

BS 8210:2012



BSI Standards Publication

# Guide to facilities maintenance management

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## Foreword

### Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2012. It was prepared by Technical Committee FMW/1, *Facilities management*. A list of organizations represented on this committee can be obtained on request to its secretary.

### Supersession

This British Standard supersedes BS 8210:1986, which is withdrawn.

### Information about this document

This British Standard does not prescribe “how to do maintenance”, but acts as the basis of an approach for achieving successful maintenance outcomes for a range of facilities. It is intended to assist facility owners and operators, or those acting on their behalf, in regard to facilities maintenance management in aligning the formulation and implementation of maintenance strategies and policies to the core objectives of the organization in the most efficient and effective way.

This is a full revision of the standard, and introduces the following principal changes:

- the scope of this standard has shifted from largely operational matters to those of a more strategic and tactical nature, while retaining a focus on matters of practical importance;
- a broader range of facility assets has been taken into account;
- developments in technology affecting the nature of facility assets and the maintenance management process, in particular the use of information and communications technology (ICT), have been taken into account.

### Use of this document

As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

### Presentational conventions

The guidance in this standard is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

# 1 Scope

This British Standard gives guidance on the maintenance management of facilities by:

- a) outlining a process approach to maintenance management at the strategic and tactical levels, with links to operational activities;
- b) assisting organizations and individuals to formulate strategy and policies for maintenance management;
- c) assisting those responsible for ensuring that facility assets continue to perform as intended, retaining their asset value at minimum cost;
- d) highlighting the importance of regular and planned maintenance as a value adding activity;
- e) highlighting relevant areas of importance with regard to occupational health and safety and information management.

*NOTE It might be necessary and economically desirable to carry out maintenance at the same time as improvements, additions or alterations.*

This British Standard applies to most types of building-related facilities, for example, those for health care, education, housing, manufacturing and distribution, commerce, retailing, utilities, communication and transportation.

This British Standard does not give guidance on:

- 1) the procurement of services for maintenance (see BS 8572);
- 2) how to carry out different types of maintenance;
- 3) any improvements, additions or alterations to a facility that would make it suitable for a purpose other than that for which it was designed;
- 4) cleaning facilities (see BS 6270-3);
- 5) maintenance of engineering infrastructure.

# 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 7671, *Requirements for electrical installations – IET Wiring Regulations – Seventeenth Edition*

BS 8572, *Procurement of facility-related services – Guide*

# 3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

## 3.1 asset register

collection of records holding information about facility assets in terms of their manufacturer, vendor, make, model, specifications, date of acquisition, initial cost, maintenance costs and requirements, accumulated depreciation and written-down value

[BS 8587:2012, 3.1.3]

- 3.2 building fabric**  
elements and components of a building other than furniture and engineering installations
- 3.3 building management system (BMS)**  
computer-aided control systems, including hardware and software, to collect and monitor parameters and performance data of plant, equipment, systems and elements either at source or remotely and to enable corrective action to be initiated
- 3.4 building physicist**  
person with knowledge and experience of the behaviour and performance of buildings and their components under the influence of physical, chemical and biological phenomena
- 3.5 computer-aided facilities management system (CAFM)**  
systems, applications and tools that automate functions needed to support the core business in its efficient and effective use of facilities
- 3.6 computer-aided maintenance management system (CMMS)**  
system specifically designed to enable planning, organizing, directing and controlling maintenance programmes and to collect and collate historical data on the performance of assets so the most effective maintenance is selected under actual performance and environmental conditions
- 3.7 condition monitoring**  
act of measuring and recording data from operating parameters, using either human senses or instrumentation, to verify plant and equipment condition and trends
- 3.8 corrective maintenance**  
maintenance carried out after fault recognition and intended to put an item into a state in which it can perform a required function  
[BS EN 13306:2010, 7.5]
- 3.9 critical environment**  
area or location that, in the event of its non-availability, would have a significant negative impact upon business processes and activities
- 3.10 element**  
functional part of a building or other facility
- 3.11 facilities maintenance**  
work needed to maintain the performance of the building structure, fabric and components, and engineering installations
- 3.12 facility**  
tangible asset that supports an organization  
[BS EN 15221-1:2006, 2.6]
- 3.13 facility asset performance**  
requirements in terms of measurable outcomes to meeting organizational goals
- 3.14 maintenance management**  
process of ensuring that the most effective and efficient maintenance programme is formulated and delivered to ensure that assets continue to perform their intended function

- 3.15 maintenance manual**  
technical instructions intended to preserve an item in, or restore it to, a state in which it can perform a required function  
[BS EN 13460:2009, 5.3]
- 3.16 maintenance plan**  
structured and documented set of tasks that include the activities, procedures, resources and the time scale required to carry out maintenance  
[BS EN 13306:2010, 2.5]
- 3.17 maintenance policy**  
scope and course of action taken to achieve an organization's objectives  
*NOTE This can include requirements related to regulations and standards to be observed during maintenance.*
- 3.18 maintenance programme**  
arrangement of maintenance tasks in terms of their sequence, durations and resource requirements
- 3.19 maintenance strategy**  
statement of organizational approach to maintenance management
- 3.20 operational plan**  
organization's statement of actions intended to achieve a specific business goal(s)
- 3.21 planned preventive maintenance**  
maintenance organized and carried out with forethought, control and the use of records to a plan based on the results of condition surveys
- 3.22 reliability centred maintenance (RCM)**  
systems-based methodology used to determine maintenance tasks required to ensure that a facility asset or system continues to function in order to fulfil its purpose as designed in its present operating context

## 4 Facilities maintenance

### 4.1 General

#### COMMENTARY ON 4.1

*A well-defined facilities maintenance strategy supports the organization's goals, whereas, a poorly defined or absent strategy could have significant adverse safety and commercial consequences for an organization. The effectiveness of an organization to fulfil its environmental and social responsibility commitments and targets is also dependent upon an effective maintenance strategy. Since targets are subject to revision and are progressive, a static maintenance arrangement is unlikely to meet the developing needs of the organization. A review process is particularly important as changes, for example, to health and safety can impact the way in which maintenance is undertaken.*

An organization should formulate a facilities maintenance strategy and policy that meets its current and likely future needs. The strategy and policy should be reviewed, at least annually, to ensure that it continues to be aligned to the organization's core business and primary processes (see 8.1). An organization should ensure that the needs of its stakeholders are identified and the impact of those needs is assessed and taken into account when formulating the strategy and policy. A communication plan to disseminate the strategy and policy, as well as tactical and operational actions, to stakeholders should be prepared by the organization. Details of annual, or more frequent, reviews to check on the alignment between actions and the organization's facilities maintenance strategy should be included in the plan.

*NOTE 1 BS ISO 55001<sup>1)</sup> gives guidance of the high level approach to the maintenance of assets, including those related to constructed facilities. BS 8544<sup>1)</sup> provides guidance on the life cycle costing of maintenance.*

Where a new facility is being procured, the organization should ensure that operational requirements, including those concerning maintenance, are taken into account during design briefing.

*NOTE 2 BS 8536 gives recommendations on an appropriate approach for organizations and their designers.*

## 4.2 Maintenance strategy

*NOTE Facilities maintenance strategies can embody different methods of maintenance, e.g. corrective, preventive, condition-based or a combination of these and other methods (see Clause 6 and Annex A).*

The facilities maintenance strategy should define the criteria by which an appropriate method or combination of methods of maintenance can be assessed (see Clause 6 and Annex A). This strategy should form an integral part of the organization's facilities management strategy. Where no facilities management strategy exists, such a strategy should be prepared to support the organization's core business and primary processes (see BS EN 15221-5).

## 4.3 Maintenance policy

### 4.3.1 General

#### COMMENTARY ON 4.3.1

*Facility assets need to be maintained to ensure that:*

- a) they are suitable for their intended purpose;*
- b) they continue to perform their function throughout their useful life in a safe and efficient way;*
- c) their value is protected.*

*Ignoring maintenance risks the failure of systems and components and incurs needless additional cost, as well as threatening business continuity. Lack of maintenance can arise, in part, from a belief that a facility is a long-lived asset that deteriorates gradually. Even so, failure to maintain the structure and fabric can affect its function and presents safety risks in addition to reducing the value of the facility as an asset.*

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<sup>1)</sup> In preparation.

*Requirements for the health and safety of persons in and around a facility, coupled with the need to discharge the responsibilities of ownership, mean that an organization would benefit from adopting a proactive approach to its facilities maintenance management. The maintenance requirements of a facility are, to a large extent, a consequence of its original design and construction. Inefficient design, inappropriate specifications and poor quality work can result in faults that are subsequently difficult and expensive to diagnose and remedy. Inappropriate maintenance and repairs amount to unnecessary cost and inconvenience, which can be compounded by further attempts to remedy faults.*

A policy should be developed to support the preparation of operational plans in accordance with the maintenance strategy. The policy should outline the scope (see 4.3.2) and course(s) of action that should be taken to achieve an organization's goals (see 4.1). Organizations should ensure that suitable expertise is available for maintenance and its management at all levels within the organization. Where this expertise is not available in an organization, external resources should be employed instead. Persons responsible for managing the maintenance of facilities, including engineering installations, should possess appropriate management ability and technical competence.

#### 4.3.2 Scope of policy

The maintenance policy should embody the principle of best value for money (see BS 8572) to protect both the asset value and the resource value of the facility. The policy should cover:

- a) the organization's anticipated future requirements for the facility, taking into account the facility's physical performance and functional suitability, for example:
  - 1) the use of the facility, i.e. anticipating likely upgrades and the effect on the life cycles of existing materials, components and engineering installations;
  - 2) a change of use for the facility and the effect of any conversion work on the life cycles of existing materials, components and engineering installations;
  - 3) the anticipated date of conversion, renovation or refurbishment work;
- b) any cycles of maintenance determined in accordance with a);
- c) the method of maintenance, taking account of cycles of maintenance [see b)] together with the requirements of the organization with respect to the use of the facility and any special requirements to which this might give rise;
- d) holding spare parts and other items to replace those that are beyond repair or which have exceeded their useful life (see 9.7.6);
- e) the means for reporting on performance achieved.

#### 4.4 Permits and approvals

**NOTE 1** A permit-to-work is a formal system that states, in precise terms, the work to be done and when, and which parts of it are safe. A permit-to-work is a means of communication between site management, plant supervisors and operators, and those carrying out the work. It helps in coordinating different work activities to avoid conflicts. Guidance is given in HSE "Guidance on permit-to-work systems" [1]; while focusing on the petroleum, chemical and allied industries, it is still applicable.

An organization should determine the extent to which permits and approvals apply to maintenance work. A risk assessment should be carried out to determine the need for a safe system of work or permit-to-work. Safety should be checked at each stage.

*NOTE 2 This anticipates the likelihood of changes to normal operations over the lifetime of the facility as an organization responds to different business objectives and drivers.*

## 4.5 Procurement of maintenance-related services

### COMMENTARY ON 4.5

*One of the functions of maintenance management is to determine which procurement option, or combination of options, for the delivery of maintenance-related services best fits the core business and primary processes of an organization. It is important for organizations to understand the full maintenance requirements and the capability and capacity required to deliver these services.*

An organization should define its procedures on the procurement of maintenance-related services in accordance with BS 8572, collaborative business arrangements [see BS 11000 (both parts)] and the preparation of facility management agreements (see BS EN 15221-2).

# 5 Facilities maintenance planning

## 5.1 General

Maintenance plans should be driven by and support the intended outcomes stated in the facilities maintenance strategy and should be fully aligned with them.

Maintenance plans should be prepared in consultation with stakeholders, taking account of the following as a minimum:

- a) the organization's requirements for production and operational demands and constraints;
- b) the organization's financial circumstances and/or taxation position;
- c) feedback data on maintenance outcomes, including associated costs.

*NOTE An organization might find it beneficial to implement an annual programme of maintenance that takes into account climate, seasonal changes and conditions, physical environment, business continuity and occupant requirements.*

Multi-year programmes of maintenance should be put in place where appropriate, i.e. for long-term planning, finance or other expediency. Programmes should state a review date for assessing progress and performance (see Clause 8).

When formulating maintenance plans, a number of maintenance methods should be evaluated (see Clause 6). The links between the selected maintenance method(s), maintenance performance, facility asset performance and service delivery (see Clause 8) should be established through metrics, e.g. key performance indicators (KPIs), based on a practical and effective maintenance process.

## 5.2 Assessment of maintenance planning

An organization should assess the benefits of maintenance planning, basing the assessment on the following:

- a) its contribution to the organization's goals;
- b) the satisfaction of stakeholder interests;
- c) the effectiveness of the facility in supporting the organization's operational plans;
- d) the availability and reliability of the facility at minimal cost;

- e) capital and tax planning;
- f) asset management strategy;
- g) the protection of the value of facility assets;
- h) the provision of data on facility asset performance;
- i) the provision of data for maintenance benchmarking;
- j) the provision of data for continual process improvement;
- k) the provision of data on environmental performance;
- l) the basis for service life planning (see BS ISO 15686-1 and BS ISO 15686-2);
- m) the contribution to energy management;
- n) the contribution to business continuity management (see BS 25999-1:2006);
- o) the basis for service level agreements;
- p) the transparency and sound governance in financial reporting;
- q) the identified security risks;
- r) the awareness environmental sustainability;
- s) the improvement of outsourcing and collaboration agreements;
- t) the contribution to the facilities management strategy;
- u) the contribution to total quality management;
- v) the contribution to procurement and supply chain management.

### 5.3 Service life planning

Maintenance plans should be devised to ensure that the service life of facility assets matches or, where desirable, exceeds their design life.

*NOTE Further guidance on service life planning is given in BS ISO 15686-1 and BS ISO 15686-10.*

### 5.4 Facility assets and maintenance resources

A facility, and the individual assets that it comprises, should be maintained to deliver the most effective outcomes in terms of minimal cost and risk. Assets should be classified into risk categories, e.g. small, medium, severe and critical, according to their potential impact on the core business of the organization in the event of failure in performance. The condition of assets should be determined and a decision made as to the most effective option for their maintenance (see Clause 6).

A maintenance resource plan should be prepared for assets operating under normal (operating) conditions. This plan should be modified, where necessary, to reflect operating conditions within the facility that fall outside specified design requirements and/or tolerances. The plan should be capable of aligning with changes in demand for, or modes of, service delivery. For an existing facility, a condition assessment of the assets should be undertaken before preparing the maintenance resource plan, wherever practicable. The cost of implementing the plan should be estimated and adequate provision made within budgets. Once implemented, the plan should be monitored for effectiveness and performance, with adjustments made where appropriate to ensure that the requirements set out are met.

*NOTE 1 Where the condition of the facility is unknown or incomplete, one option for the organization might be to implement condition-based maintenance (see Annex A).*

An organization should align its service needs, including service dependency, utilization, location, capacity and functionality, and maintenance planning with the required level of facility asset performance. Where a new facility is being procured, an organization should ensure that adequate provision is made during the design and construction phases to incorporate these requirements.

*NOTE 2 BS 8536 gives recommendations on an appropriate approach for organizations and their designers.*

Maintenance should be planned to take account of the maintenance cycle of each element/sub-element and inspections should be made at regular intervals (as determined by the properties of each element/sub-element and its anticipated service life). An organization's production and operational requirements should be integrated into the maintenance plan. Annual programmes of maintenance should take into account subsequent years' programmes so that additional costs or abortive works are minimized. Decisions to replace or repair components should be taken after due consideration of whole-life costs.

*NOTE 3 BS 8544<sup>2)</sup> provides guidance on the life cycle costing of maintenance.*

## 5.5 Maintenance planning process

Maintenance planning should be carried out as follows (see Figure 1):

- 1) the facility assets required to support the core business and the delivery of services should be defined;
- 2) the required level of facility asset performance, including performance indicators, should be agreed;
- 3) the condition and sufficiency of facility assets for their intended purpose should be audited;
- 4) the scope of the maintenance required should be identified through gap analysis;
- 5) an appropriate maintenance method from those available should be selected;
- 6) the resources required for the chosen maintenance method should be assessed;
- 7) maintenance plans and budgets should be prepared to cover the required scope of services over the short, medium and long term;
- 8) a tactical plan for delivery of maintenance should be formulated;
- 9) the resources to deliver the scope of maintenance should be provided;
- 10) maintenance plans and programmes of work should be implemented;
- 11) performance monitoring, review and control of maintenance plans and programmes of work should be carried out.

Information and data gathered from this process should be used to re-inform the organization's need for, and use of, facility assets during this, and any future iterations, of this process.

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<sup>2)</sup> In preparation.