

Guide to production control —

Part 4: Dispatching (shop-floor control)

Committees responsible for this British Standard

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- British Computer Society
- British Production and Inventory Control Society
- Chartered Institute of Management Accountants
- EEA (the Association of Electronics, Telecommunications and Business Equipment Industries)
- Institute of Logistics and Distribution Management
- Ministry of Defence
- Nottingham University
- PERA International (Production Engineering Research Association)
- University of Bradford
- University of Manchester Institute of Science and Technology

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Foreword

This Part of BS 5192 has been prepared under the direction of the Quality, Management and Statistics Standards Committee.

The prime objective of production control is to help a company become more competitive and profitable. An effective production control function endeavours to fulfil this objective by keeping a balance between satisfying sales demand, achieving high plant utilization and maintaining low investment in stocks and work-in-progress. An optimum balance between these often conflicting objectives will only be achieved by a production control system designed to meet the specific needs of the company and run by well trained and dedicated staff.

BS 5192 is published in six Parts and gives comprehensive guidance in those areas that are considered essential for efficient production control. The Parts are as follows:

- *Part 1: Introduction: Scope of the guide, purpose of production control, relationship to other functions, technological changes, choosing the system to fit the business;*
- *Part 2: Production programming: Relationship to corporate and business programmes, planning techniques, master production scheduling, capacity planning;*
- *Part 3: Ordering methods: The various types of ordering and stock control systems, comparing the advantages of each for particular applications;*
- *Part 4: Dispatching (shop-floor control): The methods of shop-floor production control and documentation involved and the increasing influence of computers;*
- *Part 5: The relationship between production control and other management functions: The production control information flows in the organization, their generation, presentation, use and maintenance;*
- *Part 6: Computer aided production control: The application of computer software to the production control function.*

Throughout this standard use of the pronouns he, him and his is intended to be non-gender-specific.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

This Part of BS 5192 is intended to address the area of production control dealing with the control of actual workflow, movement of work through various workstations and operations in the manufacturing process.

1 Scope

This Part of BS 5192 gives guidance on the procedures and documentation used in production control and makes reference to the use of computers for this task.

2 References

2.1 Normative references

This Part of BS 5192 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 5192 only when incorporated in it by updating or revision.

2.2 Informative references

This Part of BS 5192 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this Part of BS 5192, the definitions given in BS 3138:1992, BS 5191:1975 and BS 5192-1:1993 apply.

4 Dispatching

4.1 Definition

Dispatching is the detailed allocation and subsequent control of production resources to individual work orders, necessary to complete orders in accordance with the production programme (see Figure 1).

4.2 Dispatching methods

Dispatching can be a simple or complex task depending on the layout and organization of the manufacturing process and on the information feedback requirements of the production control system in use.

In flowline production the operators normally carry out fixed, routine tasks to a constant specification and dispatching is simple.

In batch and jobbing production the number of variables increases substantially and with it the complexity of the dispatching system.

Manual dispatching methods can be highly successful, particularly in simple manufacturing environments. In complex environments, with large volumes of information, it is likely to be of benefit to use the dispatching facilities of a computerized production control system. Documentation can be quickly, accurately and automatically provided and information readily passed between users of the system.

4.3 The dispatcher

In small departments, the dispatching function is normally carried out by the foreman as part of his normal duties. In larger or more complex departments, especially those with a large variety of operations, a specialist dispatcher is necessary to carry out this function. The choice of dispatcher is also affected by the type of production control system in use, manual or computer and the volume and complexity of the information required for control of resources and feedback to the other parts of the system.

A computerized system can often eliminate the need for a specialist dispatcher by reducing the manual workload necessary for documentation.

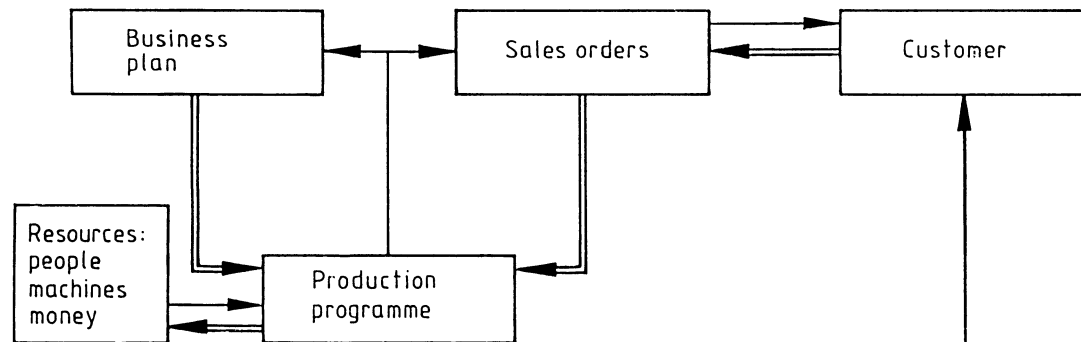
4.4 Control levels and time spans

The allocation and control of resources can be undertaken for time scales ranging from milliseconds to months ahead and to different depths of detail dependent on the purpose of the allocation and the level of control. Many levels of control may be present in a production control system dependent on the variety and complexity of the work centres and the degree of automation. A typical plant may employ four levels as follows.

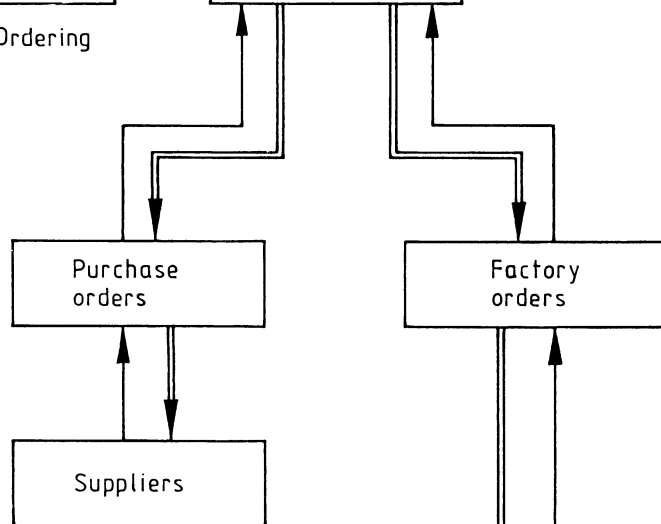
a) *Level four* is the strategic level where the manufacture of products or groups of products is allocated to a manufacturing plant or to units within a plant. Time scales will typically be from a week to in excess of a year ahead. For the allocation of production resources it is probable that only the resources that are scarce or whose cost has a major impact on final product costs will be taken into account and the finished products may be grouped. The end result is the master production schedule.

b) *Level three* is the level where the machines to be used in the unit to enable the operations to be performed on each batch of work are determined, where a choice is possible. The sequence in which the jobs will be released is also determined. Level three is the sequence control (or operational control) level and is the level where the process of dispatch is normally undertaken. The time span covered is typically from a shift to a week, the output being a work-to-list for each separately identifiable work centre.

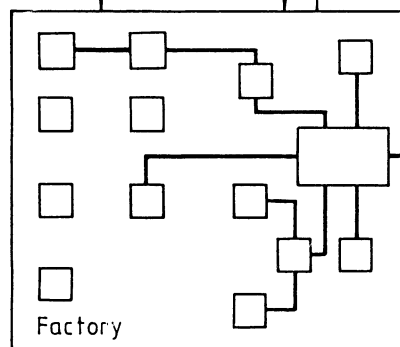
1) Programming



2) Ordering



3) Dispatching



==== Requirements
==== Feedback
—— Goods flow

Figure 1 — Stages of production control

NOTE In a machine shop with numerically controlled machines (possibly segregated into groups of similar machines) there may be the need for two further levels of control; level two, the cell control level and level one, the machine control level.

c) *Level two* contains dedicated processors, each controlling a number of machines within a cell. The cell controller receives the detailed programme from the sequence controller; loads the machine control software into the machine as it is required and receives back details of performance. It covers a time span of, for example, an hour to a shift and is the interface between the dispatching system at the workshop level and the machine controller.

d) *Level one* relates to the actual programmable controller attached to the machine, that controls the individual machine movements and initiates the necessary action when a sensor identifies that there is a malfunction.

5 Shop order documentation

5.1 Documentation used in manufacturing industry

This clause describes documentation typical to many batch and jobbing applications in manufacturing industry. More complex documentation than that described will only be practicable as part of a computerized system. In this case the information, in similar format, can be printed by the system or displayed on appropriately positioned visual display units (VDU). It is not uncommon for the majority of this information to be provided without the use of hard-copy documents. Similarly, feedback to the computerized system can be achieved by direct input from appropriately positioned terminals.

The process of dispatching is normally initiated by the issuing of a shop order set of documents (see Figure 2) that typically consists of the following.

a) *Route cards (travellers)*. A route card is a summary of all the operations that will be performed on a batch of work from the initial issuing of materials to the eventual inspection and receipt of finished goods, including details of the machines/work stations where the operations are to be carried out and tooling required for these machines. This information is obtained from the process planning sheet. The route card generally stays with the batch of work, being passed from stage to stage and annotated by supervisors/inspectors when appropriate. It is thus a record of the progress of a job and its current position.

The recording of inspection details may include first-off inspection for an operation (when the first component is inspected after the machine has been set up) and final inspection when the operation is complete. Where work fails inspection a decision should be taken and recorded as to the action to be taken. This will typically be authorizing the material as scrap; downgrading the material and transferring to another order; or authorizing rectification work to bring the material back up to standard. Where such rectification work is significant, it may result in the raising of a new works order.

In addition to the route card it may be helpful to raise a batch identification card that will remain with the batch throughout manufacture and into storage. This can assist stores to operate a first in, first out issue system.

Completed route cards can become part of the goods inward procedure, i.e. they can assist the booking in of goods into stores and stock records. They are then passed to the accounts section for batch costing and finally filed as archive records.

b) *Material requisition (stores requisition)*. The stores requisition is the list of materials required for manufacture. It is obtained from the bill of materials. A materials requisition is surrendered to stores in exchange for materials (and subsequently posted to stock records). For any parts or materials not available a shortage requisition should be raised.

c) *Operation cards (job cards)*. For each operation on the route card one operation card is created, containing quantitative details of the operation. These details are obtained from the process planning sheet. A simple operation card may list the following information:

- 1) works order reference;
- 2) batch quantity;
- 3) production method;
- 4) equipment to be used;
- 5) production aids required (jigs, fixtures, etc.);
- 6) standard time for the batch.

This card can be used as an instruction sheet for the operator(s) and should be fed back after completion of the operation, annotated with relevant information (quantity, time taken, etc.) as part of the monitoring process.