BRITISH STANDARD

BS EN 13460:2009

Maintenance — Documentation for maintenance

ICS 01.110; 03.080.10

National foreword

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The UK participation in its preparation was entrusted to Technical Committee DS/1, Dependability and terotechnology.

A list of organizations represented on this committee can be obtained on request to its secretary.

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

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Contents

Foreword

This document (EN 13460:2009) has been prepared by Technical Committee CEN/TC 319 “Maintenance”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2009, and conflicting national standards shall be withdrawn at the latest by October 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13460:2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Maintenance, as any other function in business, requires a suitable information flow between the different points of its internal organization and with the rest of the functional and organizational units of the business, in order to fulfil its objectives of reaching an acceptable performance.

For the purpose of this European Standard, it is necessary to consider that the different companies organize their functions and divisions according to their specific needs (traditions, market, means, human resources, etc.). Therefore, the organization of the information varies from one business to another. For that reason, this European Standard has been divided into a normative part and informative annexes.

The normative part concerns the first part of the life cycle of the item to be maintained, namely the preparatory phase. When an item is acquired, the acquirer requires certain documentation to maintain and operate the item properly. That appropriate documentation has to be provided by the supplier of the item.

The normative part of this European Standard describes the list of required essential documents for maintenance and gives information on possible contents of each document mentioned in Clause 5. In order to make the standard flexible to the specific needs of user/supplier of the item, the list of information given for each document may be adapted to specific requirements by agreement between user and supplier. This European Standard takes into consideration agreements between parties which affect documentation in such a way that any document may be deleted or replaced totally or partially as agreed in the contract according to EN 13269:2006.

The informative annexes A, B and C concern the operational phase (see 3.6) of the life cycle of the item to be maintained.

The informative annexes, in addition to the normative text, develop the documentation for maintenance having regard to the maintenance function as a part of the quality system of the company. That is, not only the documentation of information which is necessary to manage the maintenance is suggested, but also the documentation to accomplish, at the same time, the quality assurance requirements for maintenance operations.

NOTE Maintenance documents for very large or complex items (e.g. radar systems or nuclear plants) can require a careful and very specific approach that can be significantly different and cannot be faced in detail in this standard.

1 Scope

This European Standard specifies general guidelines for:

— the technical documentation to be supplied with an item, at the latest before it is ready to be put into service, in order to support its maintenance, see Clause 5.

— the documentation of information to be established within the operational phase of an item, in order to support the maintenance requirements, see Annex A.

It is mainly addressed to designers, manufacturers, technical writers and suppliers of documentation.

This standard does not include documents related to training and competences of users, operators and maintenance staff.

This standard may not be applicable to the documentation for the maintenance of software only.

2 Normative references

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

EN 13269, *Maintenance — Guideline on preparation of maintenance contracts*

EN 13306:2001, *Maintenance terminology*

EN 60300-3-14:2004, *Dependability management — Part 3-14: Application guide —Maintenance and maintenance support (IEC 60300-3-14:2004)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13306:2001, together with the following apply.

3.1
assets register (equipment basic data)
item (see 3.4) basic information, related to technical, contractual, administrative, locational and operational aspects, in order to define it within the company

NOTE This information comes either from the preparatory or the operational phase (see 3.7 and 3.6).

3.2
document
specific form containing information

3.3
documentation
information given in a specific form

3.4
item
any part, component, device, subsystem, functional unit, equipment or system that can be individually considered [EN 13306:2001]

3.5
maintenance workflow
set of sequenced steps to be followed, in order to accomplish a maintenance operation, from the first preparatory activities, such as study and defining policies, to the analysis once the work is finished and action to be taken to improve future similar cases (see Figure C.1)

3.6
operational phase
period of time beginning when the item is put into service and ending with the disposal of the item

3.7
preparatory phase
period in the item life time corresponding to the conception, designing, manufacturing, assembly and commissioning of the item

3.8
work order (W.O.)
document containing all the information related to a maintenance operation and the reference links to other documents necessary to carry out the maintenance work

4 Documentation

4.1 General

The requirements of 7.4.2 of EN 60300-3-14:2004 apply as guidance.

4.2 The concept of document

The document is the physical support of the information in a specific form. This may take the form of a paper sheet, the screen of a video monitor of a computer system, an electronic board, a blackboard, etc. and the figures, type, size and distribution on the available surface may vary without affecting the main purpose of the information system. It is absolutely important to ensure that the necessary set of information items is available at the right point, to the appropriate person, in the necessary time, whatever the means the company is using.

NOTE A document is permanent. Program results displayed on a screen do not make any document unless it is stored. Document can be information stored in a database which can be shown on a screen or printed out.

Due to these reasons, the information items have been described in detail and grouped in information structures of higher level. These structures will constitute the content of a specific document, once it has been displayed in a certain way, in a specific form.

This European Standard deals with the kind of documents and their specific content in detail. However, it does not standardize the physical aspect either of the documents or of their contents. Therefore, for the purpose of this standard, the structures of information items are called documents, although they are, in fact, the information contents of those documents.

4.3 Normative documentation for maintenance

This European Standard lists and defines the whole set of documents and information to be considered in the acquisition of any installation, equipment, system or subsystem in order to make it possible to organize its maintenance. When the item is ordered from the supplier, those documents and information will have the consideration of an implicit or explicit part of the order. The supplier only shall issue those documents that are related to the service or function which are expected to be covered by the supplied item and are under the responsibility of the supplier. These are declared indirectly in the features contracted between the supplier and the user of the item.

NOTE 1 Not all the documents listed in Clause 5 have to be present in the document set supplied with the physical item. For instance, “lubrication map” has no meaning related to a lubrication-free equipment. Another example: the supplier of the civil engineering work, in the erection of an industrial plant, normally has nothing to do with the "logic diagram".

In any case, the supplier may provide more documents than listed in this standard, as additional information or by agreement with the client.

In order to define the above mentioned documentation accurately, Clause 5 gives a table containing the documentation profile. The table is structured in four columns.

The column “Document name” contains the title given to each particular document.

The column “Document description” contains a brief explanation of each document content, as a definition of it.

The column “Information” contains the minimum set of elements of information to be included in each document. If each document is considered as a data structure in a database, the information items will be the different fields.

NOTE 2 There is no requirement specified for the size of each information, nor for the type of its literary content (alphabetical, numerical, alphanumerically, etc.). This means that the information should meet the detailed needs of each user or supplier (for instance, it is not possible to standardize the codification, the units of capacity, the type of supplies required, etc.).

In particular cases, some of the information listed for a document should not be used because of their lack of relevance or the nature of the item to which it is related. In those cases, the corresponding information should be completed with the expression "not relevant" or "not applicable", whichever is more suitable.

The supplier and purchaser of an item may define, if required in the purchase agreement, the complete list of detailed information, as well as the presentation format and media.

5 Documents from the preparatory phase

	Document name	Document description	Information
5.1	**Technical data**	Manufacturer's specification of the item.	Manufacturer Date of manufacture Model/type/serial number Size Weight Capacity Power and service requirements Interfaces specifications Other: referring physical nature, assembly details and operation data
5.2	**Operation manual**	Technical instructions to reach a proper item function performance according to its technical specifications and safety conditions.	Model/type Manual date (edition) Technical details of the item Functional description of the item Functional capabilities and performances Design, safety and operation margin Procedures for: — commissioning / start-up — warning-up — steady operation — controlled shutdown — incidental and emergency Operation limitations/Precautions Laws and regulations to be abided to
5.3	**Maintenance manuals**	Technical instructions intended to preserve an item in, or restore it to, a state in which it can perform a required function.	Model/type Manual date (edition) Technical details of the item Preventive maintenance operations/actions: — inspections — calibration/adjustment — parts replacements — lubrication Procedures for: — troubleshooting — dismantling/assembly — repair — adjustment Cause and effect diagrams Special tools required Spare parts recommendations Safety requirements (signals, dressing, power source control, etc.)
5.4	**Components list and spare parts list**	Comprehensive list of items which constitute part of another one.	Equipment breakdown description Upper level item (heading) (Model/type/serial number) Item number Item description Item quantity

	Document name	Document description	Information
5.5	**Arrangements**	Drawing showing replacement components layout for an item.	Drawing code and identification Date (issue/revision) Dimensions Item components location and identification Necessary space for disassembly and maintenance Relevant information about connection details When necessary: lifting lugs, inspection hatches, ladders, etc.
5.6	**Detail**	Drawing with part list to ensure dismantling, repair and assembly of items.	Code identifying the item which is detailed Assembly drawing showing positions of parts Identification of each part on the drawing: — part number — description — number of units Any other relevant information for assembly and disassembly operations
5.7	**Lubrication map**	Drawing showing position of each item lubrication point, with lubrication data and specifications.	Map code and identification Date (issue/revision) Item identification (code and name) Lubrication point position (drawing) Lubrication point identification Lubrication point description Lubricant specifications Routing, when necessary
5.8	**Single line diagram**	Overall power distribution diagram: — electrical; — pneumatic; — hydraulic. This kind of diagram includes switchboard circuits.	Diagram code and identification Date (issue/revision) Power distribution units (generators, transformers, switch gears, rectifiers, etc.) End consumers (for high voltage switchgears only) Earthing lines for systems, equipment and cables (general earthing principles will be included)
5.9	**Logic diagram**	System control diagram to clarify the overall system logic.	Diagram code and identification Date (issue/revision) Logic functions (symbols, internetworking and control flow) Modes of operation (e.g. starting, shutdown, alarm, trip functions)
5.10	**Circuit diagram**	Overall feeder and control circuits diagram.	Diagram code and identification Date (issue/revision) All internal connections for control, alarms, protection, interlocks, trip functions, monitoring, etc. Settings of timers, thermal overload and protection relays Wire and cable numbers Terminal numbers Component list for in line, control and protection systems Switch gear/board location code Consumer/supplier location code Termination details and type of external signal (fire and gas trip signal, etc.) Power and current rating Reference drawings

	Document name	Document description	Information
5.11	**Pipe and instrument diagram**	Overall fluid conduction (air, steam, oil, fuel, etc.) and control diagram.	Diagram code and identification Date (issue/revision) All internal connections for control, alarms, protection, interlocks, trip functions, monitoring, etc. Pipe numbers Valves location code Terminal numbers Component list for in line control and protection systems Consumer/supplier location code Termination details and type of external signal (colour, fire and gas trip signal, etc.) Pressure, flow and temperature rating Reference drawings
5.12	**Location**	Drawing showing the position of all field items within the considered area.	Drawing code and identification Date (issue/revision) Area identification (code and name) Item identification and location code Items drawings or symbols, without dimensional details
5.13	**Layout**	Drawing showing all areas of a particular plant.	Drawing code and identification Date (issue/revision) Plant name (and code, when necessary) Areas: relative position, dimensions, names and codes
5.14	**Test program report**	Commissioning report which demonstrates that an item is in compliance with specifications.	Manufacturer Model / type / serial number Date of manufacture Date of commissioning Warranty period and conditions Fulfilment of the technical details: — size (when required) — weight (when required) — power and Service Requirements (inputs) — capacity/performance (output) — other: referring physical nature, assembly details and operation data Name and signature of the end user of the item, accepting previous data
5.15	**Certificates**	Specific safety and statutory regulations certificates for items (lifting equipment, steam boilers, pressure vessels, etc.).	Manufacturer Model/type/serial number Date of manufacture Subject to be certified Date of certificate Certification body/office and signature/stamp

Annex A
(informative)

Documents from the operational phase

	Document name	Document description	Information
A.1	**Document index**	Relevant aspects concerning the issue of each maintenance document.	Document number Document title Document originator (design, manufacturer, assembly line, operation, maintenance, etc.) Document format (paper, magnetic, electronic, etc.) Revision data (date and level) Item location code (cross-reference)
A.2	**Assets register (Equipment basic data)**	Item basic information coming from either the preparatory or the operational phase. This information is related to technical, contractual, administrative, locational and operational aspects of an item, in order to define it within the company.	Location code (sometimes production oriented location code is required separately) Item name Acquisition price of the item Manufacturer Model/type/serial number Date of manufacture Date of installation Warranty period Accounting number for cost charging Responsible maintenance department Standard estimated maintenance time (preventive and corrective) Family (in case of comparisons among similar items) Opportunity cost/production loss cost Basic item maintenance data: — Direct Maintenance Cost — Lost Production Cost — MTBF,MTTR, etc. — availability and use — criticality Other: cross-references to technical documentation, spare-part list, etc.
A.3	**Item history record of maintenance operations**	List of work orders of a particular item. The list will be for a given period of time.	Item code and name Date (issue) Period of time analyzed (since/to) List of work orders chronologically ordered including: — number — date — complaint/cause — failing part — running hours of the item — registration/open/closure dates — cost of job covered by the work order
A.4	**Work order**	Main document to release, to follow and to manage each maintenance operation.	See Annex B (informative)

	Document name	Document description	Information
A.5	**Spare parts cross-reference list**	Catalogue of spare parts and articles stored and/or needed.	Article code Name Description Stock location Main supplier Lead time Price Unit of measure Unit of purchase Minimum level Order quantity Supplier article code
A.6	**Cause and effect diagram**	Diagram showing, by order of importance, the different causes which produce a given effect (failure).	Effect description and code Analyzed item/s code/population: model/type/ serial number/location codes Diagram date (issue date) Period of time analyzed (since/to) List of causes in descendent order, including for each cause: — cause code — cause description — relative cause importance % (in cost, downtime, number of failures, etc.) — total importance (cost or downtime or number of failures produced, etc.)
A.7	**Parameter history record**	Set of values given by any item inspected/ monitored parameter during a certain period of time.	Item code and name Parameter description and measure units Measurement point identification Date (issue) Period of time analyzed (since/to) For each record: — time — parameter value — measurement point identification Cross-reference to technical procedure (when required)
A.8	**MTBF-MTTR control chart**	Statistical information document. Contains the referred values for items considered of major interest	Item code and Identification Date(issue) Cause of failure analyzed and code MTTR — MTBF
A.9	**Planning sheet**	List of work orders according to a given priority	Date (issue) Item code and identification Planning period (from/to) List of work orders sorted including: — number — expected date — complaint/cause[1] — item (lower level)

1 Here, the description of the work should be included in the case of systematic maintenance.

	Document name	Document description	Information
A.10	**Scheduling sheet**	Work orders planning and time schedule assignment for a given period. It is obtained by assigning the available resources to the work orders backlog.	Date (issue) Item code and identification Planning period (since/to) List of work orders sorted including: — number — start date — due time — complaint/cause[1] — item (lower level) — resources required by the work order
A.11	**Production planning**	Planning of the use of production resources (installations, personnel), defining availability window for maintenance operations implying complete or partial shutdown.	Annual production program Monthly production program Weekly/daily production program
A.12	**Item availability and use data sheet**	Document which shows how the item availability is used.	Item code Identification Date(issue) Period (since/to) Scheduled time, downtime, uptime, availability Time of item use
A.13	**Personnel history record**	List of all activities (work order) carried out by a technician. This list will cover a given period of time.	Technician name and code Date (issue) Period of time analyzed (since/to) List of work orders chronologically sorted including: — number — date — complaint/cause — working hours of technician
A.14	**Other resources history record**	List of all activities (work order) in which a resource has been used. This list will cover a given period of time.	Resource code and name Date (issue) Period of time analyzed (since/to) List of work orders chronologically sorted including: — number — date — complaint/cause — amount of resource employed
A.15	**Maintenance cost history record**	Maintenance expenses classified according to the maintenance and business cost structure, for a given period of time.	Date issued Period of time analyzed (since/to) Cost structure element
A.16	**Company organization diagram**	Graphical illustration of the company units (functional or / and divisional), showing the flow of formal authority	Date (issue/revision) Name of the company organizational unit Main interdependence among units Responsible person (optional)
A.17	**Management reviews of maintenance quality goals and policies**	Manual of the company's maintenance quality policy and system	General policy Governing principles Organization and responsibility Elements of the maintenance quality system List of quality-relevant documents

	Document name	Document description	Information
A.18	**Procedure for maintenance contract and their amendments**	Checklist of points to be verified when reviewing a contract.	Company's contracting policy. List of specific points to be checked for all contract chapters indicated in A.19. See EN 13269.
A.19	**Maintenance contracts and their amendments**	Set of updated maintenance contracts in force, including amendments.	According to EN 13269.
A.20	**Procedure to review causes of critical failures**	Instructions regarding the periodic review of causes for critical failures.	History recording of critical failures per machine/element (item) Failure cost Causes of failure (see IEC 60050(191)) Work carried out Distribution list of results
A.21	**Procedures to evaluate maintenance operations time for critical failures (MTTR, MTBF)**	Description of work measurement techniques to be used.	History recording of critical failures per machine/element (item). Time between failures Time to repair each failure
A.22	**Procedure to control maintenance documents and data.**	Check list of points to be verified when reviewing/updating maintenance documents and data.	List of available maintenance documents Periodicity of review/update List of points to be verified
A.23	**Maintenance information system user privileges**	List of maintenance information system users, their functions and their access levels.	User's name User's function Authorisation access code number and level
A.24	**Maintenance information system manual.**	Guide and instructions to properly operate the maintenance information system and authorized access levels to the maintenance information system.	Functions, operations and procedures to be followed List of system error Access level code List of authorised operations
A.25	**Acceptable maintenance suppliers**	List of qualified maintenance suppliers.	Address Ownership Size Occupancy Financial Situation References Expertise Proximity Appraisal
A.26	**Procedure for maintenance suppliers evaluation**	Check list for investigating/evaluating maintenance suppliers.	Ownership Years established Size Turn over Staff strength Equipment and facilities Occupancy degree Financial situation Contract forms References Expertise Appraisal Proximity

	Document name	Document description	Information
A.27	**Procedure to issue maintenance items purchase orders**	Instructions for technical purchasing.	Definitions Purchase requisitions Offer requests Offer selection Purchase orders Technical and general specifications Commercial and legal terms Payment conditions Cost control Standards applied
A.28	**Maintenance items purchase orders**	Written request to make or supply maintenance items.	Order number Date For each maintenance item: — item code — item description/specifications — quantity — price Destination (store or direct use) Lead time Commercial terms
A.29	**Procedure to verify purchased items**	List of criteria to be checked and specification of the verification procedure.	Purchase orders Supplier's catalogue Machine card Maintenance instructions Catalogue of articles stored
A.30	**Purchased items verifications**	Receiving report (e.g. copy of purchase order).	Item code Date of entry Quantity received Condition of items
A.31	**Procedure to control customer supplied items**	List of criteria to be checked and specification of the verification procedure.	Purchase orders Supplier's catalogue Machine card Maintenance instructions Catalogue of articles stored
A.32	**Customer supplied products status**	Internal written request to control maintenance items supplied by the customer.	Order number Date For each item: — item code — description — specifications — quantity — estimated cost Destination of items Delivery time
A.33	**Procedure for items identification.**	Guidelines for item codification, plant location codification and how to link the item code and the plant location code.	Item code format Location code format Item — location code format Store/installation location Supplier's catalogue cross reference format
A.34	**Procedure for traceability**	Guidelines for recording the different locations of an item in the plant, during the time.	Format of the record of item-location code and dates and management of those records

	Document name	Document description	Information
A.35	**Procedure to control maintenance activities**	List and form of maintenance reports	Elements for planning maintenance activities, among others: Priority assessment backlog Schedule compliance Labour efficiency Material cost Percent downtime maintenance cost Recommendations and action plan
A.36	**Procedure for a generic maintenance activity**	Guidelines for carrying out a generic maintenance activity.	Nature and sequence of subactivities Precautions to be taken Means Tools and resources required Objective to be met
A.37	**Procedures for carrying out the critical maintenance activities**	Guidelines for carrying out specific maintenance activities with direct impact on the production means.	Nature and sequence of subactivities Precautions to be taken Means Tools and resources required Objective to be met
A.38	**Procedure for items monitoring and testing (during downtime and operation)**	Guidelines for carrying out monitoring and testing.	Nature and sequence of subactivities Precautions to be taken Means Tools and resources required Objective to be met
A.39	**Unverified incoming items for urgent maintenance**	Register of incoming items for direct use.	Order number/work order Date of arrival Supplier Requesting department Date of issue For each item: — item code — designation
A.40	**Procedure to calibrate critical test equipment**	Guidelines for instruments calibration.	Nature and sequence of subactivities Precautions to be taken Means Tools and resources required Objective to be met
A.41	**Procedure to identify the test equipment affecting production mean effectiveness (critical test equipment)**	Guidelines for analysing root causes of effectiveness abatement in critical test equipment.	Nature and sequence of subactivities Precautions to be taken Means Tools and resources required Objective to be met
A.42	**Critical test equipment calibration records**	Register of calibration of instruments that shows the status of a production mean, especially the critical ones.	Test equipment code number Date and time Calibration data Calibration record number

	Document name	Document description	Information
A.43	**Procedure to identify, document,.etc, product non-conforming conditions due to maintenance**	Production line document recording non-conforming conditions due to maintenance.	Report to the maintenance function containing: Week number Day Nominal rate Actual rate Evolution of daily production Unplanned down time Down state codes Actions taken Planned downtime Uptime Amount of rework Amount of product first time well done
A.44	**Procedure for preventive and corrective actions**	Maintenance instructions describing preventive and corrective actions to be undertaken.	Item number and name Location Maintenance work description Responsibility/trade Standard man-hours required
A.45	**Procedures for handling, storing, packing, preservation and delivery**	Instruction for the organization of the technical store.	Physical and administrative organization of the store Entries Withdrawals and re-ordering of material Storage conditions for delicate, perishable, inflammable and polluting materials
A.46	**Maintenance records control**	Logbook of all records.	Record maintained History (date of event and description) of important observations and maintenance job performed
A.47	**Procedures for planning and implementing internal maintenance audits**	Instruction for the implementation of maintenance audits.	Scope of validity Objectives Planning and execution phases Executants Analysis Report and action plan Follow up
A.48	**Internal maintenance audits**	List of criteria to be checked indicating the minimum performance required and results obtained.	Priority assessment backlog Schedule compliance Labour efficiency Material cost Percent downtime maintenance cost Recommendations and action plan
A.49	**Procedure to follow - up internal audit corrective actions**	Action plans with periodic progress review.	Action to be taken on the basis of observations or audits in the field of equipment, buildings, tools and vehicles Organisation (strategy, methods, systems, standards) Guidelines (maintenance type / category, product liability /quality, protection of health and labour, item safeguarding, environmental protection)
A.50	**Procedure to identify training requirements**	Action plan with periodic progress review.	Actions to be taken on the basis of observations and/or audits in the field of personnel training
A.51	**Personnel skill and training file**	Personnel data sheet	Basic education Career history Training programs Specific knowledge Official proof of skills

	Document name	Document description	Information
A.52	**Procedure to control, verify and reporting supplied servicing affecting maintenance activities**	Evaluation check list.	Servicing contract List of items to be inspected Performance expected under production conditions
A.53	**Servicing supplied for maintenance**	Final and/or intermediate progress report on supplied services.	Cost Job progress Change orders Work acceptance Suggestions for improvements
A.54	**Procedure to control the application of statistical techniques.**	Guidelines for statistical control.	Nature and sequence of subactivities Precautions to be taken Means Tools and resources required Objective to be met
A.55	**Laws and regulations abiding procedures**	Guidelines to laws and regulations abiding procedures	Laws and/or regulation reference Relevant issues Responsibility What to do, when, where

Annex B
(informative)

Work order information items

Table B.1 — Work order (W.O.) information

Work order information	Information description
B.1 Number	Code assigned to a W.O. This code is unique for each W.O.
B.2 Petitioner	Name of the authorized person requesting the maintenance service.
B.3 Registration date	Date when the W.O. is issued.
B.4 Open date	Date when the W.O. is activated.
B.5 Close date	Date when the W.O. is completed. The corresponding work is finished.
B.6 Item code	Code assigned to the item within the physical structure of the plant. This code is unique for each piece of equipment.
B.7 Item location	Code corresponding to the geographical location of the item within the plant. It is normally attached to or is included in the item code.
B.8 Item running hours	Parameter by means of which, the utilization of the item can be recorded. The parameter can be different, such as number of operations, pieces, natural calendar.
B.9 Type of maintenance	Code referring to the nature of the maintenance activity (for example preventive, electrical, new installation, etc.). Usually, it is linked to the cost structure.
B.10 Priority	Code to give information about the necessary precedence among the W.O.s for its activation. Priority has in some cases to do with criticality.
B.11 Safety and environmental regulations	Link to the possible safety and environmental requirements to perform the maintenance work, either mandatory or recommendations.
B.12 Retention justification	The reason why an open W.O. is not running at the moment. Downtime for each retention should also be included.
B.13 Frequency	Time between maintenance services within cyclic operations.
B.14 Last operation time	Last date when a particular cyclic maintenance operation was performed.
B.15 Resources estimation	Amount of the different resources intended to be used to accomplish the W.O. in a cyclic operation.
B.16 Check list	Relation of points to inspect within a cyclic maintenance operation. Normally these should be first line maintenance activities.

Table B.1 *(continued)*

Work order information	Information description
B.17 Complaint	Reason why a W.O. is issued. Symptom of the failure, normally detected by the user of the item.
B.18 Failing part	Malfunctioned component of the item. The repair or substitution of this part in addition to the description of the actuation is the solution of the problem.
B.19 Cause of failure	Reason which determined the failure of the part, according to the maintenance technician criteria.
B.20 Technical procedure code	Link to the technical documentation which holds the information about the right actuation way. Tools required should be also included in that documentation.
B.21 Actuation description	Explanation of the carried out operations.
B.22 Labour amount	Working hours spent in carrying out the W.O; the sort of hours: normal, shift, night, extra, etc. should be specified.
B.23 Labour type	Personnel category or skills of those who carried out the W.O.
B.24 Personnel	List of all maintenance workers, who participated in carrying out the W.O.
B.25 Spare-parts reference	Code list of all spare-parts used within the W.O.
B.26 Spare-parts amount	Number of each spare-part type used within the W.O.
B.27 External labour	In the case of a contract with an external supplier of service for the W.O., list of all external workers, who participated in carrying out the W.O.
B.28 External spare-parts	In the case of a contract with an external supplier of service for the W.O., code list of all spare-parts used within the W.O.
B.29 Other external services	Services description, in the case of a contract with an external supplier of service for the W.O.
B.30 Acceptance	Maintenance work reception.

Annex C
(informative)

General overview of structure and purpose of documents

This European Standard provides a list that defines the adequate set of documents that support the information needed to perform the different tasks involved in the maintenance function and its relation with the rest of the organization areas. The set of documents also includes those required for the maintenance quality system.

To find out the kind of information necessary to perform the maintenance activities, first of all, all the tasks have to be studied in detail. The Industrial Maintenance Department can be considered, either as a part of an organization, or as a whole business, which sells its services to other companies. Going deeper into this information, it is possible to distinguish the elements of information, usually called information items which are the smallest amounts of information which have a meaning for someone in the system, e.g. a field of a record in an electronic file, an item on a bill.

This information is, in some cases, absolutely necessary for the people in charge of a task, in order that they can perform it. In other cases, it provides the way to coordinate the maintenance tasks, maintenance management functions, strategic planning and the mean to measure, control and improve the function. In order to define the information minimum requirements of the system, the maintenance activities have been analysed, from the item and maintenance operations lifecycles viewpoints. In this work, the documentation used in many European companies and even some draft standards coming from certain areas of production, have been consulted. This standard considers the maintenance function as a part of the quality system of the company.

In order to fulfil the quality system requirements, as specified in EN ISO 9001, this European Standard contains, among other documents, the appropriate records and procedures (see Annex A) to be kept and maintained within the maintenance organization.

The starting point of the analysis carried out to obtain the required documentation of information for maintenance, is the “Maintenance workflow” (see Figure C.1).

The correct fulfilment of each one of the maintenance workflow steps requires the supply of certain information, contained in the INPUT DOCUMENTS (see Figure C.2). Each step of the maintenance workflow generates information, contained in the OUTPUT DOCUMENTS (see Figure C.2), which will be necessary to carry out other steps.

Each step is detailed for easy comprehension of the information which is there required and generated (see Figure C.2), where the essential documents are shown, some of them appearing in an aggregate mode (e.g. PROCEDURES, FEEDBACK DOCUMENTS).

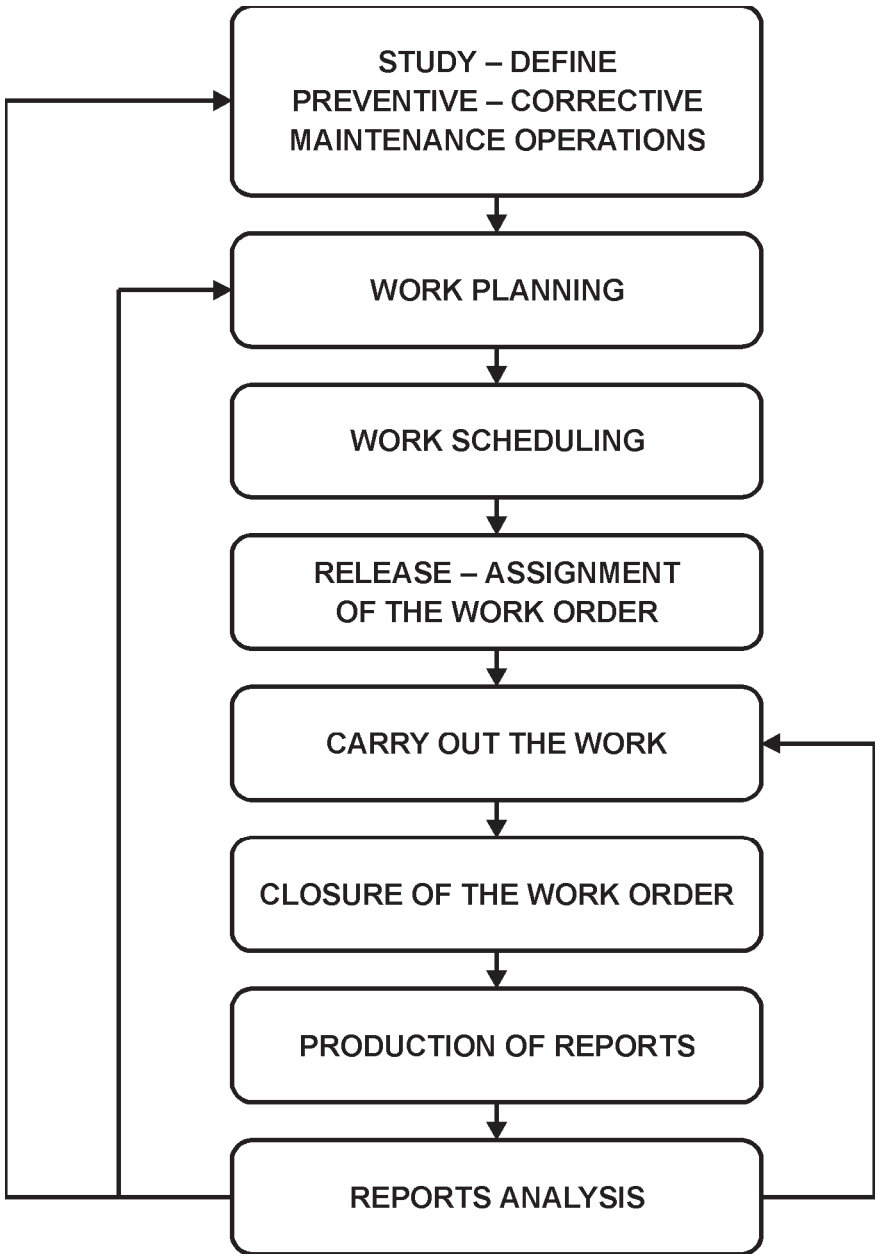
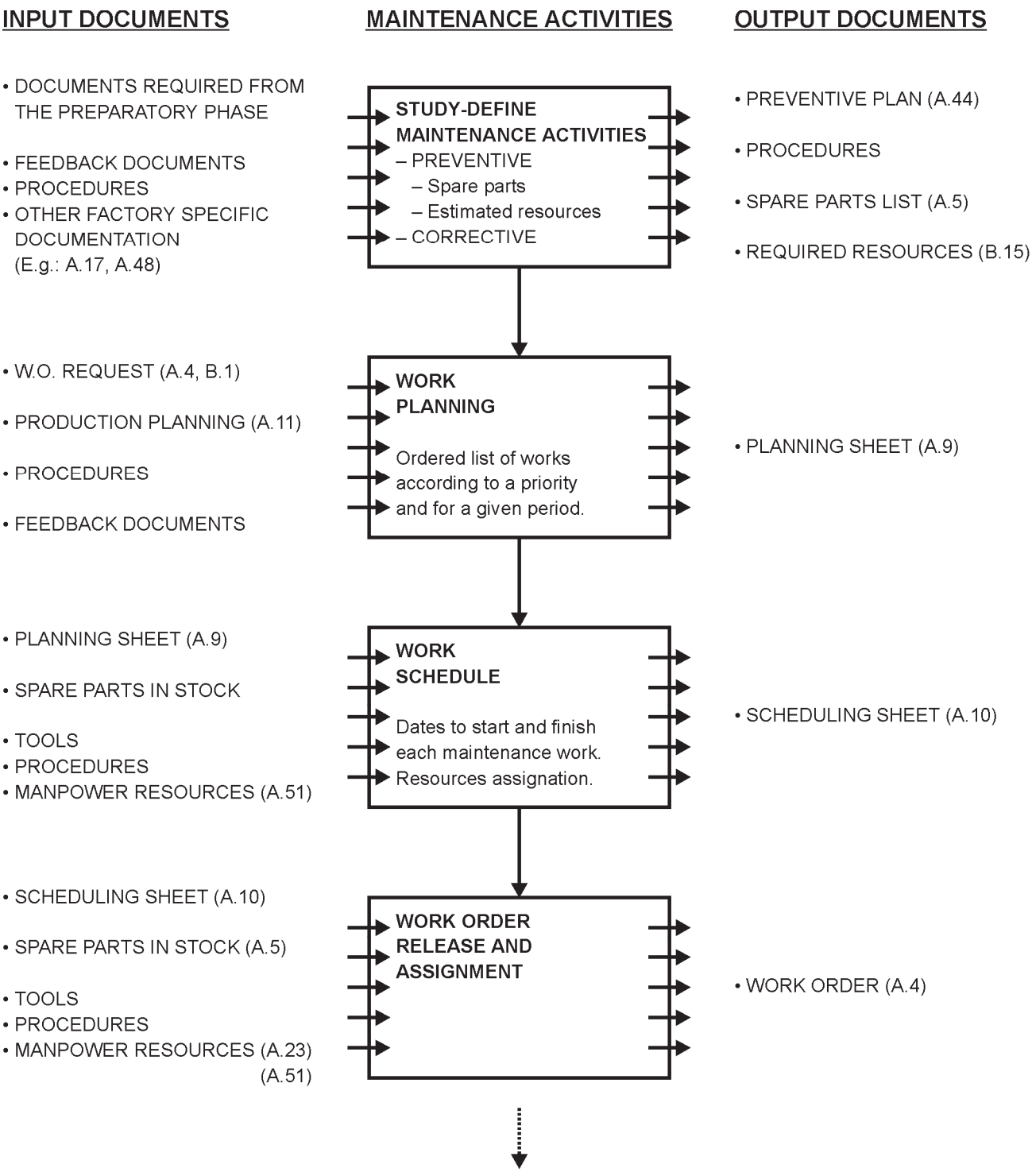


Figure C.1 — Maintenance workflow



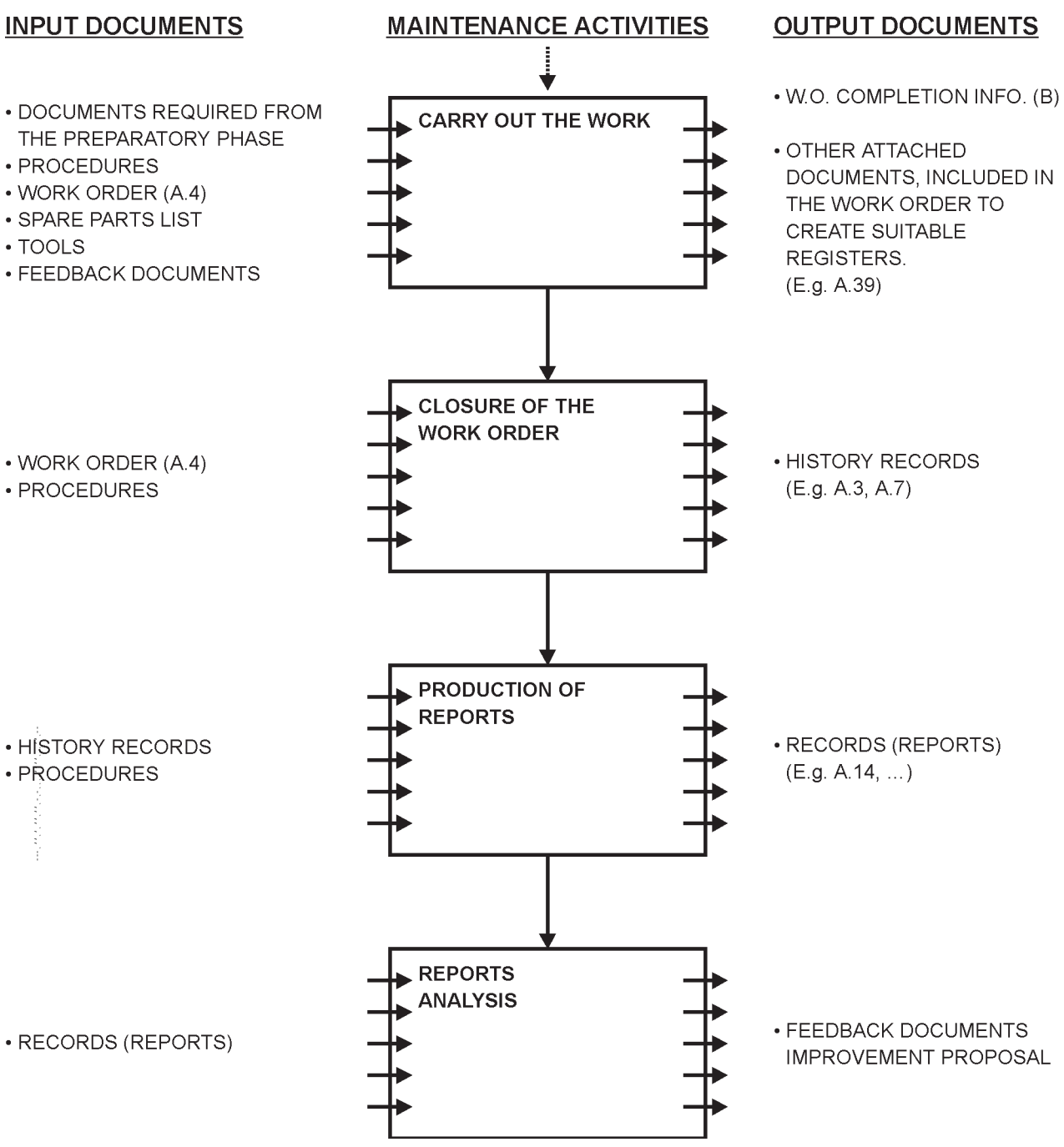


Figure C.2 — Input/Output documents

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