OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

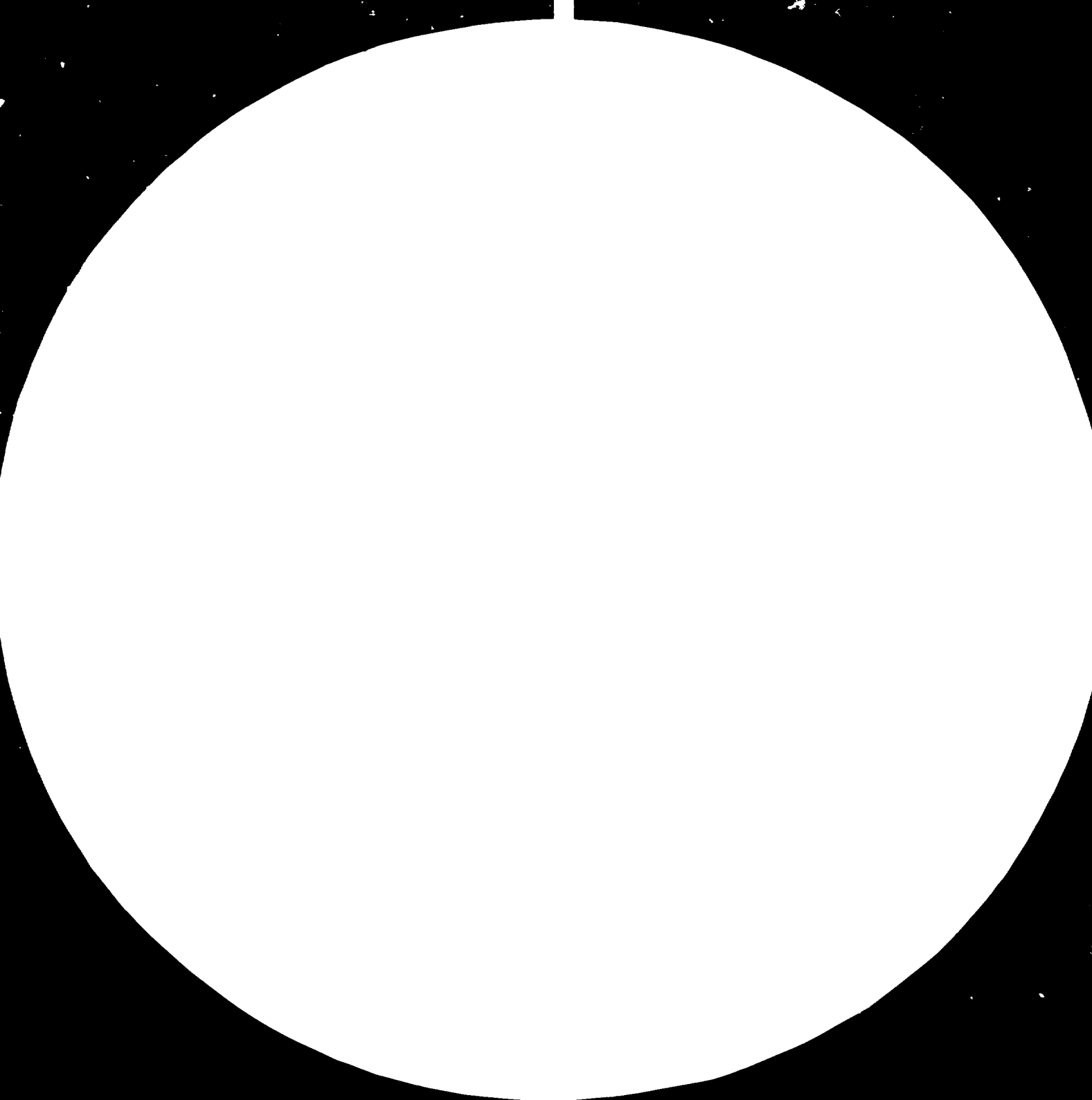
FAIR USE POLICY

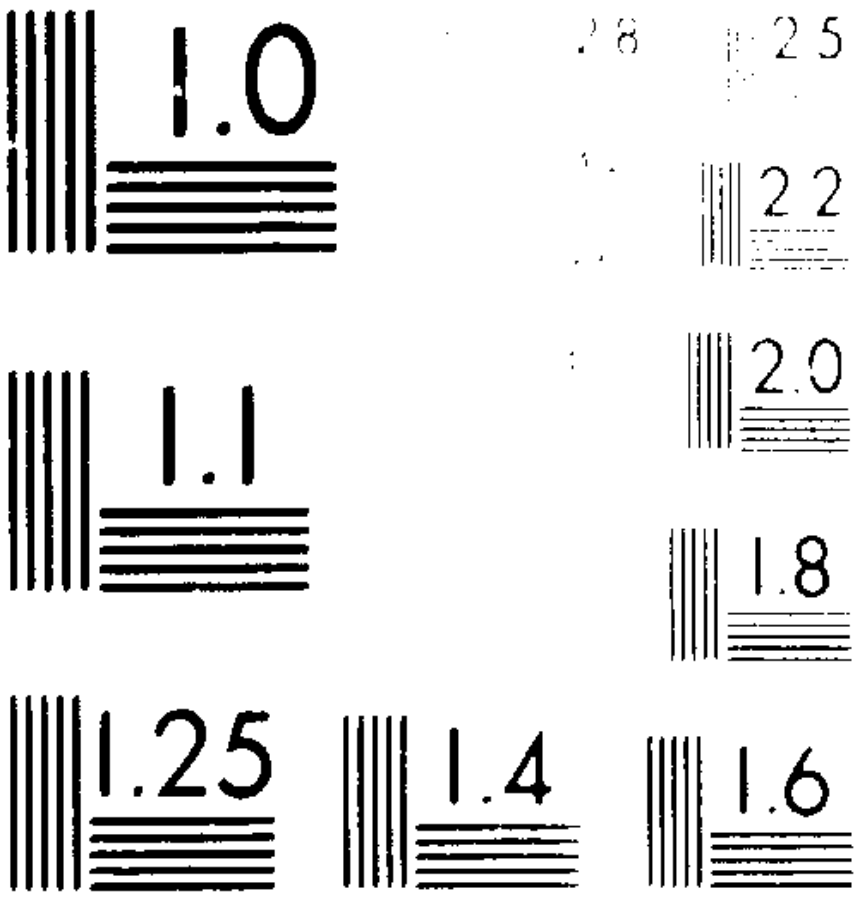
CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5

Kienbaum Entwicklungs-Consult

12122

NMWC Operation manual.

APPENDIX TO THE REPORT

SURVEY OF THE METALWORKING SECTOR IN ETHIOPIA

KIENBAUM ENTWICKLUNGS-CONSULT GMBH

GUMMERSBACH, FEDERAL REPUBLIC OF GERMANY

1981

N M W C - OPERATION MANUAL

1. Organisation Structure
2. Finance Planning
3. Production Planning & Control
4. Maintenance and Repair
5. Departmental Cost Accounting and Control
6. Remuneration

N M W C - OPERATION MANUAL

It is the purpose of an operation manual to

- describe all operations and procedures of the Corporation and the individual NMWC-Plants
- define the basic systems for management and business administration
- provide a general basis for design and application of special systems within individual NMWC-Plants
- define duties, competences and responsibilities of key personnel on all levels.

The objective emphazises the requirement that the Operaion Manual shall be an aid to executive of the Corporation and serve as an aide-mémoire and reference book in cases of doubt as well as to facilitate the induction of new executive.

The contents of the Operation Manual cannot be determined by several departments; this task has rather to be left to one central department which is engaged in planning and organisation functions for the whole Corporation.

The Operation Manual must be subject to the current control of the Planning and Organisation Department. Only such instructions can be adapted which thePlanning and Organisation Department has approved. The provisions laid down in the Manual are binding for all staff members.

If a staff member discovers that the provisions are not or no longer observed, he is held to report this matter through the channel of his supervisor to the Planning and Organisation Department. The competent department manager is bound to enforce the application as prescribed or to develop together with the Planning and Organisation Department any necessary modification.

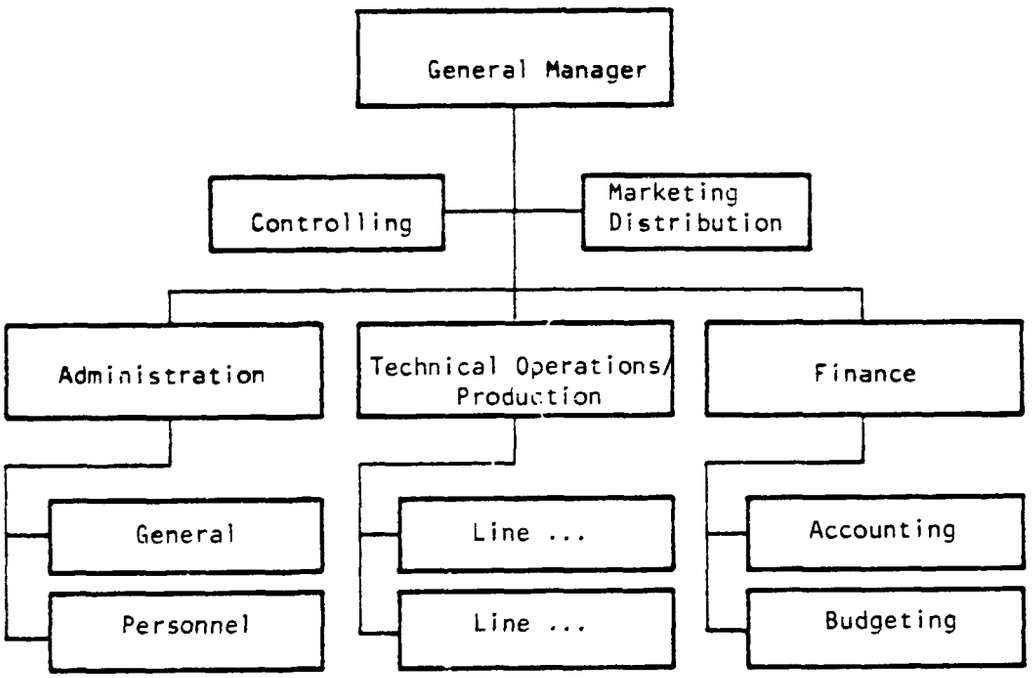
In the following some key elements of the proposed NMWC-Operation Manual are presented.
Their detailed completion should be done in connection with the development and implementation of a NMWC-advisory team.

As pointed out in the main report, this will require the assistance of 2 spezialized expatriate experts over a period of 3 years.

1. ORGANISATION STRUCTURE

1. Organisation Structure

While NMWC-Plants are of relatively moderate size a relatively simple - "classical" - organisational structure is appropriate :



Procurement and Sales Departments are missing in this scheme at plant level as these functions are centralizes in NMWC.

"Marketing and Distribution" should be taken care of by assistants to the General Manager. Their functions should comprise :

- keeping contact to clients
- identifying new ones
- identifying new market/client-requirements
- follow up orders from receipt to delivery to the client
- doing everything to meet the requirements and satisfy of all clients.

The substructures for Administration ("Personnel" and "General") and Finance ("Accounting", "Planning & Budgeting") are practically the same in all plants while the production departments have to be structured according their individual manufacturing lines.

These substructures should be in accordance with the cost-center-system. (see cost accounting and controlling system).

Subdivisions of the Production Department in each plant should be :

- production planning and control
- materials management
- maintenance and repair
- quality control.

As production management is the most essential key function for improvements of performance of the NMWC plants a general job description for a "Director Production" is attached.

OPERATION MANUAL
MANAGEMENT ORGANISATION

JOB DESCRIPTION
DIRECTOR PRODUCTION (MANUFACTURING)

Objectives and Scope of the Job

The Director Production (Manufacturing) serves the company in two ways:

- as member of the Board of Directors contributing to the long-term increase of output, profitability and competitive position of the Corporation;

- as head of the production (manufacturing) departments being responsible for

  timely and economic supply of the company with goods (materials of all kinds) and services in conformity with the requirements;

  economic, timely and qualitatively sound production and manufacture of products.

OPERATION MANUAL
MANAGEMENT ORGANISATION

JOB DESCRIPTION
DIRECTOR PRODUCTION (MANUFACTURING)

Functions and Responsibilities in the Board of Directors

Responsibilities Towards the Corporation as a Whole

The Director Production (Manufacturing) formulates the company's production, manufacturing and purchasing policies subject to the approval of the Managing Director and the Board of Commissaries.

In particular, he is responsible for maintaining the company's production, manufacturing and purchasing function in the Corporation, i.e., for the economic manufacture of products in the required quality ard at the right time to meet sales requirements and for keeping within the budget. This function includes also materials management. Thus the responsibility covers also the economically optimum balance between market requirements as to time and quantity on the one hand, and the requirement of low-cost procurement, production, and stock keeping on the other.

Together with the other members of the Board of Directors he is responsible for the company as a whole.
He will understand his tasks and responsibilities not only as head of the production, manufacturing and purchasing departments but also in the light of the overall corporate objective.
Supporting general company policies he helps to maintain and increase the efficiency and competitive position of the company by assuring a constant flow of mutual information, and he works towards an optimum cooperation within the Corporation.

He supports the other members of the Board in all matters of production, manufacturing and purchasing and helps them to solve any specific problems in their various departments.

He keeps himself constantly informed on the development of costs and performance in all units and departments and will take appropriate action as to reduce costs and increase performance. He is responsible for setting up plans and budgets in due time and for preparing reports and information to other directors.

Cooperation with other Directors

The Director Production (Manufacturing) will collaborate with other directors as to:

- determining company policy,
- important decisions in the operating process of the company,
- corporate planning,
- organisation,
- coordination,
- control,
- representation of interest.

Cooperation with Director Marketing:

- In determining the production programme and in product design in order to give due consideration to market trends and market requirements;
- in preparing technical literature (folders and leaflets, brochures, catalogues, operating and maintenance instructions, newspaper articles, etc.) and technical arguments for sales purposes;
- in technical problems affecting the marketing function which result from complaints and technical modifications;
- in sales planning in order to give due consideration to capacity potentials in production;

- in planning the production programme by giving due consideration to market requirements and economic finished products storage;
- to schedule delivery dates in the case of major offers and contracts;
- to determine actions to be taken when capacity bottlenecks or idle capacity are identifiable.

Cooperation with Director Finances and Control:

- Determination of production programme and product development considering cost/performance ratio;
- planning of developments, investment, production, manufacturing and procurement within the overall corporate planning;
- identification as to return on investment;
- development of cost/performance ratio in the production (manufacturing) units and departments;
- specific problems of taxes and insurance arising in the production (manufacturing) units and departments.

Cooperation with Director Personnel and Administration:

- Corporate planning;
- all personnel and administrative problems of importance concerning the production (manufacturing) units and departments;
- in hiring, transfers and dismissals of employees, close cooperation with the Director Personnel and Administration should be assured, and an attempt should be made to arrive at joint decisions. If such joint decision can not be reached, the matter will have to be decided upon by the Managing Director.

Participation in Internal Conferences

- Weekly management conference serving as coordinating and decision-making body to solve problems concerning company strategies and important operations.

  Participants:
  Managing Director,
  Director Marketing,
  Director Production (Manufacturing),
  Director Finances and Control,
  Director Personnel and Administration,
  Executive staff for part-time consultation on specific problems,
  Secretary, if necessary.

- Other management conferences.

- Quarterly conferences on the situation and development of the company.

  Participants:
  all members of the Board of Directors,
  all managers directly under the control of directors.

- Quarterly conferences with Commissaries.

OPERATION MANUAL
MANAGEMENT ORGANISATION

JOB DESCRIPTION
DIRECTOR PRODUCTION (MANUFACTURING)

Functions and Responsibilities in the Production (Manufacturing) Units and Departments

The Director Production (Manufacturing) is accountable for all activities and performance of his staff as well as for all work performed in his units and departments as to quality, quantity, time and costs. This results in the risk and responsibility to plan and control operations under the aspects of transparency and optimum profitability.

To assure optimum effectiveness within the units and departments the Director will carefully delegate tasks, responsibilities and authority to qualified staff members.

Accepting the responsibilities of leadership, he will guide and control his subordinates and motivate them by setting attainable goals.

Being fully responsible for his units and departments he will set an example to his subordinates by maintaining the discipline he has to enforce in his units and departments in order to ensure constant and smooth performance.

Since objectives of management and staff are not always compatible, decisions have to be made and carried out even if they create human conflicts.

Personnel

- Decisive cooperation in selecting, hiring, financial classification, promoting and dismissal of management personnel in the units and departments;
- assuring thorough job acquaintance of new employees;
- assistance to employees in participating in training and development programmes within or outside the company;
- scheduling vacations and arranging for substitution of employees on vacation or sick-leave according to the working situation.

Organisation

- Constant improvement of the management, functional and material organisation in the units and departments;
- determination of authority and responsibilities of subordinate staff members;
- constant improvement and control of the discipline to make the organisation work;
- attention to orderliness and cleanliness in the units and departments.

Information

- Collecting internal and outside information relevant for own scope of duties;
- evaluating and applying information as to planning, decision-making and control;
- keeping other directors informed on relevant developments and occurrences in the production (manufacturing) units and departments, in particular when capacity bottlenecks or idle capacity loom up;
- informing unit and department executives in regular meetings of present goals and objectives.

1. Preparation of Decisions

- Preparing decisions as to the determination of goals, principles and standards of work in the units and departments;
- preparing decisions to solve problems regarding the units and departments.

Professional Tasks

Materials Management

- Observation of the raw material market,
- assuring the utilization of efficient supply sources,
- analysis of price trends,
- determining quantity of purchase and negotiating contract,
- negotiating contracts for scrap sales,
- assistance in essential purchasing negotiations and contract awards including investments,
- initiating measures to remove supply bottlenecks,
- supervision of economic storage.

Production Technology and Plant Layout

- Determination of objectives for process development and for development of equipment and follow-up,
- taking action when difficulties or defective developments occur,
- setting objectives for time and motion studies and follow-up.

Production Control

- Setting the objective for planning the production programme,
- studying the results of production programme planning to detect bottlenecks or free capacity at an early date and to assure their optimalisation under market, storage and production aspects,
- setting priorities of orders in bottleneck situations in agreement with marketing.

Production

- Observation of the entire production process in the production units with the aim of due implementation of the production programme with respect to quantity, dates and quality,
- intervening in special difficulties as to due dates or quality,
- observing the development of costs and performance and stimulating rationalisation measures,
- assuring that company regulations and legal provisions and in particular accident prevention rules are being observed,
- intervening in extraordinary events (such as accidents, supply difficulties).

Quality Control

- Setting objectives for the development of control methods, testing standards and inspection specifications as well as follow-up,
- evaluation of quality control results and of complaint analyses and stimulating measures for the maintenance of quality standards and/or for quality improvement.

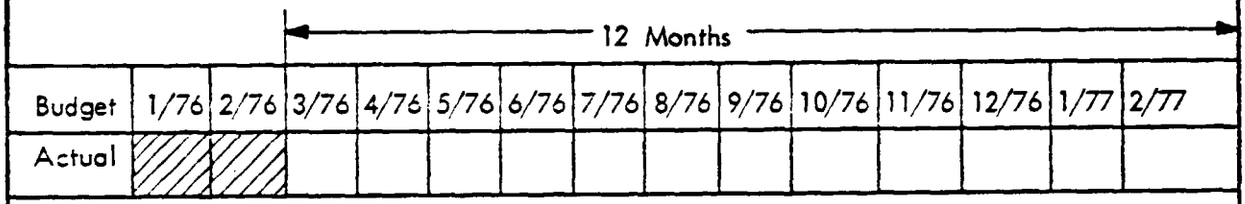
2. FINANCE PLANNING

Task and Objective

The annual financial plan is the true purpose of "rolling financial planning". If at all possible it shall be based on the corporate plan covering several years.

The annual financial plan is to be divided into monthly plans and should be established as rolling budget ("overlapping plan"), whereby the new month is added to the expired month which has been audited by financial control so that the annual financial plan covers always a period of 12 months.

ROLLING BUDGET



Medium-term planning corresponds to operative planning which reflects operations and actions in the various areas.

It is the purpose of the annual financial plan and its monthly or quarterly sub-plans to forecast the liquidity development in the period concerned. The expected receipts and expenses of the period have to be compiled on the basis of liquid funds in hand.

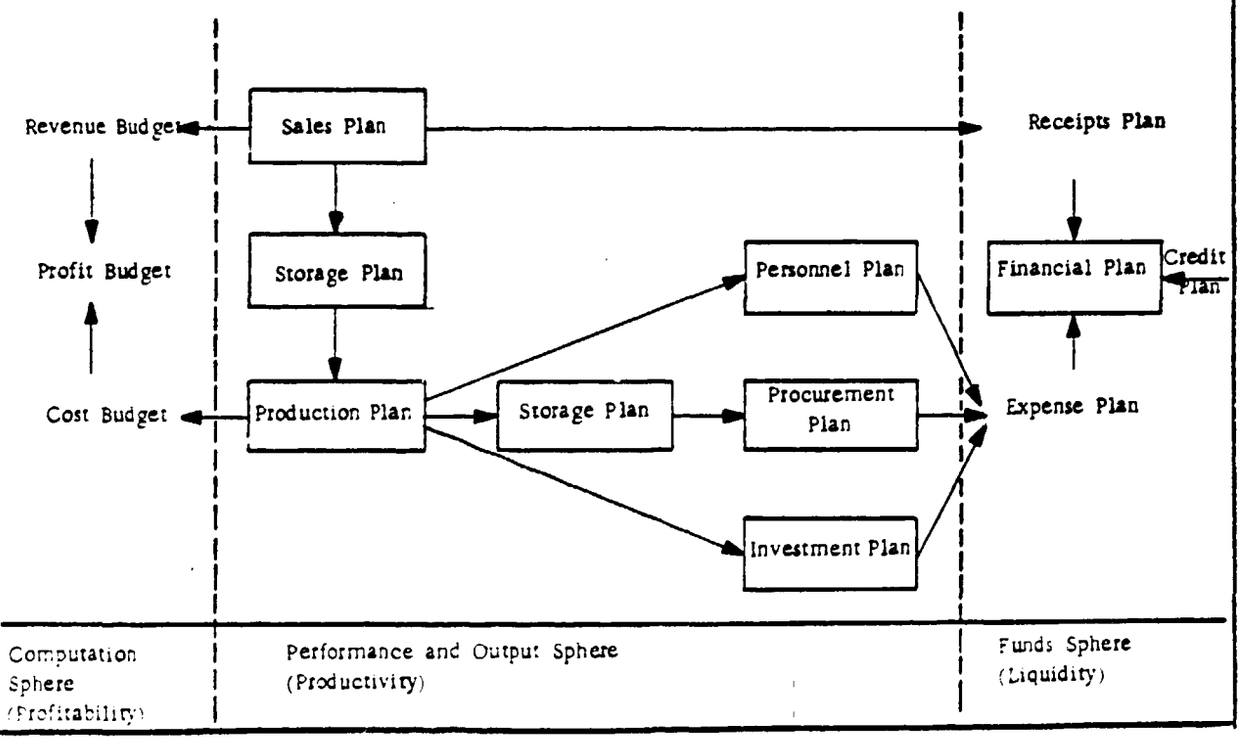
Basic Principles and Relationships

The sales plan reflecting the general objective for the business volume is the tarting point. Apart from the interjected storage plan for finished products the sales plan affects the production plan which gives rise to comprehensive planning activities in the field of programming and execution.

The production plan gives impulses to personnel planning as well as to the procurement and investment plan. The storage plan is interposed between the production plan and the procurement plan for raw materials and supplies in order to build up a buffer of stocks.

Procurement and investment plan on the expense side and sales plan on the receipt side, supplemented by extraordinary expenses and receipts, join the financial plan which serves to supervise and assure liquidity.

Relationships of Operational Sub-Plans



On the other hand, typical cost-oriented budgets are

- sales budget,
- production budget,
- overhead budget.

Naturally part of the cost and expenditure-oriented budgets are at the same time basis of expense planning because many expenditures have an expense effect. On the other hand budgets for depreciation, valuation reserves, reserves, etc. are irrelevant to financial planning.

Thus exact budgeting of all areas of the Corporation can serve as basis of both profit planning and financial planning.

In establishing the financial plan it is useful to subdivide this plan into an ordinary and an extraordinary financial plan. The ordinary financial plan covers receipts and expenses resulting from the sales activity whereas the extraordinary one shows the financial movements resulting from active or passive financial measures (for instance, on the receipt side: borrowings, receipts from the sale of capital equipment; on the expense side: pay-back of loans, capital investments).

Ordinary expense planning is based on the expenditure plan and/or budget. Vital items in this respect are:

- direct order-related sales expenses including subcontracting, transportation, erection, commissions, etc.,
- sales costs,
- production costs broken down by material costs, cost of labour and overhead as far as they affect expenses,
- other running charges such as current taxes, maintenance, interest, insurance, rentals, etc.

Relevant factors in planning extraordinary expenses are investments in buildings and machinery and equipment as well as financing measures (granting of loans, pay-back of credits).

Financial planning for the entire BBI Corporation which is done at the Head Office is based on the preceding sub-plans for the individual units. Individual budgets are established on the basis of the various programmes and operation plans which are analyzed as to their financial effectiveness and which then become the basis of receipts and expenses in the financial plan.

Budgets which are based on financial movements are in particular

- material procurement plan,
- investment plan.

Procedure

Individual budgets are established as follows:

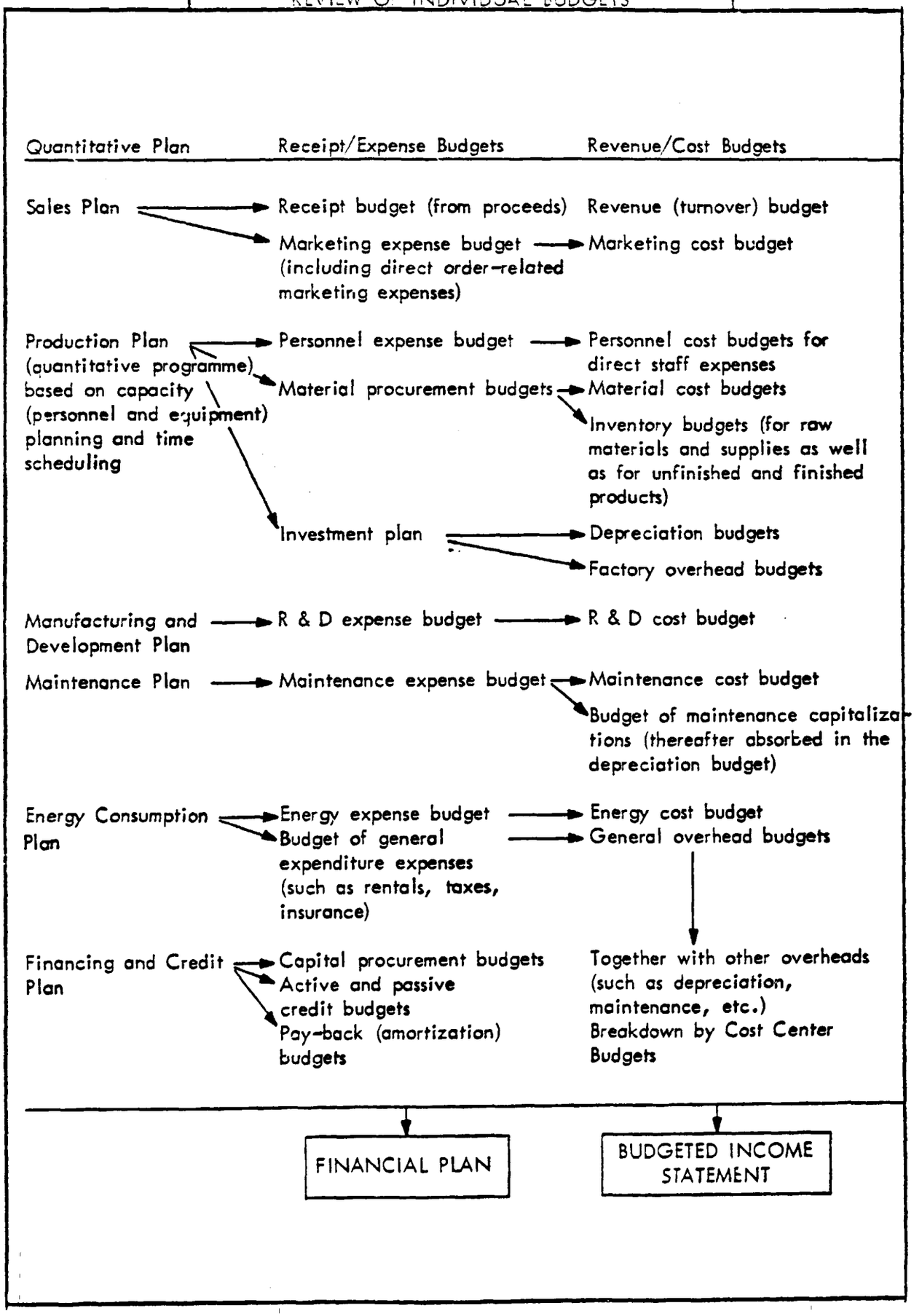
Budgets of receipts and expenses which are generally concentrated in major items are developed from the quantitative plans. They include in the first instance all proceeds and/or revenues affecting receipts and all expenditures affecting expenses. In addition, all reductions of real assets accounts which are to be regarded as asset exchange (such as alienations of capital assets or working assets as far as they are not affecting results) and such increases in the left-hand side from owned and outside capital are added to the receipts side which lead to an increase in cash on hand. On the expense side those items are considered which lead to increases in assets or else to reductions in liabilities, such as investments in tangible assets and financial fixed assets, stock increases in raw materials and supplies as well as in unfinished and finished products and/or pay-back of credits and loans, proprietary capital and profit distribution and the like.

From the receipt and expense budgets which are established in global items the individual cost and performance budgets are to be developed on the basis of refined programming. In this operation the receipts and expenses having a stock character are eliminated and the income-effective items are budgeted in cost accounting by cost centers and cost-incurring products as overhead.

The development of budgets by cost centers is particularly suited to enhance the cost responsibility of individual areas and thus to control not only the income development but also the financial trend.

OPERATION MANUAL
MANAGEMENT ORGANISATION

FINANCIAL PLANNING
REVIEW OF INDIVIDUAL BUDGETS



3. PRODUCTION PLANNING & CONTROL

MATERIALS MANAGEMENT

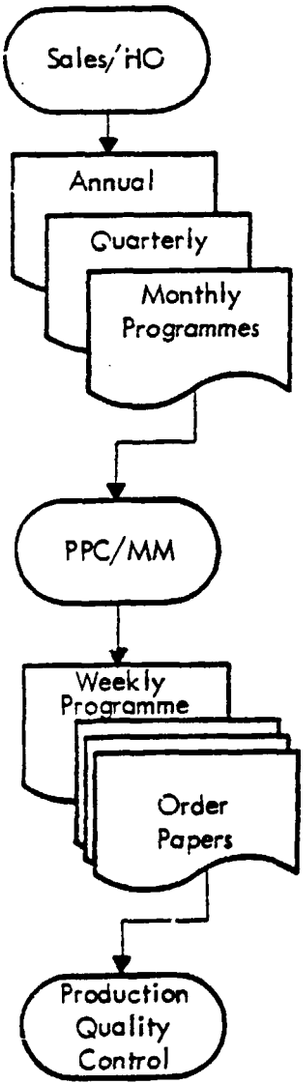
3. Production Planning and Control
Materials Management

The following scheme including diagrammes and flow sheets gives a general outline and concept of an integrated production planning and control/materials management system. For practical and individual application details have to elaborated and implemented for

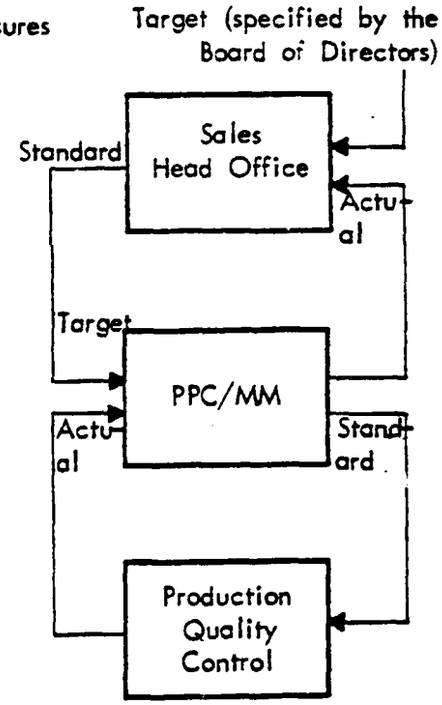
- classified numeric system
- machinery documentations
- products documentations
- parts lists
- manufacturing/cost-center definitions
- planning systems for inputs, manufacturing facilities, manpower
- spare parts planning/manufacturing/procurement
- inventory control system
- quality control system

As Job-Order Manufacture, as it is performed e.g. by Kaliti Steel requires some special features a specific outline and flow sheet is provided for job-order-production of steel structures and plate work, as typical examples.

1 Functional Relationships



Production Planning and Control and Materials Management (PPC/MM) fulfill the intermediary function between Sales and its marketing desires on the one hand and Production as well as Quality Control and their capacity potentials with regard to manpower, machinery and equipment on the other. PPC/MM convert the marketing desires of Sales which are presented in the form of annual, quarterly and monthly programmes, into weekly programmes and orders which can be read by Production and Quality Control, as shown in the graph on the left-hand side. In addition to planning and controlling capacity, i.e., balancing in due time and by appropriate measures available capacity and potential capacity requirements, PPC/MM have to provide the required quantity and quality of material at the required time and place.

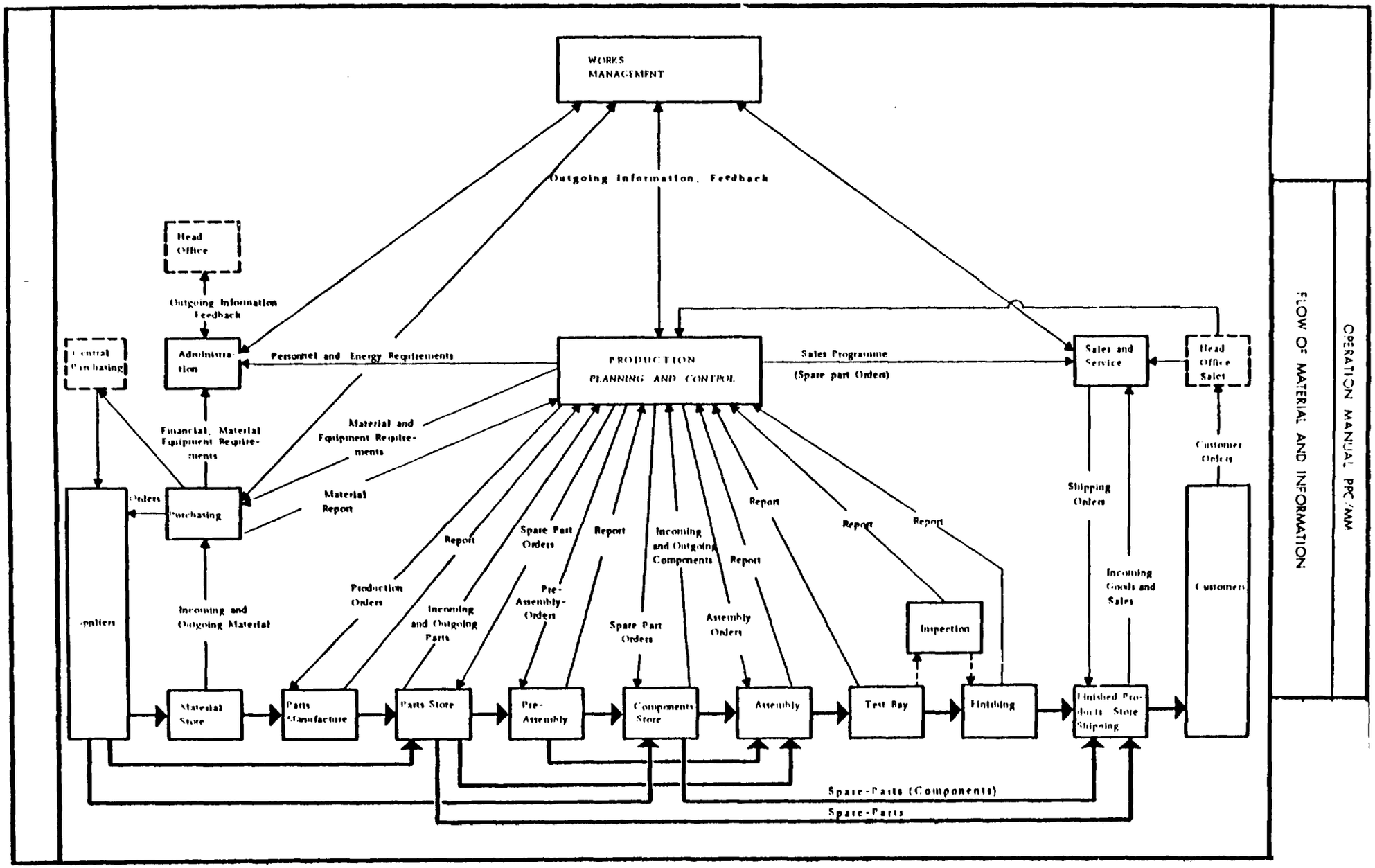


These functional relationships are best explained by a feedback system as shown in the graph on the right-hand side. The production process is based on targets set by PPC/MM in the form of weekly programmes, shop orders and material reservation. The results of production are currently controlled by follow-up of manufacturing orders and planned times (time keeping) in order to take action in due course when deviations from production targets emerge, by such short-term measures as providing additional material, rearrangements, temporary

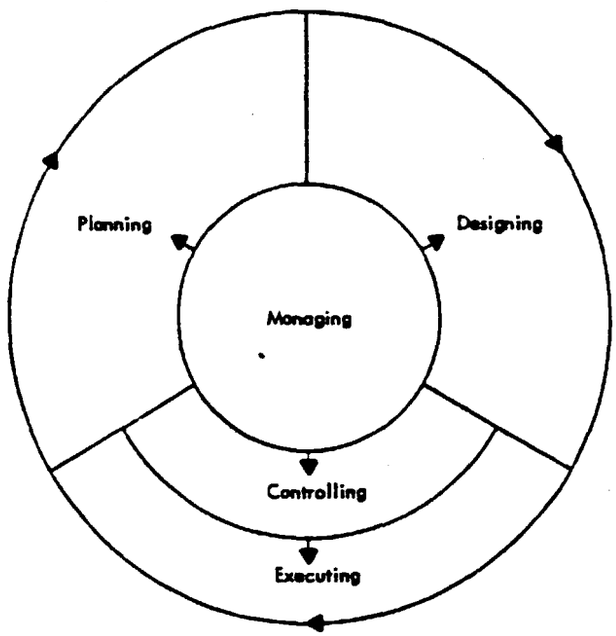
capacity adjustment, increase or decrease in number of units of subsequent work orders, etc. or by such medium or long-term control measures as increase/decrease of planned allowances for waste and rework, initiating the expansion or shutdown of capacity, moving up or postponing parts of the quarterly programme and the like in cases of emerging essential deviations which cannot be avoided by short-term actions. The latter will result in any case in a feedback to Sales, for instance, in the form of a programme review which in turn may result in considerable changes in targets specified by Sales. For example, the initial period of new types may be shortened and full production may be started earlier than originally planned.

Such targets which are specified by Sales to PPC/MM are always checked by Production Planning as to capacity and dates. This means that in the planning stage the lower part of the control loop operates only hypothetically: it is assumed that capacities as loaded will yield the same results as in the past, and material deliveries are planned accordingly; in determining material requirements a certain percentage is assumed for waste, cuttings, shrinkage, etc. The production process is started and controlled by Production Control only when plans have reached an adequate level of reality.

The functional relationships between PPC/MM and other departments and units of the Corporation are illustrated in the flow sheet on the following Appendix 1.2-1, Flow of Material and Information.


WORKS MANAGEMENT
Outgoing Information, Feedback
Head Office
Outgoing Information Feedback
Central Purchasing
Administration
Personnel and Energy Requirements
PRODUCTION PLANNING AND CONTROL
Sales Programme
(Spare part Orders)
Sales and Service
Head Office Sales
Financial, Material Equipment Requirements
Material and Equipment Requirements
Material Report
Orders
Purchasing
Customer Orders
Shipping Orders
Report
Spare Part Orders
Incoming and Outgoing Components
Production Orders
Incoming and Outgoing Parts
Pre-Assembly-Orders
Assembly Orders
Incoming and Outgoing Material
Incoming Goods and Sales
Customers
Inspection
Material Store
Parts Manufacture
Parts Store
Pre-Assembly
Components Store
Assembly
Test Bay
Finishing
Finished Products Store Shipping
Spare-Parts (Components)
Spare-Parts
FLOW OF MATERIAL AND INFORMATION
OPERATION MANUAL PPC/MM

Functional Relationships



Relationships between Managing, Planning, Designing and Controlling as well as Executing

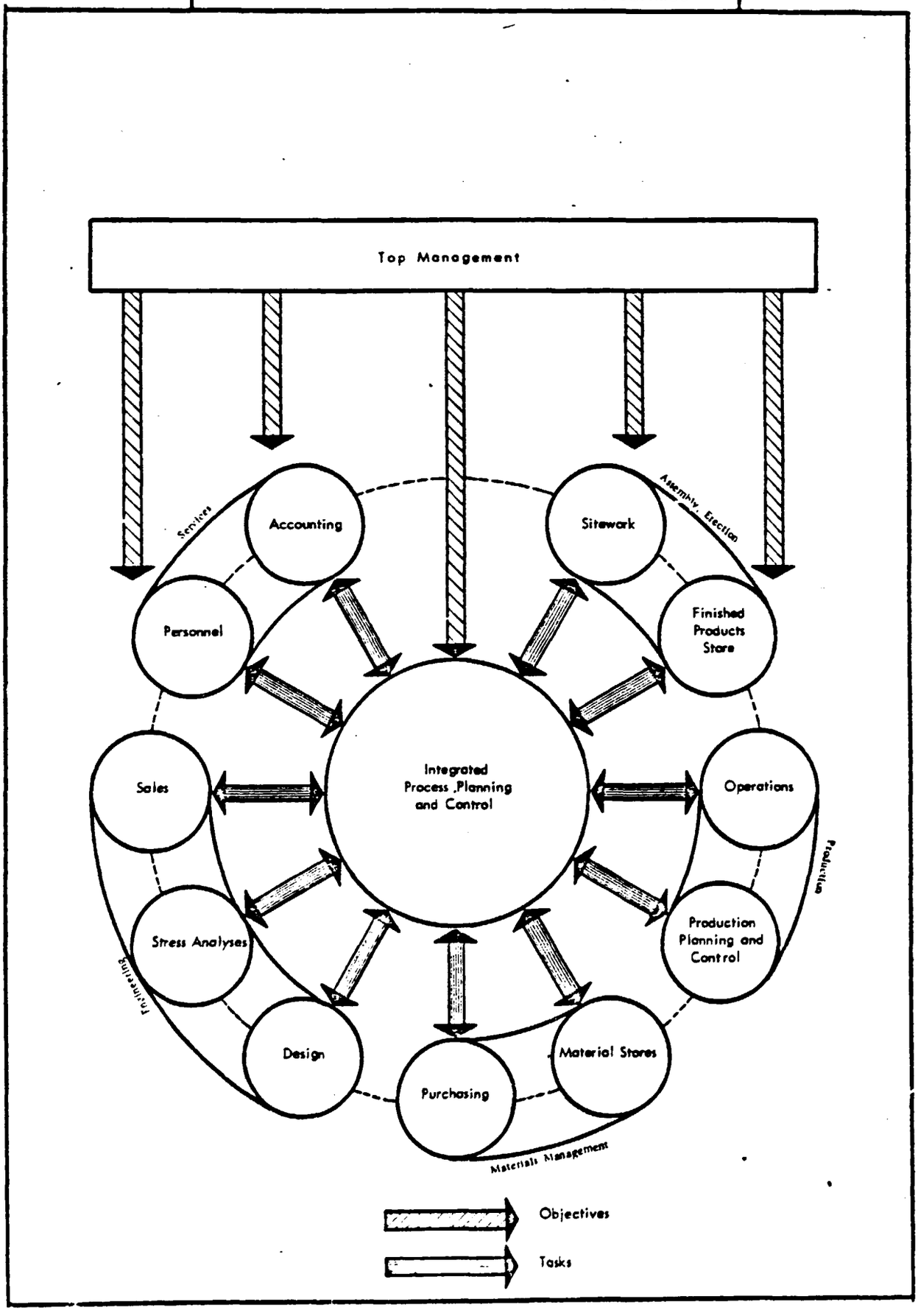
Management is to be understood as the executives as a whole and the entirety of management tasks of a company.

These managerial tasks arise on all levels of a company. It is to be differentiated between:

1) top management level
2) middle management level - Department Manager, Section Manager
3) lower management level - Clerks, Foremen

OPERATION MANUAL PPC/MM

FLOW PROCESS
SYSTEM OF INTEGRATED PROCESS PLANNING AND CONTROL



Job-Order Manufacture

Job-order manufacture signifies the making of products or parts in a lot size of one; they are manufactured only once or at greater, irregular and not predeterminable intervals. Job-order manufacture is a result of production related to customers' orders. Long-range sales planning and developing a far-reaching manufacturing programme are not possible. The manufacturing programme comprises only the necessary services to fill the orders received. The flow process is characterized by a high degree of control activities (follow-up, expediters) which cannot be planned in advance because of the constantly changing tasks. The situation is better in repetitive job-order production where records and data are available (check whether they are up-to-date!).

Characteristic Features of Job-Order Manufacture

- Long machining time: frequent change-overs result in insufficient attention given to optimum machining conditions;
- High proportion of setup time: conditions change after each part;
- High proportion of delay (corrective) allowance: interruptions caused by studying constantly changing job instructions;
- Low capacity utilization because of many setting periods and delay allowances;
- Limited control possibilities: given m machines and n orders $\longrightarrow (n!)^m$ combination possibilities of the sequence of orders being completely independent of each other;
- High portion of idle time, up to 90% of machining time;
- Effects of scrap: spoiled work cannot be compensated by allowances which have been determined on a statistical basis because individual pieces are manufactured; result: delays;
- Expensive quality control because statistical quality control cannot be practised.

4. MAINTENANCE AND REPAIR

4. Maintenance and Repair

The maintenance system below has been worked out and co-ordinated with product-specific conditions as a solution to prevailing maintenance problems, such as the following :

- Reduction
  - o of production equipment downtime
  - o of maintenance expenditure
  - o of consequent damage
  - o of set-up and idling times
- Measures towards
  - o improving the technical condition of production equipment

Practically all NMWC-Plants need improved maintenance and repair urgently.

The system as described below has to be adapted to the specific requirements of each individual plant.

As recommended in the main report this should be effected during a period of appr. 12 months with the assistance of an expatriate expert.

1.1 Duties and Breakdown of Duties

(1) Basic Duties of MAINTENANCE AND REPAIR

The following are the essential duties arising in MAINTENANCE AND REPAIR:

MAINTENANCE PLANNING

↓

IMPLEMENTATION OF PLANNED INSPECTION, SERVICING AND MAINTENANCE MEASURES INCLUDING COST ESTIMATES

↓

ELIMINATION OF DISTURBANCES AND IMPLEMENTATION OF UNPLANNED REPAIRS ON BUILDINGS, MACHINES, PLANT AND EQUIPMENT INCLUDING COST ESTIMATES

↓

TROUBLE-SPOT RESEARCH RELATED TO INDIVIDUAL OBJECTS
COMPILATION OF CATALOGUE OF OPERATIONS FOR LUBRICATION AND PREVENTIVE MAINTENANCE

(2) Delineation of Duties between MAINTENANCE AND REPAIR and the production sections

The delineation of duties between MAINTENANCE AND REPAIR and the production sections as far as maintenance is concerned is laid down as follows:

NMWC	MAINTENANCE AND REPAIR	

MAINTENANCE AND REPAIR	PRODUCTION SECTIONS
- Elimination of disturbances (mechanical and electrical) - Mounting and dismantling of spare parts and sets (mechanical and electrical) - Inspections - Servicing machines and plant (Lubrication and cleaning) - On-the-spot repairs - Dismantling sets, machines and plant to be repaired - Basic overhaul and large-scale repair of machines and plant (mechanical and electrical) - Mounting sets, machines and plant which has been repaired - Preventive maintenance of sets, plant and machines (mechanical and electrical) - Testing and starting up of mounted sets, machines and plant - Compilation of order documents for internal order handling - Requisition of spares, sets, machines and plant - Cost estimation for maintenance operations - Research on and determination of trouble-spots related to specific objects - Compilation of catalog of operations for lubrication and preventive maintenance - Technical advisory service for production on all questions of maintenance - Expert assessment of quotations for maintenance by other companies, in conjunction with MATERIAL MANAGEMENT - Decision of allocating maintenance orders to other companies, in conjunction with MATERIAL MANAGEMENT - Acceptance of machines and plants repaired or delivered by other companies, in conjunction with QUALITY CONTROL	- Servicing machines and plant (lubrication, cleaning) - Cost estimation for service operations

1.2 Description of the System

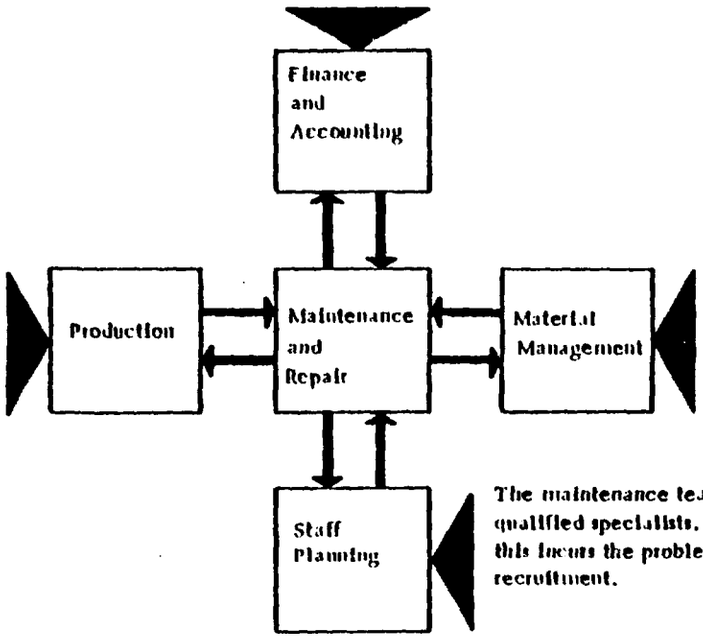
The aim of the following maintenance system illustrated below is to

- guarantee higher operational safety, that is, a higher degree of utilization for machines and plant
- to minimize expenditure, in attaining this operational safety, for work and materials.

The following illustration also shows the functional relationship between MAINTENANCE AND REPAIR and the other sections of the company.

As in the case of all other sections in the company, the operations in MAINTENANCE AND REPAIR are also subject to cost planning and control. Information on economy in maintenance but also such information as is required for forwarding financial and investment planning is acquired. Cost estimates are related to individual objects.

MAINTENANCE AND REPAIR serves to maintain production capacity. Failure to undertake maintenance operations reduces production capacity just as much as carrying out maintenance operations at inopportune times.



Not only staff, but also in most cases materials, exchangeable sets, spares, lubricants etc. are essential in implementing maintenance operations. These must be provided at the right time in the right quantities by MATERIAL MANAGEMENT, while observing principles of economy.

The maintenance team must be made up of qualified specialists. Apart from wages, this incurs the problem of training and staff recruitment.

(1) Definition of Maintenance Measures and Investments

A differentiation must be made in maintenance order handling between

- orders which can be planned and
- orders which cannot be planned or are not worth planning.

Orders for new and extension construction (investments) are in principle always capable of planning.

Maintenance measures which cannot be planned are

- maintenance operations based on breakdowns, which must be carried out immediately.

These cannot be planned as a whole or as regards the time of occurrence.

Apart from new and extension construction orders, other maintenance operations which can be planned are:

- servicing
- inspection
- maintenance
  - o repairs
  - o preventive maintenance.

(2) Servicing

Servicing covers measures aimed at preserving the target condition.

The term "servicing" is connected with damage prevention. Service operations are planned measures which counteract the wear-and-tear process in plant which is still serviceable, and are thus measures which hinder wear-and-tear.

They cover lubrication according to lubrication instructions and regular cleaning of plant, since insufficient elimination of alien material leads to premature wear-and-tear, plant downtime and reduction of service life.

(3) Inspection

Inspections are measures aimed at establishing and assessing the actual condition.

The term "inspection" covers all measures which serve this purpose and which serve to initiate maintenance operations in good time, as far as no preventive maintenance is planned.

Basically this covers examination according to given technical data of all machines and plant.

(4) Maintenance

Maintenance operations are measures aimed at re-attaining the target condition. Here a differentiation must be made between repairs and preventive maintenance.

- Repairs

  The term "repair" must be understood to cover all planned measures towards eliminating damage which are undertaken in order to put a plant, machine, set, assembly or single part into operation again.

- Preventive Maintenance

  The term "preventive maintenance" covers all measures taken to keep plant and machines operational; these are planned so that they are effective before an unforeseeable breakdown or downtime, resulting from damage, occurs.

  Preventive maintenance is based on the principle of well-timed and planned exchange of elements which, due to load, are subject to wear-and-tear in the due course of time (utility and operational time).

  To hinder unexpected and inopportune downtime in plant and machines, recognition and elimination of damage in good time must be guaranteed.

  This can be brought about by

  o periodic, planned times (operational hours) for exchange of all highly loaded elements or assemblies, to be undertaken during planned or unplanned downtime.

- regular and pre-planned inspections of equipment and machines in order to investigate damage in time.

(5) Other Maintenance Measures and Investments

- New constructions and investments

MAINTENANCE AND REPAIR also carries out new constructions and investments. Orders for these are places by the relevant departments when capacity is available and must be planned by MAINTENANCE AND REPAIR.

1.3 Overall Schedule

(0) Introduction

The overall MAINTENANCE AND REPAIR schedule is broken down into the following sections:

- Maintenance Planning
- Planned Maintenance
- Unplanned Maintenance
- Order Accounting
- Trouble-Point Research and Determination of Maintenance Strategies

(Chapter 13, Annex 1)

(1) Maintenance Planning

MAINTENANCE AND REPAIR works out annual programmes for inspections, servicing and preventive maintenance of machines, equipment, furnishings and buildings.

These individual programmes are combined and summarized in monthly maintenance programmes which take account of necessary investment measures to be worked out by MAINTENANCE AND REPAIR.

Maintenance materials requirements are also established in the course of maintenance programme planning.

(2) Planned Maintenance

The activities given in the maintenance programme are transferred into individual measures, to be handled as single orders.

The planned measures are carried out by MAINTENANCE AND REPAIR after MATERIAL MANAGEMENT has supplied the necessary materials. The operational times involved must be noted and passed on to Staff Management.

(3) Unplanned Maintenance

Breakdowns occurring in machines, equipment and installations in the production sections as well as in the other departments must be reported by the staff to MAINTENANCE AND REPAIR.

MAINTENANCE AND REPAIR undertakes an analysis of the damage. The results of the analysis are entered in the order documents and serve both as job instruction and towards order planning.

The subsequent order handling is the same as in the case of planned maintenance.

(4) Order Accounting

The

- MAINTENANCE AND REPAIR production costs
- materials costs
- outside services

incurred are settled monthly order by order as related to the individual objects.

(5) Trouble-Point Research and Establishment of Maintenance Strategies

Cases of damage are summarized according to objects, based on the order Accounting and breakdown reports data media. This leads to determination of trouble-Points as related to individual objects. Maintenance strategies for

- inspection
- servicing
- preventive maintenance

are related to individual objects and are to be found in

- inspection programme planning
- servicing programme planning
- preventive maintenance programme planning.

2 Maintenance Planning

2.0 Introduction

Maintenance Planning covers the following duties:

- annual programme planning of inspections, servicing and preventive maintenance
- monthly maintenance programme planning
- determination of maintenance materials requirements.

The aim of MAINTENANCE AND REPAIR is to guarantee implementation of the planned

- inspections
- servicing
- preventive maintenance

as well as of unplanned

- breakdowns
- repairs

and to utilize capacity optimal. The possibility of placing orders outside is also to be taken into account.

Inspection, servicing and preventive maintenance programme planning is broken down into two sections with regard to time. These are annual planning, carried out at the end of each year for the following year, and monthly planning, carried out at the end of each month for one month.

2.1 Annual Programme Planning

Separate maintenance programmes are drawn up for the maintenance measures

- inspection
- servicing
- preventive maintenance.

The annual maintenance programme covers all machines, equipment and installations according to sections.

The relevant maintenance programme is compiled in detail with the aid of the following steps:

- Adaptation of servicing and inspections plans supplied by manufacturers for each object (see Chapter 2.1, Annex 1)
- Adaptation of preventive maintenance measures related to individual objects
- Calculation of probable capacity according to type and extent, taking the volume of breakdowns and unplanned repairs into account
- Allocation of maintenance measures to the capacity units
- Balancing out capacity
- Documentation of the annual maintenance programme

The results of these individual steps are laid down in the relevant annual programme for

- inspections
- servicing
- preventive maintenance.

The form shown in Chapter 2.1, Annex 2 is used for this purpose.

The maintenance code numbers for each objects are entered in the relevant monthly column.

NMNC	MAINTENANCE AND REPAIR	
	FAULT RECORDING	

Equipment		Servicing and Inspection Plan No.
Manufacturer:	Inventory No.	
Type:	Serial No.	
Manufacture Year:	Location	
Capacity:	Cost Centre	No.:

Cost	
Parts Replaced	
Repair	
Fault	
Date	
No.	

NMWC	MAINTENANCE AND REPAIR	
	SERVICING AND INSPECTION PLAN	

Equipment		Servicing and Inspection Plan No.
Manufacturer	Inventory No.	
Type	Serial No.	
Manufacture Year	Location	No.:
Capacity	Cost Centre	

No.	Oper.	Operations to be performed	Frequency	Co-ord. character.

NMWC	MAINTENANCE AND REPAIR	
	ANNUAL PROGRAMME	

ANNUAL PROGRAMME FOR...
PROGRAMME No.:
SECTION

Object Designation	No.	Months											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.

2.2 Monthly Maintenance Programme Planning

The monthly maintenance programme is drawn up at the end of each month for the following month according to sections. In the course of this process, the plan months in the relevant annual maintenance programme are integrated into a monthly programme, taking inspection results into consideration. The procedure involved in compiling the monthly maintenance programme can be broken down into the following steps:

- Summary of the actual situation in MAINTENANCE AND REPAIR
- Adaptation of the operations contained in the annual maintenance programme for the relevant month
- Calculation of probable capacity for the monthly planning period, taking into account the portion of capacity required for eliminating breakdowns and carrying out unplanned repairs
- Allocation of maintenance measures to the capacity units
- Balacing out capacity
- Documentation of the monthly maintenance programme.

The results of the individual steps are laid down in the monthly maintenance programme.

The form shown in Chapter 2.2, Annex 1 is used for this purpose.

The maintenance code number for each object is entered in the relevant monthly column.

MONTHLY MAINTENANCE PROGRAMME No.:

Section:

NMWC

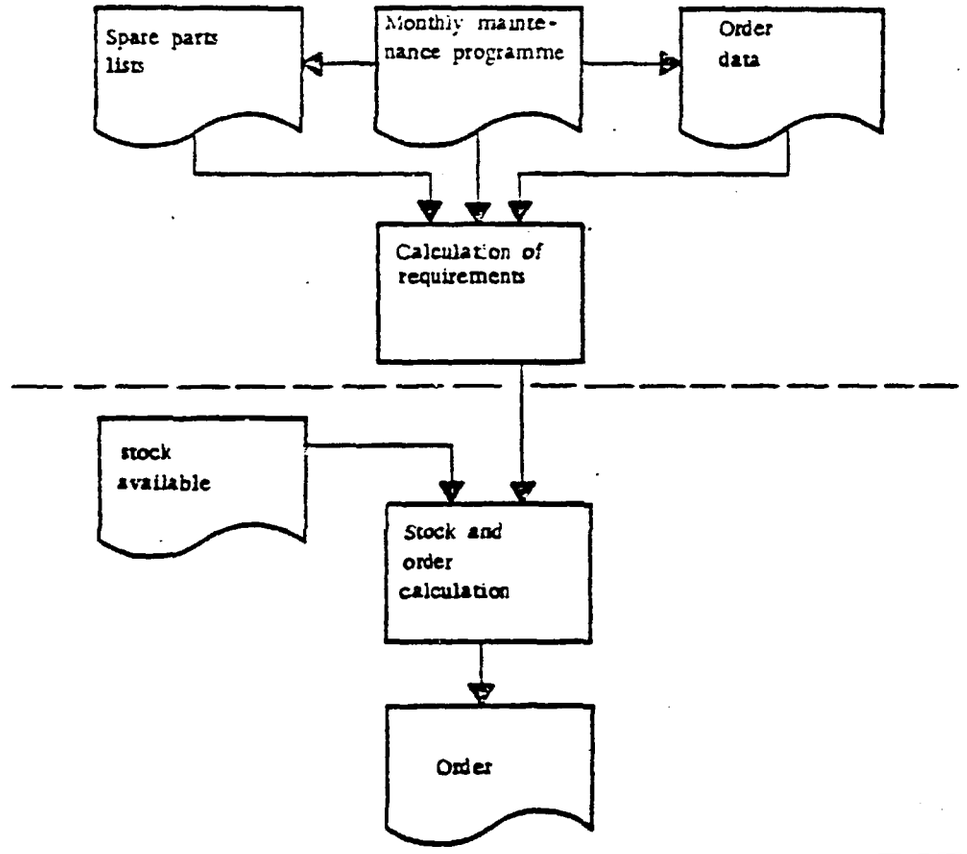
MAINTENANCE AND REPAIR

MONTHLY MAINTENANCE PROGRAMME

Object Designation	No.	Day 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.

2.3 Calculation of Maintenance Materials Requirements

Materials requirements depend on the monthly maintenance programme, and can be calculated by summarizing the materials listed for the measures planned.



To cover materials for unplanned repairs and for elimination of machine and plant breakdowns, which are not included in the monthly maintenance programme, MAINTENANCE AND REPAIR in conjunction with MATERIAL MANAGEMENT lay down minimum and maximum stocks for materials required in the production sections.

The planning of these materials is undertaken by MATERIAL MANAGEMENT on the basis of consumption.

As a prerequisite for proper maintenance a complete and detailed inventory of all machinery and equipment is needed. The "Record Card" attached may be used, i.e. filled in for each machine.

This work can be done by the technical staff of the plants under guidance and assistance of one of NMWC's advisory team.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

(AWF)® Record Card for

Description	Type	Inv. No.
Manufacturer	Ser. No.	Date of order
Supplier	Year built purchased	Date of delivery

Specifications	Accessories	
		Location
		Belongs to group
		Cost bracket
		Degree of precision
		Especially Suitable for
	Photo and Floor Space Dimensions	

Employ the data compiled by the AWF (Committee for economic production). Ask for publication list free of charge

Order-No. **AWF 3002-W/E** Reprint prohibited (5.80 12)

Floor Dimensions ft × ft Height ft Weight cwts	Date issued Name
Type of Drive Group Motor built in	Manufacturer of Motor
Voltage V Type of Supply Y/∆ s⁻¹	Total Power required kW (HP) η (Efficiency)

Motor list	Manufacturer	Motor type and No.	Style according to (German standard Spec.)	Power in kW	R. P. M.	Motor Invent. No.

Flat/Vee-Belts Material	Main Drive Width of Pulley Pulley Dia	**R. P. M., speed of stroke or feeds**
Step, Switch Pos'n, Motor R. P. M. Change Wheels		

Max. chip section by rated capacity of motor		

Remarks:

Use margin for pasting on supplementary cards or perforated strips (See instructions for Use of AWF Record Cards, Order No. AWF 3000 E)

Use AWF No. 3001 E cost accounting card for depreciation, etc. Use AWF No. 3004 E supplementary card for entries covering modifications and repair work

Ausschuß für Wirtschaftliche Fertigung e. V. (AWF), Düsseldorfer Straße 40, 6236 Eschborn/Ts., Tel. (06196) 4864

5. DEPARTMENTAL COST ACCOUNTING AND CONTROLLING

Departmental Cost Accounting

The central point is departmental cost accounting which is effected on various cost center sheets (Form 522-1). It serves budgeting, absorbing and control of types of cost at cost centers. (Alternately a cost distribution sheet could also be used for this purpose, but such sheets are unwieldy and therefore not recommended.)

Departmental cost accounting involves indirect costs which are composed of material, staff, administrative, marketing and imputed costs as primary cost and of apportionments as secondary cost. They are budgeted and absorbed per cost center while direct costs such as direct material and supplementary cost are attributed directly to the order or the cost incurring product and are not recorded under cost centers.

Form 522-1 is the cost center sheet which has to be prepared for every cost center. All of these cost center sheets together form the so-called cost distribution sheet (Master Summary Sheet); the data are useful for planning (entries under "Planned") as well as for registration of actual costs and finally to record deviations. The primary costs apply to all cost centers. After their summation the general cost centers can be dissolved by means of apportioning and be distributed to the other cost centers; this is done on the lines provided for this purpose. Total costs and technical data are to be entered and related cost ranges to be computed in the lower part of the cost center sheet.

Types of cost are recorded on cost center sheets as follows:

- Costs of indirect material consumption are recorded by requisition slips and attributed directly to the cost center. Forms 522-2 (General Cost Distribution Sheet) and 522-3 (Cost Distribution Sheet for Electric Power) serve to facilitate the transfer of types of costs to cost center sheets.
- Staff expenses of the various groups of cost types are broken down by cost centers in the payroll office and furnished to cost accounting each month.
- The amount of administrative and marketing costs is shown in the accounts of financial accounting (giving also the cost center number concerned); they are attributed by the distribution lists (Form 522-2).
- Imputed costs contain imputed depreciation and interest. Imputed depreciation is taken from the property ledger and entered on a distribution sheet (property ledger = file of assets). Imputed interest is distributed on the basis of interest incurring capital per cost center (by distribution sheet, see Form 522-4).

Collection of costs at cost centers and their comparison with budgeted costs are monthly operations.

In case of deviations exceeding 10% between actual costs and planned costs the causes are to be analyzed and comments are to be given to cost center and area heads not later than on the 15th of the following month in order to decide on actions to be taken.

OPERATION MANUAL MANAGEMENT ORGANISATION	Form 522-1
	Sheet 1 of 1
COST CENTER SHEET	Effective Date

Cost Center Number: _____ Period:

Line	Summation Line	Types of Cost No.	Designation	Planned Cumulated	Planned Monthly	Actual Cumulated	Actual Monthly	Deviation Cumulated	Deviation Monthly
1		40/42	Material consumption and the like						
2		4301	Direct labour and assembly wages						
3		4302	Indirect labour and assembly wages						
4		4303	Salaries						
5		4304/9	Other wages and salaries						
6	2-5	43	Wages and salaries						
7		44	Social cost						
8	6 + 7	43/44	Staff expenses						
9		451/5	Maintenance of capital assets						
10		456	Design and development cost						
11		459	Miscellaneous services						
12	9-11	45	Maintenance, various other services						
13		460/2	Taxes, fees and rates						
14		463/5	Legal, auditing and consulting costs, dues						
15		466	Insurance premiums						
16	13-15	46	Taxes, fees, dues, insurance premiums and the like						
17		471	Rentals, leases						
18		472/5	Traffic and office expenses						
19		476/9	Advertising and sundry costs						
20	17-19	47	Rentals, traffic, motor pool, advertising, office expenses and the like						
21		48	Imputed costs						
22	4, 8, 12, 16, 20, 21	40-48	Total I						
23		40-42	Store orders - material consumption						
24			Store orders - direct labour						
25	23 + 24		Store orders						
26	22 + 25		Total II						
27	Apportionment								
28	Apportionment								
29	Apportionment								
30	Apportionment								
31	Apportionment								
32	Total apportionments, lines 27-31								
33	Sum of total cost, lines 26 + 32								
34	Base, e.g., direct labour, manufacturing costs, direct material								
35	Rate of mark-up - actual, line 33 : 34								
36	Rate of mark-up - planned								
37	Planned costs								
38	Excess cover								
39	Undercover								

KU 133

Form 522-2

Sheet 1 of 1

DISTRIBUTION SHEET

Month

Effective Date

Types of Cost

Cost Centers

KU 133

OPERATION MANUAL MANAGEMENT ORGANISATION	Form 522-3
	Sheet 1 of 1
COST DISTRIBUTION SHEET FOR ELECTRIC POWER	Effective Date

Shop: Period:

Cost Center	No.	Prime Power kW	Load in %	Operating Hours	kWh Consumption	Absorbed Rate/kWh	Costs
Total							

KU 20

OPERATION MANUAL MANAGEMENT ORGANISATION	Form 522-4
OPERATIONAL INTEREST Absorption of Imputed Interest in Departmental Cost Accounting	Sheet 1 of 1 Effective Date

Breakdown	Rp.

ABSORPTION OF IMPUTED INTEREST IN DEPARTMENTAL COST ACCOUNTING

Item	Record	Cost Center to be Charged or Credited	Rp.
1. Imputed residual values of working capital assets	File of assets	According to distribution of capital assets by cost centers	
2. Circulating capital required, consisting of average tied-up inventories of			
- cash funds	according to balance sheets	Finances and Control (as "trustee" of these assets)	
- securities of circulating capital	according to balance sheets	same	
- accounts receivable - trade	according to balance sheets	Marketing / Sales	
- accounts receivable - sundry	according to balance sheets	Marketing / Sales or Finances and Control	
- raw materials and supplies	according to balance sheets	Materials Management	
- semi-finished and finished products inventory	according to balance sheets	PPC	
		finished products = Sales	
3. Outside capital free of interest (deductible capital)			
- accounts payable - trade	according to balance sheets	Materials Management	
- accounts payable - sundry	according to balance sheets	Finances and Control	
- short-term liabilities	according to balance sheets	Finances and Control	
Total Imputed Interest			

Concept

The cost accounting and budgeting system which is specified for the Corporation will integrate in an overall accounting system the product groups of the new units Bisma and Turangga (Diesel engines, centrifugal pumps and patjols including spare parts) with those of the old unit Indra (steel structures and machine building). The first three product groups are manufactured in series production while steel structures and machine building involve mainly job order production.

The cost accounting system shall provide the following:

- departmental cost accounting by means of budgeted cost standards per cost center and cost control per cost center (comparison between standard and actual) (monthly);
- cost estimates and historical costing of direct costs per order showing contribution margin and deviations (monthly);
- calculability of all products by means of machine hour rates or production hour rates (on the occasion of essential changes in the cost structure);
- valuation of semi-finished and finished products (monthly);
- income statement per cost-incurring product group as combined fully allocated costing and direct costing (quarterly).

The cost accounting system is based on the figures of financial accounting. Cost centers are numbered separately and are not integrated into the general chart of accounts.

Cost Finding

For precosting and historical costing of orders it is sufficient on principle to limit this operation to direct costing where predetermined and historical direct costs (individual cost and supplementary cost) are compared in order to detect deviations and to take proper action. The difference to order proceeds shows the contribution margins which have been obtained.

The general lines of the total cost structure are shown in Form 523-1. This form shows already some traits of the cost finding scheme because unit costing can only reproduce a section of the total cost structure. The indirect cost ranges to be determined in Form 523-1 on the basis of the total cost structure are marked separately in the last column of this form. Since the product structure will differ widely, each product family will have its own total cost structure.

In our opinion absorption costing of individual products for purposes of valuating semi-finished and finished products and determining prime cost as a measure of sales prices needs to be done only every six months or on the occasion of essential changes in the cost structure. For this purpose rates of mark-up are determined in departmental cost accounting and machine and manufacturing hour rates are developed.

The results of cost finding are manufacturing costs as direct costs, subdivided by material and production, and computed prices; they can be compiled and kept up to date in the list of sales and standard prices

In the beginning it will be sufficient to go through the programme of engine types and pump models as well as patjols and to develop a list of standard prices at prime cost.

In historical costing all material withdrawals from stocks are substantiated and evaluated by material requisition slips. These slips are collected by orders. The entire material consumption of an order is determined upon receipt of a completion report or periodically in cases of large orders.

All other direct costs (supplementary costs) are also collected per order and recorded on the costing form. The labour cost incurred should only be prorated to an order when they account for a major part of total direct costs. In this case the wage slips per cost center would have to be rearranged according to orders.

Form 523-2 is a list of material consumption on the basis of valued requisition slips for direct material; it is useful to prepare this list once a month. It specifies groups of material which correspond to collective accounts in bookkeeping. Inventory differences in each of these groups can be determined when the inventory is taken on the basis of these groups of material. Errors are thus easily detected and proper action can be taken. Moreover, differences may occur between actual consumption as determined by the above method, perhaps adjusted by inventory-taking, and the calculated consumption according to cost finding and the subsequent valuation of sold products.

OPERATION MANUAL MANAGEMENT ORGANISATION	Form 523-1
	Sheet 1 of 1
SCHEME OF TOTAL COST STRUCTURE	Effective Date

Shop:		Period:			
Line	Types of Cost	Variable	Fixed	Total	%
1	Direct material		-		-
2	Components		-		-
3	Attaching parts		-		-
4	Material costs I		-		-
5	Material overhead of line 4				
6	Material costs II				-
7	Direct labour		-		-
8	Assembly wages		-		-
9	Wage proportionate costs		-		-
10	Other indirect product costs	-			-
11	Other production costs		-		-
12	Sum of production costs				-
13	Sum of manufacturing costs				-
14	Design overhead of line 13				
15	Administrative overhead of line 13	-			
16	Sales overhead of line 13	-			
17	Packaging		-		-
18	Freight outward		-		-
19	License		-		-
20	Commission		-		-
21	Discounts		-		-
22	Rebates		-		-
23	Sum of supplementary costs of line 13		-		
24	Prime cost				-

= Computation of overhead rates which are applicable to cost finding

KU 25

OPERATION MANUAL
MANAGEMENT ORGANISATION

Form 523-2

MONTHLY MATERIAL CONSUMPTION AS PER VALUED REQUISITION SLIPS

Shop: Month:

No.	Material Group	Consumption Value	Account
1	Consumption of raw materials and blanks		
2	Components		
3	Assemblies		
4	Purchased parts / standardized parts		
	Total		

6. REMUNERATION

6.1 WAGE SYSTEM
Industrial Employees

6.1.1 Working Hours

6.1.1.1 Regular Working Hours

(Under this heading the policies for working hours are to be entered, such as

- Regular weekly working hours without breaks are 40 hours;
- Time for changing clothes and washing as well as breaks are not considered working hours.)

6.1.1.2 Overtime, Night Work, Sunday Work, Holiday Work

- Overtime are working hours over and above the regular working hours per week.
- Night work are hours worked from 22.00 to 06.00 hours.
- Regular night work prevails when it is done for at least one work week.
- Sunday and holiday work is the work done on Sundays and legal holdidays during the time of 06.00 hours to 06.00 hours of the following workday.

6.1.1.3 Allowances for Overtime, Night Work, Rotating Shift Work, Sunday Work, Holiday Work

The allowance is as follows:

a)	for the first to 6th overtime hour per week	25%
	as of the 7th overtime hour per week	50%
b)	for regular night work (also for rotating shift work between 22.00 and 06.00 hours)	15%
c)	for irregular night work	50%
d)	for Sunday work	50%
e)	for work done on legal holidays	100%

The calculation of allowances has to be based on the following:

hourly wages in case of straight time pay earners;

hourly wages in case of piece rate and incentive wage earners;

When several types of allowances apply only the highest one involved has to be paid.

6.1.2 Remuneration

6.1.2.1 General Provisions

- Work is done for time rates, piece rates or incentive wages either on an individual basis or a group basis.

- Day work is such work for which the time needed to do the work is not predetermined.

- Piecework is such work for which the time needed to do the work is predetermined on the basis of normal human performance, and where the time expenditure and the quantity of output can be influenced by the operator.

  Allowances are made in the form of time or money. Time allowances are time rates, money allowances money (piece) rates.

- Incentive Work
  Incentive wages are a particular type of remuneration where in addition to the standard wage an incentive is paid for the attainment of a determined output.

- Group Work
  Group work is the direct collaboration of several operators to join forces in the execution of an order or part of it.

  A group may work at one work station or at several stations or machines.

6.1.2.2 Classification Principles

- Wage payment is effected in accordance with the standards set for the execution of the work by classification in one of the wage groups according to the wage group criteria under section 6.1.2.3.
- The ratio of wage groups is expressed by a wage group code whereby the comparative basis is Group 5 as basic wage = 100%. This basic wage is the wage of a skilled worker.
  Working from this basic wage the individual base wage rates are figured out by applying the wage group and age bracket codes.

6.1.2.3 Wage Classification

Wage Group 02
Light manual work which can be done without previous knowledge after functional training or an induction period of at least four weeks.

Wage Group 03
Light manual work which can be done after a training period of three months and after acquiring professional skill, practice and experience.

Wage Group 1
Simple work with physical stress which can be done without previous knowledge of the job after a short induction period.

Wage Group 2
Work with higher physical demands which can be done without previous knowledge of the job after an induction period.

Wage Group 3
More complicated physical work requiring functional training or systematic induction of three months and professional skills, practice and experience.

Wage Group 4
Work requiring special skill which has been acquired by completed induction training in a recognized industrial semiskilled occupation or by knowledge of the job and experience of equal value.

Wage Group 5
Skilled work requiring in addition to occupational dexterity and occupational knowledge a training level which is acquired by an apprentice training period in this occupation with certificate of apprenticeship as skilled worker or which requires knowledge of

equal value enabling the individual to execute all work because of many years of experience.

Wage Group 6
Qualified skilled work requiring special skills and many years of occupational experience.

Wage Group 7
Highly qualified skilled work requiring high standards of skills and knowledge as well as independent working.

Wage Group 8
Extremely qualified skilled work requiring outstanding skills, high degree of independence, planning abilities, comprehensive sense of responsibility and appropriate theoretic knowledge.

Comments:
Functional training is a training period for specific operations which cannot be executed after simple initiation.
Induction is to provide systematically various basic skills.
The notions "initiation, functional training, induction" do not mean "job acquaintance".

6.1.2.4 Wage Code and Age Requirements

Wage Group	02	80.0%
Wage Group	03	82.0%
Wage Group	1	82.0%
Wage Group	2	84.0%
Wage Group	3	88.5%
Wage Group	4	93.0%
Wage Group	5	100.0%
Wage Group	6	110.0%
Wage Group	7	120.0%
Wage Group	8	133.0%

Up to the age of 18 years 80.0% of the above rates.

6.1.2.5 Payment of Wages for Day Work

Employees doing work for time rates are entitled to the wages which have been bargained collectively for their wage group as minimum wage.

6.1.2.6 Payment of Piece Rates and Incentives

After creation of the technical and organizational prerequisites the introduction of piece rates or incentives may be agreed upon.

6.1.3 (Moreover, all other personnel policies may be incorporated in this part of the Operation Manual, such as

- absenteeism,
- Illness and death,
- granting of vacations, duration of vacation, payment during vacation,
- Recruitment and dismissal.)

6.2 SALARY SYSTEM
Salaried Employees

6.2.1 Working Hours

6.2.1.1 Regular Working Hours

- The regular working hours without breaks are 40 hours per week.
- The distribution of regular working hours to the various weekdays as well as beginning and end of daily working hours and of breaks are fixed by the employer in accordance with operational requirements and by observing all legal provisions concerning working hours.
- For shop foremen and other shop employees who collaborate directly with workers the working hours apply which have been fixed for the workers of the shop or department concerned.

6.2.1.2 Overtime, Night Work, Sunday Work, Holiday Work

- Overtime are working hours over and above regular weekly standard hours.
  Occasional, i.e., not regularly recurring exceeding of regular daily working hours to a limited extent is included in the monthly salary; regular overtime is subject to remuneration as of the first hour.
- Night work are hours worked from 22.00 to 06.00 hours.
  For shop foremen and other shop employees the hours worked by workers of the shop concerned as night work are also considered night work.
- Regular night work prevails when it is done for at least one work week.
- Sunday and holiday work is work done on Sundays and legal holidays during the time of 06.00 hours to 06.00 hours of the following workday.

6.2.1.3 Allowances for Overtime, Night Work, Rotating Shift Work, Sunday Work, Holiday Work

The allowance is as follows:

a)	for the first to the 6th overtime hour per week	25%
	as of the 7th overtime hour per week	50%
b)	for regular night work (also for rotating shift work between 22.00 and 06.00 hours)	15%
c)	for irregular night work	50%
d)	for Sunday work	50%
e)	for work done on legal holidays	100%

- The hours which are liable to extra payment under the above provisions have to be remunerated at 1/173 of the monthly salary plus the nominal allowance.
  The monthly salary are the salary emoluments in the month in which the work liable to extra payment was done.
  When several types of allowances apply at the same time, only the highest one involved has to be paid.
- Lump sum payment may be agreed for the remuneration of overtime, night work, Sunday and holiday work. Such payment has to be shown separately in the salary roll.

6.2.2 Salary Provisions

6.2.2.1 General Classification Principles

- Salaried employees are classified in the various salary brackets in accordance with their activity.
  Thus only the activity practised by the salaried employee serves as rule for his classification and not his title.
- The skeleton agreement on salaries contains the criteria of standard salary brackets as well as examples of typical activities.
  The examples are benchmarks; in conjunction with the salary bracket criteria they justify the right to appropriate classification. The salary bracket criteria serve as rule for the classification.
- If the criteria of a salary bracket apply to a specific course of training which the salary earner concerned has not completed, he has to be classified in this bracket if his activity meets the requirements of this salary bracket.

On the other hand, a particular course of training does not justify in itself a right to classification in a certain salary bracket if the assigned activity does not require such course of training.

- If the sphere of activity of a salaried employee covers several activities which are attributed to different salary brackets, the employee concerned is to be classified according to the dominant activity.

  In assessing the salary level the other activities are to be given due consideration inasmuch as they are of higher value.

- If a salaried employee pursues an activity on a temporary basis which is attributed to a higher salary bracket than his own, he acquires no right to a higher salary.

6.2.2.2 Salary Bracket Criteria

A. Clerks

K 1

Employees doing mainly schematic work requiring a certain skill but no vocational qualification.

Examples:
Helpers for simple office work.
Simple filing work.
Typist - beginner.
Shorthand typist - beginner.
Telephone operator - beginner.

K 2-a),b)

Employees doing work after thorough instruction and requiring knowledge and skills which are generally provided by training of trainees in a relevant and recognized semiskilled occupation.
These skills and knowledge may also have been acquired by another training or corresponding practical work.

Examples:
a) Shift clerk,
Typist,
Helpers for simple office work with over 2 years practice,
Telephone operator of small installations up to 3 exchange lines and 20 house telephones,
Shorthand typist.

b) Shorthand typist (at least 120 syllables and 250 strokes),
Telephone operator for larger installations,
Employees making out orders, reminders, invoices, credit and debit notes, dispatch notes or freight bills as dictated or on the basis of copies,
Employees keeping subsidiary ledgers,
Bookkeeping employees doing simple transfer work requiring no particular bookkeeping knowledge,
Telex operator.

K 3-a),b)

Employees doing work requiring knowledge and skill as generally provided by an apprenticeship to become clerk in an industrial firm. These skills and knowledge may also have been acquired by another training or corresponding practical work.

Examples:

a) Assistant cashier.
Correspondence clerk - first job.
File keeper in storeroom.
Correspondence clerk - shorthand typist.
Assistant bookkeeper.
Costing clerk - first job.
Accountant for simple audits.
Machine accountant.
Shift clerk with more experience.
Invoice clerk - first job (working on the basis of prepared records).
Shipping employee.
Employees in production offices (for instance, for production reports).
Payroll clerk - first job.
Timekeeper for piece rates.
Planning clerk - first job.
Employees doing statistical work.
Chief operator of large telephone exchanges.
Employees doing difficult filing work.

b) Health insurance clerk.
Invoice clerk.
Employees with higher responsibility in production offices.
Planning clerks.
Piece rate accountant - first job.

K 4

Employees dealing with a field of activity or working on records, files, correspondence etc. on the basis of general directives, such work requiring knowledge and experience as generally provided by

an apprenticeship to become clerk in an industrial firm, and subsequent several years' relevant activity. This knowledge and experience may also have been acquired by another training or corresponding practical work.

Examples:
Employees doing superior secretarial work including difficult correspondence on the basis of some cues.
Payroll clerk.
Correspondence clerk.
Clerk handling transport, shipping or customs clearance matters.
Store ledger's clerk.
Cost accountant.
Financial accountant.
Costing clerk.
Cashier.
Auditor.
Invoice clerk for difficult price structures.
Piece rate accountant.
Employees translating fluently simple texts or handling simple correspondence in foreign languages.
Employees handling offers and/or orders including control of schedules in purchasing and sales departments.
Employees doing statistical work independently.
Heads of complex filing systems.

K 5-a),b

Employees dealing independently with a more difficult field of activity along general lines, such work requiring thorough specialized knowledge and extensive relevant experience as well as understanding of relationships with closely related fields of activity.

Examples:
a) Piece rate accountants in large production establishments with complex production.
Payroll clerks.
Correspondence clerks in purchasing, sales and administration.
Store ledger's clerk.
Financial and cost accountant.
Costing clerk.
Auditor.
Invoice clerks.
Employees translating fluently difficult texts or handling difficult correspondence in foreign languages.
Functional heads.

Qualified personnel having more knowledge and responsibility than comparable employees in Salary Bracket K 4.

b) Employees working independently in internal audit departments, group leaders in purchasing and sales, in the payroll office, in materials management and general administration, in cost and financial accounting departments, in shipping and in accounting departments.

K 6-a),b

Employees handling independently and responsibly a difficult field of duties requiring versatile specialized knowledge - including specialized knowledge in related fields - and many years of professional experience, as well as specialists handling responsibly an equivalent field of activity.

Examples:
a) Office managers.
Employees supervising difficult purchasing or sales transactions.
Employees directing and supervising several large stores or one central store.
Employees handling difficult finance, tax or insurance matters.
Employees translating fluently difficult texts or handling difficult correspondence in at least 2 foreign languages.

b) Office managers of large offices.
Chief cashiers.

B. Technicians

T 1

Employees doing mainly schematic work requiring a certain skill but no vocational qualification.

Examples:
Employees lettering drawings and writing tables on the basis of simple records.
Employees writing and amending bills of material on the basis of simple records.
Blueprinters.
Employees doing arranging work by simple criteria.

T 2-a),b)

Employees doing simple work after thorough instruction and requiring knowledge and ability which are generally provided by training in a relevant and recognized semiskilled occupation.

This knowledge and ability may also have been acquired by another training or corresponding practical work.

Examples:

a) Employees copying or redrawing simple general drawings or survey diagrams on the basis of well defined original copies.
Draftsmen for circuit diagrams, working diagrams and wiring layouts on the basis of well defined original copies.
Draftsmen for simple graphs and for tables.
Employees preparing simple bills of material.
Employees entering job time on the basis of available tables.

b) Draftsmen for components on the basis of original copies.
Employees reporting the requirements for simple parts on the basis of records and determining the required material quantity by simple computation.
Helpers in laboratories, material testing departments and experimental stations and other technical helpers.

T 3-a),b)

Employees doing work after thorough instruction and requiring knowledge and ability as generally provided by recognized apprentice training to become technician. This knowledge and ability may also have been acquired by another training or corresponding practical work.

Examples:

a) Employees preparing bills of material for shops and offers.
Employees computing and reporting the required quantity of material.
Employees making time studies but not analyzing them.
Employees determining job times for simple operations.
Employees preparing simple production plans.
Employees carrying out expertly investigations, studies, measurements by known methods in shops, testing rooms and experimental stations, laboratories.
Draftsmen for plotting and drawing of components.

b) Draftsmen)
Laboratory assistants)
Material testers) With several years relevant activity after being out of their indenture.

T 4

Employees doing defined work under instructions, such work requiring thorough specialized knowledge and professional skills.

Examples:
Draftsmen preparing individual and group shop drawings of difficult types by drafts.
Employees computing or designing components, tools or fixtures.
Employees preparing circuit diagrams, working diagrams and wiring layouts.
Employees conducting simple stress calculations.
Employees determining the requirements of parts and material quantity for difficult production.
Employees making time studies and their analysis.
Employees making technical calculations for offers and shop purposes.
Employees conducted special internal studies and/or simple development work in shops, testing and experimental stations or laboratories.
Employees conducting investigations of analytical, synthetic or measuring type with complicated handling of instruments.
Employees making computations and/or studies on energy requirements and consumption.
Employees supporting the management of shop departments, workshops or small shops with simple production.

T 5-a),b)

Employees dealing independently with difficult tasks along general lines, such work requiring comprehensive specialized knowledge and experience as well as an understanding of relationships in this field.

Examples:
a) Employees preparing part designs and dimensioning machine parts, tools or fixtures of complex type.
Employees engaged in stress analysis and/or structural analysis.
Employees conducting difficult investigations or development work in production shops, testing and experimental stations or laboratories.
Employees conducting difficult studies and/or computations for energy requirements and consumption.
Erection and building site supervisers.

b) Employees conducting difficult and/or comprehensive work studies.
Employees conducting difficult and/or comprehensive technical calculations for offers and shop purposes.
Employees supporting the management of large production departments or workshops or managing small shops with simple production.
Employees supervising a small group of designers.

T 6-a),b)

Employees handling independently and responsibly a difficult field of duties requiring versatile specialized knowledge - including specialized knowledge in related fields - and many years of professional experience, as well as specialists handling responsibly an equivalent field of activity.

Examples:

a) Employees preparing designs and computations of machinery, equipment, or essential parts thereof which are of a difficult type.
Employees planning difficult or complex electrical measuring and control instruments.
Employees conducting difficult stress analyses and/or stability computations.
Employees dealing independently with difficult and complex cost estimates for offers and/or operations.
Erection and building site managers.

b) Employees planning and designing difficult or complex productions and/or equipment, also considering new production methods which may have to be developed.
Group leaders or office managers in large technical departments.

C. Shop Foremen

1. Definition

Shop foremen have a directing and supervisory function in a production shop or a production department. They distribute work to subordinate workers and are responsible for proper and efficient execution of the work. Shop foremen must be appointed expressly as such.

2. Classification

Group M 1

Foremen supervising in a simple field of operations mainly unskilled workers.

Group M 2-a),b)

a) Shop foremen in a small shop department and sphere of responsibility with tasks requiring specialized occupational training or many years of professional experience.

b) Shop foremen having higher responsibility and more experience than those of Group M 2-a).

Group M 3-a),b)

a) Sole shop foremen in small company or plants and shop foremen in large production department with tasks requiring specialized occupational training or special knowledge and solid professional experience.

b) Shop foremen having higher responsibility than those of Group M 3-a) and having many years of comprehensive experience.

Group M 4-a),b)

a) Shop foremen with high degree of responsibility for a difficult field of duties and supervision; their activity requires prudence and tact in frequently changing tasks as well as organizing ability and a background of many years of activity as foreman. They frequently supervise foremen of other groups.

b) Shop foremen with task and qualifications as under Group M 4-a) who supervise as a rule several foremen (Chief Shop Formen).

6.2.2.3 Salary Code

Employer and employees agree on a base salary from which the standard salaries are worked out according to the following salary code. The base salary is in each case the salary of the clerk and technician of Group K 1 and T 1 respectively having reached the age of 21, such salary being paid for the first and the second year of employment.

Salary Code and Age Grouping

A. K and T Groups

	1	2		3		4	5		6	
		a)	b)	a)	b)		a)	b)	a)	b)
	%	%		%		%	%		%	
Up to the age of 18	87.5	90	95	105						
After the age of 18	95.0	100	105	110	117					
As of the age of 20: Years of employment in the Group:										
1st and 2nd year	100.0	115	126	133	148	178	213	232	260	280
3rd and 4th year	108.0	124	136	144	160	191	228	248	277	298
5th and 6th year	116.0	133	146	154	172	205	243	264		
7th and 8th year	124.0	143	156	165	184	218				
After 8th year	132.0	152	166	176	195					

For the advance within in the group of years of employment, the years of employment as of the age of 20 shall apply.

B. Shop Foremen

	M 1	M 2		M 3		M 4	
		a)	b)	a)	b)	a)	b)
	%	%		%		%	
Over 30 years old	170	200	220	240	260	270	290

For foremen below the age of 30 a deduction of 10% is made. Shop foremen in hot plants receive an addition of 6%.

6.2.2.4 Payment of Salaries

1. Salaries are paid cashless or in cash for the completed month.

2. Accounting period, due date of salary payment, eventual payments on account as well as kind of payment - in case of cash payment also the place - have to be agreed upon.

3. The employee is entitled to a statement of account showing the gross remuneration, its composition and computation as well as all deductions and eventual payments on account.

6.3 INCENTIVE SYSTEM
for Wage and Salary Earners

6.3.1 Introduction

The premium as a form of remuneration offers an opportunity to remunerate both productive (industrial production) and unproductive (indirect activities) operations related to performance. It is intended to give people an incentive to attain a higher standard of performance even though no direct interdependence exists between their performance and the result of their work.

The incentive system can be introduced as soon as data are processed in the Corporation which are representative and indicative as well as suitable as influencing factors (premium factors) for the computation of the premium. These data must cover a sufficiently long period: possibly one year, at least six months in order to be able to select and weight the most suitable influencing factors.

6.3.2 Composition of the Incentive

The incentive may consist of several parts. The basis is always the standard rate. Examples:

a)
Standard Rate (Incentive Base Rate)
+ Premium (Varying)
= Total Remuneration (Incentive Pay)

b)
Standard Rate
+ Bonus (Internally and Voluntary)
= Incentive Base Rate
+ Premium (Varying)
= Total Remuneration (Incentive Pay)

The incentive base rate is always a fixed amount while the premium itself can be varied at will. Normally it is proportional, but it may also be

progressive,
degressive,
gradual.

The amount of the premium must be such that it is remunerative and offers a real incentive to the person doing the work.

6.3.3 Influencing Factors (Premium Factors) and Premium Fixing

The influencing factors must be determined from the data existing in the Corporation, such as in cost accounting, sales, production planning and control, production, quality control. This results in the selection of premium factors such as

production output (quantity),
product grade (quality),
utilization of machinery and equipment (covering fixed costs),
consumption of auxiliary material (overhead portion),
need for tools and fixtures (overhead saving),
maintenance expenditure (influencing manufacturing cost),
time spent by the individual doing the work.

Regarding individual and group premiums it is advisable to start with group premiums.

In fixing the premium it is recommended to start with standards of comparison which are easy to determine in order to define premium coefficients, as for instance:

$$\text{Premium Coefficient} = \frac{\text{Quantity of Manufactured and Accepted Pieces}}{\text{Number of Hours Worked}}$$

$$\text{Premium Coefficient} = \frac{\text{Weight of Manufactured and Accepted Pieces}}{\text{Number of Hours Worked}}$$

$$\text{Premium Coefficient (for Quality Control)} = \frac{\text{Number of Deficiency Reports}}{\text{Number of Shipped Products}}$$

6.3.4 Premium Basis (Normal Values)

Premium basis is the incentive base rate. It corresponds to the "normal result". No premium is paid for this result.

From historical data values are to be selected which conform with the normal state. The correctness of these values is confirmed mostly by some exemplary computations. In many cases it turns out that the values have to be changed after the introduction (trial run), (as a rule in the upper direction).

An analysis of the result of exemplary computations permits conclusions as to the significance of normal values. The following may serve as rule of thumb.

1. If the computation shows that the premium of the previous period is too frequently in the upper range or reaches even the maximum, the result basis (normal values) was selected too low.

2. If the exemplary computation shows that the premium varies not at all or only slightly, the influencing factors are not sufficiently weighted. The premium fixing (formula) and perhaps the course of the premium curve have to be changed.

6.3.5 Introduction of the Incentive System

6.3.5.1 Preparation

- Fixing of the premium objective.
- Collection, screening and evaluation of available data.
- Determination of the premium factors (influencing factors).
- Decision on the amount of premium (monetary value) and on the course of the premium curve.
- Fixing of the premium basis (normal value = incentive base rate).
- Calculation of the system with historical values.
- Comparison of normal values with the result of the exemplary calculation.
- Elaboration of the incentive pay policy.

6.3.5.2 Information of Parties Concerned

The persons receiving incentive pay and their supervisers have to be informed thoroughly prior to the introduction of the system.

6.3.5.3 Trial Run

In the interest of employer and employees it is advisable to test the effectiveness and balance of the system by a trial run limited to about three months.

6.3.5.4 Definite Introduction

When the system has turned out to be a success during the trial run, a detailed premium policy will be elaborated and the definite introduction will be stated.