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Vzdrževanje - Terminologija s področja vzdrževanja

Maintenance - Maintenance terminology

Instandhaltung - Begriffe der Instandhaltung

Maintenance - Terminologie de la maintenance

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English Version

Maintenance - Maintenance terminology

Maintenance - Terminologie de la maintenance

Instandhaltung - Begriffe der Instandhaltung

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Foreword

This document (EN 13306:2010) 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of an identical text or by endorsement, at the latest by February 2011, and conflicting national standards shall be withdrawn at the latest by February 2011.

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Introduction

The purpose of this European Standard is to define the generic terms used for all types of maintenance and maintenance management irrespective of the type of item considered. Maintenance of software only is not covered in this standard. However, maintenance of items and systems containing software is considered.

It is the responsibility of any maintenance management to define its maintenance strategy according to the following main objectives:

— to ensure the availability of the item to function as required, at optimum costs;

— to consider the safety and any other mandatory requirements associated with the item;

— to consider any impact on the environment;

— to uphold the durability of the item and/or the quality of the product or service provided considering costs where necessary.

As a part of the requirement of CEN/TC 319 it was necessary to produce a comprehensive structured generic maintenance vocabulary standard containing the main terms and their definitions.

Maintenance provides an essential contribution to the dependability of an item. Correct and formal definitions are required which will give the user of associated maintenance standards a fuller understanding of the maintenance terms used. These terms may be of particular importance in the formulation of maintenance contracts.

The terms contained in this standard indicate that maintenance is not confined to the technical actions alone but includes other activities such as planning, documentation handling, etc.

The standard IEC 60050-191 has been used as a basis for the preparation of this standard but some terms have been modified. Not all terms specified in IEC 60050-191 are included in this European Standard. Readers are referred to this IEC standard for further definitions.

1 Scope

This European Standard specifies generic terms and definitions for the technical, administrative and managerial areas of maintenance. It may not be applicable to terms which are used for the maintenance of software only.

2 Fundamental terms

2.1
maintenance
combination of all technical, administrative and managerial actions during the life cycle of an item intended to retain it in, or restore it to, a state in which it can perform the required function

NOTE See also the definitions of improvement and modification.

2.2
maintenance management
all activities of the management that determine the maintenance objectives, strategies and responsibilities, and implementation of them by such means as maintenance planning, maintenance control, and the improvement of maintenance activities and economics

2.3
maintenance objective
target assigned and accepted for the maintenance activities

NOTE These targets may include for example availability, cost reduction, product quality, environment preservation, safety, asset value preservation.

2.4
maintenance strategy
management method used in order to achieve the maintenance objectives

NOTE Examples could be outsourcing of maintenance, allocation of resources, etc.

2.5
maintenance plan
structured and documented set of tasks that include the activities, procedures, resources and the time scale required to carry out maintenance

2.6
required function
function, combination of functions, or a total combination of functions of an item which are considered necessary to provide a given service

NOTE 1 To provide a given service may also include asset value preservation.

NOTE 2 The given service may be expressed or implied and may in some cases be below the original design specifications.

2.7
dependability
ability to perform as and when required

NOTE 1 Dependability characteristics include availability and its influencing factors (reliability, recoverability, maintainability, maintenance support performance) and, in some cases, durability, economics, integrity, safety, security and conditions of use.

NOTE 2 Dependability is used descriptively as an umbrella term for the time-related quality characteristics of a product or service.

2.8
maintenance supportability
maintenance support performance
ability of a maintenance organization to have the correct maintenance support at the necessary place to perform the required maintenance activity when required

2.9
operation
combination of all technical, administrative and managerial actions, other than maintenance actions, that results in the item being in use

NOTE Maintenance actions carried out by operators are not included in operation.

3 Item related terms

3.1
item
part, component, device, subsystem, functional unit, equipment or system that can be individually described and considered

NOTE 1 A number of items e.g. a population of items, or a sample, may itself be considered as an item.

NOTE 2 An item may consist of hardware, software or both.

NOTE 3 Software consists of programs, procedures, rules, documentation and data of an information processing system.

3.2
asset (physical)
item formally accountable

3.3
repairable item
item which may be restored under given conditions, and after a failure to a state in which it can perform a required function

NOTE The given conditions may be economical, ecological, technical and/or others.

3.4
consumable item
item or material which is expendable, may be regularly replaced and generally is not item specific

NOTE Generally, consumable items are relatively low cost compared to the item itself.

3.5
spare part
item intended to replace a corresponding item in order to retain or maintain the original required function of the item

NOTE 1 The original item may be subsequently repaired.

NOTE 2 In English, any item that is dedicated and/or exchangeable for a specific item is often referred to as replacement item.

3.6
insurance spare part
spare part which is not normally needed during the useful life of the item but whose unavailability would involve an unacceptable downtime due to its provisioning

NOTE If the spare part is expensive then for accountancy purposes such a part may be considered as a capital asset.

3.7
indenture level
level of sub-division within an item hierarchy

NOTE 1 Examples of indenture levels are: system, subsystem and component.

NOTE 2 From the maintenance perspective, the indenture level depends on the complexity of the item's construction, the accessibility to sub-items, skill level of maintenance personnel, test equipment facilities, safety considerations, etc.

4 Properties of items

4.1
availability
ability to be in a state to perform as and when required, under given conditions, assuming that the necessary external resources are provided

NOTE 1 This ability depends on the combined aspects of the reliability, maintainability and recoverability of the item and the maintenance supportability.

NOTE 2 Required external resources, other than maintenance resources, do not affect the availability of the item although the item may not be available from the user's viewpoint.

NOTE 3 Availability may be quantified using appropriate measures or indicators and is then referred to as availability performance.

4.2
reliability
ability of an item to perform a required function under given conditions for a given time interval

NOTE 1 It is assumed that the item is in a state to performed as required at the beginning of the time interval.

NOTE 2 Reliability may be quantified as a probability or performance indicators by using appropriate measures and is then referred to as reliability performance.

NOTE 3 In some cases a given number of unit of use can be considered instead of a given time interval (number of cycles, number of running hours, number of kilometres, etc.).

4.3
intrinsic reliability
inherent reliability
reliability of an item determined by design and manufacture

4.4
maintainability
ability of an item under given conditions of use, to be retained in, or restored to, a state in which it can perform a required function, when maintenance is performed under given conditions and using stated procedures and resources

NOTE Maintainability may be quantified using appropriate measures or indicators and is then referred to as maintainability performance.

4.5
intrinsic maintainability
inherent maintainability
maintainability of an item determined by the original design

4.6
conformity
fulfilment of a requirement

4.7
durability
ability of an item to perform a required function under given conditions of use and maintenance, until a limiting state is reached

NOTE 1 A limiting state of an item may be characterized by the end of the useful life.

NOTE 2 The limiting state may be redefined by changes in conditions of use.

4.8
redundancy
in an item, existence of more than one means for performing a required function when needed

4.9
active redundancy
redundancy wherein more than one means for performing a required function are operating simultaneously

4.10
standby redundancy
redundancy wherein an alternative means for performing the particular function is only activated when the active means is unavailable

NOTE Standby redundancy is often referred to as passive redundancy.

4.11
useful life
time interval from a given instant until the instant when a limiting state is reached

NOTE The limiting state may be a function of failure rate, maintenance support requirement, physical condition, economics, age, obsolescence, changes in the user's requirements or other relevant factors.

4.12
mean failure rate
number of failures of an item in a given time interval divided by the time interval

NOTE In some cases unit of time can be replaced by units of use.

4.13
life cycle
series of stages through which an item goes, from its conception to disposal

4.14
obsolescence (for maintenance purposes)
inability of an item to be maintained due to the unavailability on the market of the necessary resources at acceptable technical and/or economic conditions

NOTE 1 The necessary resources can be:

— one (or more) sub-item needed to restore the item;

— tools or monitoring or testing devices;

— documentary resources;

— skills;

— etc.

NOTE 2 The unavailability of the resources can be due to:

— technological development;

— market situation;

— absence of supplier;

— regulations.

5 Failures and events

5.1
failure
termination of the ability of an item to perform a required function

NOTE 1 After failure the item has a fault, which may be complete or partial.

NOTE 2 "Failure" is an event, as distinguished from "fault", which is a state.

NOTE 3 The concept as defined does not apply to items consisting of software only.

5.2
failure mode
manner in which the inability of an item to perform a required function occurs

NOTE 1 The use of the term "fault mode" is deprecated.

NOTE 2 A failure mode may be defined by the function lost or the state transition that occurred.

5.3
failure cause
circumstances during specification, design, manufacture, installation, use or maintenance that result in failure

5.4
wear-out-failure
failure whose probability of occurrence increases with the operating time or the number of operations of the item and the associated applied stresses

NOTE Wear-out is a physical phenomenon which results in a loss, deformation or change of material.

5.5
ageing failure
failure whose probability of occurrence increases with the passage of calendar time

NOTE 1 This time is independent of the operating time of the item.

NOTE 2 Ageing is a physical phenomenon which involves a modification of the physical and/or chemical characteristics of the material.

5.6
degradation
detrimental change in physical condition, with time, use or external cause

NOTE 1 Degradation may lead to a failure.

NOTE 2 In a system context, degradation may also be caused by failures within the system. (See "degraded state".)

5.7
common cause failures
failures of several items resulting from the same direct cause and where these failures are not consequences of each other

NOTE Common cause failures may reduce the effect of system redundancy.

5.8
primary failure
failure of an item not caused either directly or indirectly by a failure or a fault of another item

5.9
secondary failure
failure of an item caused either directly or indirectly by a failure or a fault of another item

5.10
sudden failure
failure that could not be anticipated by prior examination or monitoring

5.11
hidden failure
failure which is not detected during normal operation

5.12
failure mechanism
physical, chemical or other processes which may lead or have led to failure

5.13
severity (of a failure or a fault)
potential or actual detrimental consequences of a failure or a fault

NOTE The severity of a failure may be related to safety, availability, costs, quality, environment, etc.

5.14
criticality (of a failure or a fault)
numerical index of the severity of a failure or a fault combined with the probability or frequency of its occurrence

NOTE The numerical index in this context may be defined, for example, as an area in the frequency of failure occurrence - severity matrix diagram (see Annex E).

5.15
failure criteria
pre-defined conditions to be accepted as conclusive evidence of failure

EXAMPLE A defined limiting state of wear, crack propagation, performance degradation, leakage, emission, etc. beyond which it is deemed to be unsafe or uneconomic to continue operation.