STOCK TAKE PROCEDURES

The objectives of taking physical inventories of stock are to ensure that the book balances actually exist and that the stocks are in usable condition.

Before physical inventories are taken, the quantity balances according to the accounts department stock record ledger card must be agreed with the balances on the stores bin cards and all differences identified and adjusted to ensure that the stock record ledger card balances are correct for comparison with the physical counts.

Physical inventory taking must be properly organised and controlled if accurate results are to be obtained. The procedures include :

1) Stock items should be clearly identified as to stock number, description and unit of measure and well arranged in stock number order to facilitate counting.

2) Adequate cut-off procedures must be in force to ensure that purchases, production, stock issues and sales records are completely up dated at the time of the stock taking. Movement of materials during stocktaking must be stopped or most carefully controlled to prevent items being omitted from the count or counted more than once.

3) Stocktaking sheets should be in standard form, pre-numbered and prepared in advance with the stock numbers and descriptions, but not the quantities of the items to be counted. The issue and return of the stocktaking sheets must be controlled by accounting for all numbers, by persons independent of the storekeepers and stock counters.

4) Written instructions, approved by a responsible official, should be issued to all persons concerned with the stocktaking, detailing each person's responsibility and the way in which the stocktaking is to be carried out.

5) Stock should be counted by teams consisting of one person with adequate knowledge (eg a storekeeper) to properly identify the items of stock, one person to make the count (eg a production employee) and a third person to record the results of the count on the stocktaking sheets and check its accuracy by making a recount. Storekeepers should be available to assist, but must not participate in counting items for which they are responsible.

6) Broken, defective or obsolete items must be clearly recorded as such on the stocktaking sheets and identified to management for consideration.

7) Supervisors to whom the stock counters may refer for guidance, should be available during the stocktaking. Supervisors should make test counts and ensure that all items have been counted and the counts recorded.

8) Items counted must be tagged or otherwise marked and a check made that all items have been physically counted and included on the count sheets.

9) Immediately after a section has been completely counted, employees who have had no involvement in either counting or stock record ledger card recording, should enter the quantity balances according to the stock record ledger cards on the count sheets in a separate column.

10) Differences identified should be immediately recounted by persons other than those who performed the original count. Differences still existing between book stock quantities and physical count quantities should be recorded on the stock taking sheets and reported to management.

Direct and Indirect Materials

Management must immediately review all differences to determine those that are within acceptable limits which may be written-off and those that require further investigation. When establishing such parameters consideration must be given to the nature of the stock item and the degree to which it is susceptible to exact determination.

Following management review and approval, the balances on the stock record ledger cards and bin cards will be adjusted to physical quantities by way of journal entries.

After review and approval by management, broken, defective and obsolete items must also be discharged from the stock record ledger cards and bin cards.

Work in Process

It will be necessary for work in process at each cost centre to be physically counted for evaluation and recording in the financial accounts.

Finished Goods

Unlike direct and indirect materials, finished goods will often be capable of exact determination and thus considerably greater attention must be paid to inventory differences as shortages may be due to misappropriation. Shortages and surpluses of similar items are inevitable and may be accepted but significant shortages or surpluses must be thoroughly investigated.

ANNEX E

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

PROJECT IN EHTIOPIA

DP/ETH/89/017

TERMS OF REFERENCE

FOR

ESTABLISHMENT OF AN INTEGRATED PROCESS COST ACCOUNTING SYSTEM

IN A TEXTILE FACTORY

1. Project Title: Establishment of an Integrated Process Cost Accounting System.

2. Background Information:

The Ministry of Industry of the People's Democratic Republic of Ethiopia is the supervising authority of the manufacturing sector, which currently comprises 150 public owned factories organized under ten corporations. The annual turnover of the manufacturing sector under the supervision of the Ministry is Birr 2 Billion (US$ 1 Billion) of which the foreign sales accounts only Birr 135 Million (US$ 62.5 Million). The sector employs 90,000 persons in a nation of about 45 million people.

As can be seen from the limitations stated herein, the manufacturing sector is at its infant stage and needs every assistance to increase employment, foreign exchange earning and wealth creation in the process of the country's economic development.

The National Textiles Corporation (NTC) is the largest corporation under the Ministry with an annual turnover of Birr 460 Million (US$ 230 Millio). the Awassa Textile Factory under NTC is preferred to be the pilot factory to introduce an integrated process cost accounting system. Awassa Textile Factory is a newly established factory which started operation in April 1989. It is located in Awassa, 275 Kms South of Addis Ababa. The factory produces cotton fabrics and has a spinning and weaving capacity of 11.1 million sq. mts. It will employ 1500 people in full capacity operation.

Factories under the supervision of the Ministry of Industry lack an organized cost accounting system to effectively manage their activities.

To rectify this situation, the Ministry has designed a strategy to introduce an integrated process costing system on a pilot basis and adapt the same in other factories with similar processing features.

3. Aim of the Subcontract:

The objective is to design, install and implement an integrated (to be computerized at a later stage) process cost accounting system for the determination of product costs and to effectively control the operation of the pilot factory. Furthermore, a procedures manual, of use to similar factories under the Ministry of Industry, will be prepared for the pilot factory.

4. Scope of Contracting Services:

The Subcontractor inter alia will specifically carry out the following activities:

a) Review the existing organizational structure, nature of processing involved, type of volume of the pilot factory's activities and recommend the most appropriate organizational structure that is suited for the introduction of a process cost accounting system appropriate to the factory;

b) Review existing chart of account with a view to assess its appropriateness for an integrated cost accounting system and recommend changes if desirable in relation to future computerization;

c) Evaluate the existing policies and practices of management control systems and reporting formats that relate to the cost accounting system to be introduced and recommend improvements;

d) Prepare process flow charts for the factory's products along with equivalent co-efficients in each processing unit;

e) Set process cost standards based on products, quality and cost centres;

f) Establish both direct and indirect cost distribution paramaters on yarn count, fabric picks and finishing materials recipe in related processing units for all products that share common facility but require different intensity;

g) Design unit cost computation mechanism suitable for pricing policy for domestic and export markets;

h) Establish norms and standards required for the effective running of the process cost accounting system to be installed;

i) Set product relationship co-efficients on variable cost, contribution margin, overhead costs and net profit basis;

j) Identify cost centre classifications and design reporting formats for each cost centre;

k) Identify variable and fixed costs of the factory;

l) Recommend required equipment for adopting computerized process cost accounting system in the factory, including hardware and software;

m) Prepare systems and procedures manual to be used by the pilot factory and to be adapted to similar factories under the supervision of the Ministry;

n) Indicate the level of qualification practical experience and further training needed to maintain the installed system of the pilot factory;

o) Assess fully the functionality and reliability of the introduced systems by testing them;

p) Provide training necessary for the introduction of the cost accounting scheme, and define further training requirements in financial/accounting area of the enterprise to be undertaken in the future.

5. Reports:

a) Progress Report:

Submit an interim progress report on the status of the project at the end of every two months and at the completion of the system testing stage in 5 copies;

b) Technical Report & Draft Manuals:

Submit a draft final report on the entire project with the proposed system and procedures manual within six months from the date of the signing of the related agreement in 5 copies.

c) Final Technical Report:

Upon revision of the draft report, one month after receiving comments from UNIDO and MOI, submit a final report including any modifications in 10 copies.

6. Qualification: a) The subcontractor shall assign the necessary personnel with qualifications and practical experience commensurate with their assignments .

b) The list should include at least the following:

- one cost accountant
- one financial accountant
- one textile technologist
- systems programmer

The consulting firm will have reputable experience in analyzing production cost structures and in introducing computerized process cost accounting systems in continuous process industries.

They should also have experience in production engineering. if possible in the textile field, and in industrial management. The firm should also have experience in introducing procedure manuals and in training the managers responsible for the introduction of new accountancy or reporting systems.

7. Date Required: As soon as possible

8. Duration: Six months

9. Duty Station: Awassa, Ethiopia

10. Language: English

12. Instruction for Pre-qualification:

Applying firms should submit the following along with their application:

- Name and address of their firm

- Brief history of their firm

- Type of organization and major field of activities

- Number of their professional employees along with their field of specialization

- Membership of their experts in professional associations

- Details of similar activities recently undertaken in developing countries or elsewhere

- Educational level, and work experience of members of the team who are likely to be assigned to the job

- Envisaged work programme showing in man/weeks the staff required on site, at the home office or elsewhere for each of the tasks and activities that make up the project work as a whole

- Financial provisions/remunerations, terms/schedule equipment.

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Price Waterhouse

31 July 1991

United Nations Industrial Development
Organisation (UNIDO)
Chief
Contracts Branch
General Services Division
Department of Administration (DA/GS/CONTR)
PO Box 300
A-1400 Vienna
AUSTRIA

Dear Sir

ESTABLISHMENT OF AN INTEGRATED PROCESS COST ACCOUNTING SYSTEM FOR AWASSA TEXTILE FACTORY, ETHIOPIA - RFP NO P91/54, PROJECT NO DP/ETH/89/017

We are pleased to submit our proposal for undertaking this assignment to develop a process cost accounting system for Awassa Textile Mill. This is being submitted in response to your request for proposal and in accordance with our exchange of telexes regarding submission date.

Prior to preparation of this proposal, I and a Managing Consultant visited Awassa Textile Mill, the National Textile Organisation and the Ministry of Industry in Addis Ababa for four days. This was for the express purpose of discussing this potential assignment with those in the institutions mentioned, and to form our own opinions on any underlying needs, constraints and issues which could have a bearing on the process cost accounting system, and our approach to developing it. The approach and methodology outlined in the attached proposal document therefore reflects our understanding of the situation gained from that "field visit", as well as from the information contained in your request for proposal and terms of reference.

The proposal document, its two annexes and six appendices will we hope provide all of the information you need at this stage. If there are any points which require further clarification would you please communicate with us.

Yours faithfully

Andrew L Baldwin
Partner
Price Waterhouse

ESTABLISHMENT OF AN INTEGRATED PROCESS COST ACCOUNTING SYSTEM FOR AWASSA TEXTILE FACTORY, ETHIOPIA - RFP NO P91/54. PROJECT NO DP/ETH/89/017

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ANNEX 1: Terms of Business

ANNEX 2: Statement of Compliance with UNIDO Guidelines for Submissions

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1 BACKGROUND

1.1 THE TEXTILE INDUSTRY

The Ministry of Industry of the Government of Ethiopia, is the supervising authority of the manufacturing sector. This sector comprises 150 state owned factories organised under 10 parastatal corporations of which one is the National Textile Corporation.

The annual turnover of the manufacturing sector under the Ministry of Industry is equivalent to Birr 2 billion (US$ 1 billion), of which export sales at present are only 6 percent per annum (Birr 135 million) There is therefore very substantial scope for development of exports provided that quality, reliability and pricing can all be made competitive.

The National Textiles Corporations (NTC) is the largest of all the corporations under the Ministry. NTC is responsible for the operations of all textile factories in the country.

1.2 AWASSA TEXTILE MILL

There are seven integrated textile factories operated by NTC, which as already stated is the largest industrial parastatal under the Ministry of Industry. NTC has an annual turnover equivalent to US$ 230 million ie 23% of total industrial production nationally.

Of these textile mills, the Awassa Mill is the largest. It is located in the Sidamo region and employs approximately 1,100 people, but at full capacity this could rise to 1,500 employees. It finishes about 36 million square metres of fabrics per annum (cotton and polyester) and requires approximately 4 million tons of raw cotton. The quality and quantity of the raw cotton obtained is a principal determinant of the production efficiency of the mill.

The three products currently produced by the Awassa mill are twill, poplin and cretonne fabrics. Properly developed there could be ample opportunity for export development given the proviso mentioned in the previous section regarding quality and price.

1.3 OBJECTIVES AND COMMENTS ON TERMS OF REFERENCE

It is our understanding that generally all of the textile factories under the supervision of the Ministry of Industry do not have adequate cost accounting systems to manage their activities effectively. To address this problem the Ministry

has prepared a strategy to introduce process costing systems using the Awassa Mill as a pilot location. Once the costing system has been successfully designed and implemented at this mill the project will be extended. Therefore in developing the costing system at Awassa, the design must be capable of adaptation for introduction into other mills which employ similar processes, even though none are as modern or on the scale of the Awassa mill which only started operation in April 1989.

The overall objective of the assignment is to design and implement a process costing system at the Awassa Textile Mill. It will operate from the same accounting data recorded in the financial accounting systems, and in essence "feed" off the current books and records. It will also require certain non-accounting data, including production statistics, and may require the development of other information that is not currently compiled. The system will be designed to facilitate an easy conversion to computerisation but in our opinion it must first be developed as a manual system.

We have visited the Awassa factory 275Km south of Addis Ababa, and reviewed the existing accounting, costing and management information systems as well as the production planning and production control systems. We have also discussed at length the limitations which the management team is facing with regard to all of these. However, as an integrated textile mill being in a process industry it has relatively straightforward production flow in terms of limited numbers of inputs and finished goods outputs.

At the present time, micro-computers are being used but for very few applications, and the level of computer literacy needs to be raised if the management team is to receive the benefit of actionable management information on a wide range of issues on which effective management decisions will be needed

Therefore, given all of these considerations, and the fact that an integrated process costing system will be quite new for Awassa, we believe that it would be far wiser to develop and implement a manual (or largely manual) process costing system initially. This will enable all concerned to thoroughly understand and to derive optimum benefits from the system, which can then be transferred to the computer, using available packaged software appropriately modified for Awassa.

In support of the primary objective, the assignment requires that procedure manuals be produced for the product costing system introduced at the Awassa Mill. These manuals will need

to be prepared in a format which can be readily adapted to other mills which have similar processing features.

The terms of reference ask for a process cost accounting system based on absorption costing which could be run on the currently available PC's at Awassa. (Terms of Reference Appendix I, Section 4.1) The sub-paragraph which follows that requires recommendation of equipment ie hardware and software, for adopting the process costing system.

There are two important comments which we must make on these clauses within the Terms of Reference (Appendix I). These are:

Comment 1 regarding Absorption Costing:

Although we will as requested develop a system based on absorption costing at this stage, there are very serious limitations to this method. So that, it should in our opinion be regarded as only a temporary measure until such time as cost and production standards can be collected, (or even made available from overseas sources in some cases). At that time, and sooner rather than later the costing system should be adapted to Standard Costing.

The reason for this is that absorption costing does exactly what the name implies, ie it "absorbs" all items of cost including fixed overheads which may be disproportionately large during the start-up years, as well as absorbing any costs caused by inefficiencies. It then allocates or apportions these to the actual level of production. The result quite obviously is that if these items of cost are large compared with norms for the industry, then the final "cost per unit of production" will be inordinately high.

Inevitably, if pricing is based solely on an inward or "introverted" view of cost of production, and there are inefficiencies within the manufacturing operation causing both high fixed overhead costs, and methods causing high variable costs (eg materials, labour, power consumption), then prices charged, or attempted to be charged will be non-competitive.

Within Ethiopia ie the domestic market, given the virtual monopoly which NTC has, or which can be ensured by national price control policies, the market for goods produced will still exist. However this is not in the national interest, and although this unsatisfactory situation can exist there would be little incentive for increasing production efficiency, and reducing costs which would benefit the domestic consumer in Ethiopia.

In the case of the export market where NTC and hence Awassa Textile Factory cannot effect prices and demand, and where price sensitivity exists, the result could be that Ethiopian textile exports are unattractive unless they are subsidised from the public purse. A quite unsatisfactory arrangement all round.

Conversely, and in our opinion ideally, a system of process costing based on Standard Costing principles could, and as soon as the situation permits (ie "standards" can be defined,) should be introduced. In this, Standard Costs will be defined and identified for all key items of cost both variable and fixed, against which " Actual Costs" will be compared as they are incurred.

The Standard Costs therefore will be set at levels which reflect desirable (and realistically achievable, though not necessarily immediately) levels of efficiency, and against which actual costs can be compared.

Standard Process Costing therefore will give the management of Awassa Textile Factory and other factories when implemented there, an excellent measure of efficiency of production. It is a system in fairly wide use internationally, and permits pricing to be set realistically in line with market norms, and identifies areas within the production process where inefficiencies are occurring and which need to be eliminated.

In summary, the advantages of moving from the absorption costing approach which needs to be implemented initially, (in the absence of standards), to a system of Standard Process Costing are as follows:

a Actual performance will be readily compared with pre-determined standards, showing separately the favorable and adverse variances.

b The variances can be analysed in detail, enabling the management of Awassa to investigate the cause. Any inefficiencies in the use of materials, operation of machinery or use of labour will be discovered and can then be corrected.

c The principle of "management by exception" can be applied, so that management can concentrate on important matters needing attention and decision, rather than having to search through and subjectively review a morass of unnecessary information, most of which requires no action at all.

d Gains or losses due to market fluctuations in prices of raw materials ie cotton and polyester, and other inputs, are revealed, as distinct from variations due to manufacturing conversion of those materials into finished textiles or yarns for sale.

e The effects on costs of variations in the volume of production, efficiency of manufacturing equipment usage, price and use of raw materials, the ratio of labour cost to output, and altered expenses are demonstrated at short intervals and can be subjected to management attention and action.

This information will enable management to see whether the factory as a whole, and separate process departments within it are being worked economically, and are producing a satisfactory output. It will further serve as a guide as to whether and how prices can be adjusted to meet competition, especially important if exports are to be increased.

In periods of recession the standard process costing system will show at what price work can be undertaken to secure business sufficient to cover overheads, by incorporating a marginal costing approach within the standard process costing system.

Comment 2 regarding computerisation:

There were at the time of our visit to the Awassa factory very few PC's, and there is a need for extending various other systems in support of both production management (eg production planning and production control systems), as well as general management (eg financial planning, financial accounting, budgeting and budgetary control and other management information systems). These can be regarded as virtually essential for a manufacturing plant of this size and especially in view of its relative importance within the manufacturing sector of Ethiopia.

We suggest therefore that as a matter of some priority, attention should be given to identifying these potential computer applications, and that as a preliminary, a strategic information system plan should be prepared for the Awassa Textile Factory as a whole business. This we believe will be much more effective, and far cheaper in the long run, than taking a piece-meal approach to introduction of information technology into the business.

At the present stage, we are concerned only with the introduction of a process costing system, which should be computer based as soon as possible. Even this however, given other present demands on machine capacity will require additional equipment which we will identify and recommend during the course of our work programme.

Equally if not perhaps more important in the long run, will be the need to develop computer awareness or "computer literacy" as commented earlier, among all key members of the management team, and not simply among day to day operators of the equipment, ie not simply accounting and production control staff and those at comparable levels.

This is a matter of general importance to the Awassa Textile Factory as a whole, and therefore outside the scope of this assignment. It is however of great importance to the overall success of the business.

2 CONSULTANT'S EXPERIENCE AND CAPABILITY

2.1 INTRODUCTION

Price Waterhouse is one of the world's leading professional services firms. It offers audit, accounting, management consultancy, tax and other services to businesses and governments throughout the world. Price Waterhouse staff now number over 44,000 of whom 2,900 are partners. It has over 431 offices operating in 107 countries grouped in national and regional firms.

Price Waterhouse has 27 permanent offices in African countries with over 50 partners and 550 professional staff. From its strategically located offices, Price Waterhouse provides an integrated range of professional advisory services to private sector businesses, parastatals and governments throughout Africa. In the East and Central Africa region management consultancy group there have over 125 resident consultants in five major divisions: Finance, Economics, Information Technology, Human Resource and Manufacturing.

As part of the worldwide Price Waterhouse organisation, we can and do call upon the management consultancy resources of any of our offices. Further details of our capability are provided at Appendix III.

2.2 RELEVANT EXPERIENCE

This study requires a team of consultants with in-depth understanding and previous experience in the areas of organisational review, design of financial and cost accounting systems, information technology and training. Price Waterhouse has demonstrated these required skills and expertise in numerous similar studies carried out in Africa and around the world.

We believe that this assignment demands a particular emphasis on the following key skills:

- the design and implementation of computerised and manual financial and cost accounting systems and other management information systems
- the development of procedure manuals and an integrated user training programme
- experience in the textile industry, and of other process industry from which appropriate ideas can be transferred.

A sample of the projects which we have successfully completed and which are particularly relevant to the specific needs of this assignment are detailed in Appendices IV, V and VI, these summarise our experience in the textile industry, in systems needs of similar situations and in Ethiopia. We believe that they demonstrate our expertise in the particular requirements of this assignment.

3 APPROACH TO COST ACCOUNTING AND IMPLEMENTATION OF SYSTEMS

3.1 INTRODUCTION AND STAGING OF APPROACH

Price Waterhouse attaches great importance to our consultants' obtaining a thorough understanding of our clients businesses. This is particularly significant for cost accounting systems which require a detailed understanding of the production processes, flow of materials and information within the factory. Recommendations which have been developed in close conjunction with our clients, and which are based upon a comprehensive understanding of their needs, will achieve the highest degree of user acceptance and most readily realise the projected benefits.

We believe that a structured approach broken down into distinct stages, each composed of clearly defined steps, is the most effective method of achieving the objective of establishing a fully operational product costing system at Awassa.

The proposed engagement is viewed in five principal stages. These are:

- Familiarisation
- Definition of requirements
- Design of the system
- System implementation, documentation and training
- Operational support, computerisation and post-implementation review.

Stage one - Familiarisation

In order to achieve the overall objectives of the assignment, i.e to develop and assist in implementation of a workable process costing system, we will need to produce a detailed time and work plan, in order to secure a thorough understanding of the Awassa operations, and a review of background information. This will ensure that all important issues are given the consideration which they deserve and that no key issues are missed later.

We will during this familiarisation stage review existing management information both in content and how it is derived and presented. This will include but not be limited to financial, production planning and control systems, quality control and machinery performance information and most forms of appropriate technical reporting.

We will need to conduct interviews with key personnel such as corporate executives, production managers and shop floor supervisors, accountants and others. This will give us the opportunity to assess levels of capability to operate any process costing system, as well as to develop a realistic and comprehensive detailed work plan for executing the engagement.

Stage Two - Definition of Requirements

The consultant team will perform a requirements definition study for the new system. This consists of defining the information (output) that is required by senior management, production managers and accounting staff. The level of detail, accuracy and frequency of reports will be considered. The volume of transactions, number of cost centres and classification of cost elements will also be reviewed.

It will cover all of the principal elements listed in the Terms of Reference (Appendix I).

The study will determine the information (input) and the availability of the data required to produce the periodic reports identified.

The work product will be the Requirements Definition that will be submitted to the top management of the Awassa Textile Factory and representatives of NTC (if that is felt necessary) for approval. The Stage One report will include a prototype for each of the output reports from the process costing system and will identify the input forms or information sources. We will recommend the frequency for the reports and the elapsed time between activity and report production. Major conceptual issues will be addressed in this report. We will include our recommendations for each of these issues, and others that may arise.

Stage three - Design of the system

After securing the approval of "Requirements definition report", the consultant team will perform the detailed system design. This stage will include the following steps.

Step 1: Comparison of the existing cost centre structure to the production manager's responsibilities and the flow of information and process flow. The objective is to align, as closely as possible, the cost centres with the resource consuming activities under the production manager's control.

Step 2: Review of the classification of process costs within the cost centres. Direct costs should be identified as those costs directly associated with the production activities within the cost centre. Direct costs vary in direct proportion with the level of production. Fixed costs do not vary with production level and are normally not within the control of the production managers.

Step 3: Creation of the methodology for allocating direct manufacturing costs (raw materials, direct labour, other direct costs) to "units" of production, given that this is a process manufacturing and therefore "units" are simply quantities produced rather than discrete items. Development of the apportionment techniques for assigning indirect costs to volumes of production. This will allow the costing of goods as they leave each cost centre, whether being transferred to another cost centre or to stores

Step 4: If a standard costing system is to be developed later, the method of establishing standards, the criteria for and timing of revisions, the structure of variances, and the disposition and reporting of variances will need to be established. At the present stage this is outside the terms of reference, since a system based on absorption costing is required. However, if we believe that a standard process costing system could be feasibly introduced now, so skipping the full absorption costing system as an interim measure, we will suggest modification of the assignment.

That would require a review of the existing production planning, production control and budgetary structure as they relate to establishing annual forecasts necessary to establish standards, cost relationships and allocation factors for the standard process costing system

Step 5: Review the existing organisation structure within the finance department in order to determine if and how it will be able to operate the new system. We will consider position responsibilities and the reporting and supervisory relationships

Step 6: Construct data flow diagrams and document flow charts for the principal documents and information to be handled by the system

Step 7: The work product from this stage will be the Stage Two report which will contain the system design and instructions needed for its operation. The flow charts and diagrams will describe the system and allow the management of Awassa Textile Factory and NTC to visualise the cost accounting processes. The report will identify any recommended change to the organisational structure, budgeting procedures, chart of accounts or other matters that may arise during the system design stage.

Step 8: In parallel with much of the work outlined in the "steps" described above, we will be carrying out a search to identify, and as far as possible to appraise, available computer software which meets the needs of a process costing system such as we will have designed, and which could be implemented at Awassa. We do not believe at present that NTC should consider developing a computer based process costing system from first principles if this can possibly be avoided by adoption of suitable packaged software, modified slightly to meet the needs of Awassa and then the other textile factories in Ethiopia presently under NTC. The textile industry in other parts of the world, especially SE Asia and Europe is a mature industry in which literally hundreds of companies have already faced and solved the problem of computerisation of process costing. It should therefore be possible we believe to find available software somewhere which can be used, and which will avoid the unnecessary cost of detailed computer system development and attendant programming costs. The identification of hardware needs will also be carried out virtually concurrently with the software search, simply to ensure compatibility. Therefore the budget for both software and hardware will have been produced so that NTC can order and obtain delivery well before it is needed for preliminary trial running (see stage five) below.

Stage four - Manual System Implementation, Documentation and Training

After approval of the system design document, we will assist in implementation of the system but with very substantial input which must be provided by staff of Awassa Textile Factory. Creating the forms, ledgers, standard reports and other books, documents or records constituting the system. Historical and production information, to the extent it is readily available, will be collected in order to establish the cost allocation factors as appropriate.

User instruction and support documents to the system will be created that contain:

- an **introductory section** that describes the contents and explains how to use it
- **policy statements** that will allow the development of future procedures that are consistent with the initial system design and implementation
- **instructions** for the use of each input form and output report from the system for the initial manual system
- **standard procedures for operation of the process costing system.** The procedures will detail the task to be performed and the purpose of the task. Calculations to be performed and entries to be made in the manual system will be outlined. The instructions will be cross-referenced to completed sample forms to enhance the reader's understanding. The procedures descriptions will identify reconciliations or controls that must be performed to ensure the accuracy of the information
- **training** will be conducted for each of the principle user groups. This will be in the form of brief "workshops" for executive managers, production managers and financial accounting managers with "on the job" training for clerical staff operating the system. The training for system users will concentrate on understanding the concepts of the system and interpreting the reports. The training for systems operators will include going through each step of the system and will incorporate practical examples for the appropriate procedures.

Stage five: Operational support, computerisation and post implementation review

Our consultancy team will assist the Awassa factory staff with guidance on the operation of the manual system for the first two months approximately.

Concurrently with this, but starting slightly later, say at least a month after first introducing the manual system, we will hope to begin the introduction of the computer based system, incorporating such modifications to the software selected as is appropriate. This may need additional services to be provided by the packaged software vendors or others if modifications are considered by us to be extensive. This will mean as commented earlier that those concerned and especially the management of Awassa, will have the opportunity to become familiar with the principles and use of process costing in its basic form ie as a manual system, whilst the computer based system is also being finalised and introduced.

As soon as the computer based system is ready for handover, having been run in parallel with the more basic manual system, then managers will be introduced to this, requiring hopefully only minor additional "training", since the principles will not have changed. Operating staff having been trained during the parallel running phase.

Finally, and at a time to be agreed with the management of the Awassa Textile Factory, and NTC, appropriate members of the consultancy team will return to Awassa to carry out a post implementation review of the system. That review will evaluate its degree of acceptance, any unresolved problems, and the extent to which the system satisfies the needs of the users as identified in "Stage two: Definition of requirements". If new user needs are evident, the review will note them and recommend solutions.

3.2 INVOLVEMENT OF COUNTERPART STAFF AND THIRD PARTIES

As is obvious from the description of the approach to development, and to our assisting in implementation of the systems, this is a fairly ambitious programme which cannot be achieved by outsiders i.e the consulting team, working in isolation. Further, there are very severe budgetary constraints on this assignment imposed under the terms of the UNIDO financial arrangements, and so success must be dependent, and totally dependent on NTC and the Awassa factory in particular, making available adequate qualified counterpart staff to work with the consultants.

This in fact is a caveat which we must apply to this proposal, namely that successful development and implementation must depend upon ample support from all those at Awassa and in NTC concerned.

For example, if we find early on that essential training is needed to increase financial awareness among key persons at Awassa, or that the level of computer literacy is so low that introduction of a computer based process costing system is impossible at this time, then we will not be able within the tight budgetary constraints of this assignment, to provide that training, and alternative source of finance will need to be found for it. The training we will provide will be limited to basic introductory workshops for managers etc involved, assuming that they already have the basic financial awareness to cope with it. Similarly on the job training is all that is envisaged for system operators.

If we find that we are facing such a situation of unacceptable paucity of financial management or computer skills and awareness, we will be able to recommend how this shortfall is remedied. We will not however be able to provide whatever training is needed within the scope of this present assignment.

In terms of software and hardware selection and its acquisition by NTC on behalf of Awassa Textile Factory, we will need to deal with computer software and hardware vendors, and to rely on them to an extent to provide advice initially, adaptation of their software for which they may need to charge NTC as that is outside the scope of the budget if it appears to be fairly extensive, and after sales support for their products. Such arrangements will obviously be between NTC and Awassa Textile Factory and those vendors for whatever support the consultants advise is needed for the future success of the process costing system.

4 DETAILED TECHNICAL METHOD

4.1 OVERVIEW OF THE COST ACCOUNTING OBJECTIVES

In contrast to the routine financial accounting function, cost accounting is not concerned with the overall results of the business but with the efficiency of its various components. Therefore its objective is to provide considerably more detailed information than a financial accounting system. The major distinction between the two systems is revealed in the way that the information is used for decision making. Financial accounting is concerned with how accounting can serve external decision makers such as the Government. Cost accounting is concerned with how the information can serve internal decision makers so that managers within the business can set selling prices, concentrate marketing efforts on profitable products, control costs, assess the performance of its units and evaluate the viability of its individual operations. It is with these considerations in mind that our technical method is devised.

4.2 REVIEW OF EXISTING ORGANISATION STRUCTURE

A complete organisational development study is beyond the scope of this assignment. Therefore we will review the present organisation of the finance department in order to evaluate whether it will be able to support the operation of the process cost accounting system. During this review we will consider how the existing structure needs to be modified so that it will minimise overlapping or conflicting responsibilities between the existing financial accounting function and those responsible for operating the new cost accounting system.

We expect to work closely with senior managers in finance who have an understanding of the capabilities and limitations of their staff. Our team will be drawing upon their experience, particularly on structures, to advise managers. Having developed the recommendations for any changes to the existing structure we will incorporate the views of the local managers.

4.3 MANAGEMENT INFORMATION REQUIREMENTS

The work in this phase of the assignment will focus on ensuring that all relevant managers receive costing information tailored to their specific needs. This will be presented in a format, and integrated with procedures, to ensure that the information assists in decisions which are critical to the profitable running and efficiency of the business.

In order to be successful, costing data needs to be produced in a timely, reliable manner and must be relevant to the needs of management. Our method will be to interview managers to gain an understanding of each individual's role and then assess the key information which is critical to achieving their objectives successfully. Systems generally generate a large volume of data but in our experience there is generally a limited amount of critical information which managers require to assist them to achieve their targets.

Once the content of the information has been defined, our next task will be to design report formats and determine the frequencies with which these reports should be prepared. Interviews from the initial stage will enable the team to provide draft formats to provide a basis of discussion. We have found that this stage can be carried out most efficiently if managers have a suggested format which they can consider and amend to develop the final product.

4.4 ACTIVITY DETAIL

The Terms of Reference (Appendix I, Section 4. Scope of contracting services) summarises the various activities which need to be carried out during the course of this assignment. Several of these have been discussed at some length in Section 3 of this proposal document under "Approach". That section elaborated what we expect or intend to do as the work progresses, and also the depth into which we intend to go. It also clearly defines what we regard as outside this assignment and matters which are the responsibility of others eg NTC, the management of Awassa factory and computer hardware and software suppliers.

In principle, we agree with that list of activities, as modified or described within this proposed document. There is little point therefore in repeating that list already appearing in Appendix I.

5 SCHEDULE OF THE WORK PROGRAMME

We have divided our proposed consulting assignment into major tasks. Our plan for completing the engagement is shown in the workplan of Figure 1.

Figure 1: Schedule of work plan for Awassa process cost accounting system