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**SIST-TS CEN/TS 15331:2006**

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**Merila za naļ rtovanje, upravljanje in kontrolo storitev vzdrģevanja stavb**

Criteria for design, management and control of maintenance services for buildings

Kriterien für Entwicklung, Leitung und Überwachung von Instandhaltungsdienstleistungen von Gebäuden

Criteres pour la conception, le management et le contrôle de la maintenance des bâtiments



**Ta slovenski standard je istoveten z:** **CEN/TS 15331:2005**



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TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

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# CEN/TS 15331

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English Version

# Criteria for design, management and control of maintenance services for buildings

Critères pour la conception, le management et le contrôle de la maintenance des bâtiments

Kriterien für Entwicklung, Leitung und Überwachung von Instandhaltungsdienstleistungen von Gebäuden

This Technical Specification (CEN/TS) was approved by CEN on 10 November 2005 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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## Foreword

This Technical Specification (CEN/TS 15331:2005) has been prepared by Technical Committee CEN/TC 319 “Maintenance”, the secretariat of which is held by UNI.

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

## Introduction

A building differs from other items subject to maintenance essentially by:

— the need to maintain property value over time;

— the possibility that the property may undergo a change in its intended use during its service life;

— the number of persons responsible for maintenance (owner, administrator, tenant, employee);

— its duration over time (decades).

Under these conditions it is difficult to predict with any degree of precision the service life of each component part. Budgeting for maintenance, and specifically the scheduling of maintenance interventions, requires the availability and the analysis of feedback data obtained from maintenance activities.

The purpose of building maintenance is to ensure utilisation of the asset by maintaining its property value and initial performances within acceptable limits for its whole service life, as well as promoting technical and regulatory modifications to initial or new technical performances as selected by the operator or required by law.

To obtain this goal, the definition of general criteria to collect data that is essential for maintenance activities and the use of suitable information systems may be used to develop database and management tools to improve the profitability of buildings.

## 1 Scope

This Technical Specification specifies the criteria and the general methods in the planning, management and control of maintenance in buildings and their surrounding area according to the objectives of the owners and users and the required quality of maintenance.

This Technical Specification should apply to the maintenance management of buildings.

For informative purposes a possible classification of buildings is given in Annex A.

## 2 Normative references

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

EN 13306:2001, *Maintenance terminology*

EN 13460:2002*, Maintenance - Documents for maintenance*

ISO 6707-1:2004, *Building and civil engineering – Vocabulary – Part 1: General terms*



## 3 Terms and definitions



For the purposes of this Technical Specification, the terms and definitions given in EN 13306:2001, EN 13460:2002, ISO 6707-1:2004 and the following apply.



**3.1**
**building**
construction works that has the provision of shelter for its occupants or contents as one of its main purposes; usually partially or totally enclosed and designed to stand permanently in one place

[definition of ISO 6707-1:2004]

NOTE Including envelope, structural and non structural elements, finishing, fitments, equipment and installations and external works.

**3.1.1**
**maintenance of buildings**
combination of all technical, administrative and managerial actions during the lifecycle of a building (or a part of it), intended to retain it, or restore it to, a state in which it can perform the required function

**3.2**
**component**
construction element or functional grouping of several elements considered as part of a single system

**3.3**
**property value**
minimum production cost for a building, inclusive of business profit, in respect of predetermined performances

**3.4**
**analysis**
activities aimed at acquiring knowledge of the status and operating conditions of the building and its component parts

**3.5**
**mid and long term budgeting**
determination of the general extent of expenses in respect of pre-established objectives; also intended to schedule interventions, and therefore costs and resources, evenly over time if possible

**3.6**
**short term cost budgeting**
more specific quantification of expenses compared to the mid and long term budgeting of interventions for a given year, for the purpose of optimising the workload

**3.7**
**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

[definition of EN 13306:2001, see 7.6]

**3.8**
**preventive maintenance**
maintenance carried out at predetermined intervals or according to prescribed criteria and intended to reduce the probability of failure or the degradation of the functioning of an item

[definition of EN 13306:2001, see 7.1]

**3.9**
**condition based maintenance**
preventive maintenance based on performance and/or parameter monitoring and the subsequent actions



NOTE Performance and parameter monitoring may be scheduled, on request or continuous.

[definition of EN 13306:2001, see 7.4]



**3.10**
**opportunity maintenance**
maintenance work performed in a sequential or parallel manner on several components, in connection with another ongoing activity (for example an emergency maintenance activity), achieving synergy and synchronicity in the use of financial, technical and organisational resources

**3.11**
**obsolescence factors**
all the external conditions that lead to a modification over time of the required performances

**3.12**
**inspection manual**
systematic collection with managerial approach of all documents pertaining to inspection and monitoring activities

**3.13**
**operation manual (instruction manual)**
technical instructions to reach a proper item function performance according to its technical specifications and safety conditions (definition of EN 13460:2002, see 5.2)

**3.14**
**maintenance manual**
technical instructions intended to preserve an item in, or restore it to, a state in which it can perform a required function (definition of EN 13460:2002, see 5.3)

**3.15**
**maintenance plan**
structured set of tasks that include the activities, procedures, resources and the time scale required to carry out maintenance (definition of EN 13306:2001, see 2.5)

**3.16**
**assets register**
item basic information, related to technical, contractual, administrative, locational and operational aspects, in order to define it within the company

# 4 Basic data and requirements

## 4.1 General

The information required to carry out a maintenance operation shall be available either for new constructions and restoration of buildings (maintenance plans developed inside the construction projects); for existing and operating buildings this information is to be progressively acquired in a systematic manner and controlled and filed appropriately, to be used for subsequent controls.

Since the complete collection of information requires times and costs that cannot be considered negligible, the procedure shall be planned in advance and the extent of the collection evaluated on a case-by-case basis.

NOTE The information required should describe the assets as a whole and its adequacy with respect to usability and value. The Assets Register (see 3.16) could also be used to collect the required information.



### 4.1.1 Preliminary data collection

During this initial phase the property to be maintained is to be identified and quantified; the data shall include all documents available and the following information, as a minimum:



— location;

— gross volume and surface area, divided according to intended use (refer to standards if applicable);

— general characteristics of component parts;

— level of compliance with legal and regulatory requirements (objectives to be attained);

— status of maintenance upgrading in accordance with pre-determined operational specifications;

— external constraints (monumental and environmental, active and passive servitudes, agreements with public bodies and bordering landowners etc.);

— legal documents relating to the installation, operation and maintenance of equipment and other parts;

— status of distribution systems and data about consumption (energy, water, etc.);

— type and characteristics of services required to ensure operation of the building (premises for doorkeeper and cleaners, heating, etc.).

### 4.1.2 Specific collection of information

All other information shall then be collected, using any existing synergies with other activities, such as the operation of collecting information required for building management.

The data collected shall be accurately identified and its presentation format codified (see Clause 7).

The information categories required are the following:

— inventory of buildings and equipments: identification, location and description supported by an appropriate coding system for the building complex, individual buildings, technological system for each building subdivided into technological units, technical elements, component parts and the material of which they are made;

— drawings: sizes, position and layout of the various components;

NOTE For example, these may consist of plans and cross-sections, structural drawings and systems layouts. This process is facilitated if the drawings are computerised.

— to be reliable, the above information shall refer to the ‘as built’ status of the building and shall be kept updated during the maintenance;

— verification of status of efficiency, functionality and compliance with applicable rules and standards (see 4.2);

— residual service life, for each component, predicted in accordance with age, quality and conditions of use, and in relation with the service life initially foreseen;

— technical specifications: especially concerning equipment and building services in order to identify characteristics and ‘established operating conditions’;

— repair cost: to restore the functionality of a component;



— replacement costs: for each component, as a basis for a financial assessment of the maintenance plan;

— cost for non-availability and/or down-state: estimate, at least for critical components, of costs arising from the down-state of the components or from their inability to provide the services for which they are intended;



— information about critical construction solutions (for example arch vaulting);

— instruction manuals and maintenance manuals: experience and recommendations of the builder/manufacturer to be used to develop an appropriate maintenance plan.

## 4.2 Diagnostic methods and instruments for maintenance

Whenever is possible, maintenance operators should make extensive use of diagnostics in managing the buildings subject to the maintenance.

The decisions concerning any maintenance intervention should be based on the results and the information coming from the diagnosis activities.

The effectiveness of these tests and the interpretation of the diagnostic results should be associated with the use of standard methods and instruments to obtain reliable, comparable and traceable results (see Table 1).

**Table 1 — Types, objectives and methods of diagnostic**

| Type of diagnostic | Objectives | Methods and procedures for examination | Types of evaluation |
|---|---|---|---|
| General diagnostic or pre-diagnostic | Objective description of any anomalies, malfunctions or degradation<br>General information on condition of building | Visual inspection<br>Check lists<br>Information from previous inspections<br>Simple portable instruments | Qualitative |
| In-depth diagnostic | Thorough examination of the actual status and its interpretation<br>Collection of sufficient information for detailed design of work to be undertaken | Non destructive tests<br>Destructive instrumental tests (sampling from building and laboratory tests)<br>Analytical methods (diagnostic documents, malfunction chart, fault trees, etc)<br>Expert systems | Qualitative and Quantitative |



The data collected and analysed shall be included in the documents accompanying the inspection manual; these are to consist of data sheets such as the following:



a) technical or identification sheet. It contains information on: the position within the building, the functions required, the types of service provided, the performance specifications, the physical and functional relationship with other components, the installation and operation characteristics;

b) diagnostic sheet. It contains information on the methods and instruments to be used to analyse the malfunctioning or pathological deterioration as well as their evaluation criteria;

c) clinical sheet. It contains the interpretation of the actual status, all technical and financial information on the interventions carried out and indications of remedies or corrective action to be adopted.

There shall be one of these data sheet for each technical element or component, in accordance with the more appropriate breakdown structure, accompanied by drawings and information to ensure prompt identification.

NOTE The information contained in the diagnostic and clinical data sheet are an integral part of the feedback (see Clause 10).

A specific plan for the diagnostic is to be prepared. This plan shall consider the objectives to be attained, operating conditions, times for implementation and cost of the intervention.

For large real estate, sampling techniques shall be used for the general diagnosis. Buildings are then to be grouped by homogeneous classes, according to age, intended use, location, main characteristics and type of construction.

With respect to the results of the general diagnostic and the effects of possible hazardous situations or down states, the critical components shall be identified and submitted to an in-depth analysis.

Diagnostic planning shall be periodically reviewed according to needs.