INTERNATIONAL STANDARD

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Buildings and constructed assets — Service-life planning —

Part 5: Life-cycle costing

Bâtiments et biens immobiliers construits — Prévision de la durée de vie —

Partie 5: Approche en coût global

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 15686-5 was prepared by Technical Committee ISO/TC 59, *Building construction*, Subcommittee SC 14, *Design life*.

ISO 15686 consists of the following parts, under the general title *Buildings and constructed assets — Service-life planning*:

— *Part 1: General principles*

— *Part 2: Service life prediction procedures*

— *Part 3: Performance audits and reviews*

— *Part 5: Life-cycle costing*

— *Part 6: Procedures for considering environmental impacts*

— *Part 7: Performance evaluation for feedback of service life data from practice*

— *Part 8: Reference service life and service-life estimation*

The following parts are in preparation:

— *Part 9: Guidance on assessment of service-life data*

— *Part 10: Levels of functional requirements and levels of serviceability — Principles, measurement and use*

Introduction

0.1 Objectives

The key objectives of this part of ISO 15686 are to

— establish clear terminology and a common methodology for life-cycle costing (LCC),

— enable the practical use of LCC so that it becomes widely used in the construction industry,

— enable the application of LCC techniques and methodology for a wide range of procurement methods,

— help to improve decision making and evaluation processes at relevant stages of any project,

— address concerns over uncertainties and risks and improve the confidence in LCC forecasting,

— make the LCC and the underlying assumptions more transparent and robust,

— set out the guiding principles, instructions, definitions for different forms of LCC and reporting,

— provide the framework for consistent LCC predictions and performance assessment, which facilitates more robust levels of comparative analysis and cost benchmarking,

— provide a common basis for setting LCC targets during design and construction, against which actual cost performance can be tracked and assessed over the asset life span,

— provide guidance on when to undertake LCC, to what level and what cost headings are appropriate for consideration,

— help unlock the real value of effectively doing LCC in construction by using service-life planning,

— clarify the differences between life-cycle costing and whole-life costing (WLC),

— provide a generic menu of costs for LCC/WLC compatible with and customizable for specific national or international cost codes and data-structure conventions,

— provide cross-references to guidance on associated activities within the other parts of ISO 15686.

0.2 Life-cycle costing, service-life planning and other performance requirements

Life-cycle costing is a valuable technique that is used for predicting and assessing the cost performance of constructed assets. Life-cycle costing is one form of analysis for determining whether a project meets the client's performance requirements. Analyses can necessitate the use of other parts of ISO 15686 and current economic data from clients and the construction industry (see Figure 1). It should be possible to use this part of ISO 15686 without extensive reference to other parts, although a number of the terms and techniques described are covered in more detail in the other parts. Where applicable, this is referenced in the text. The other parts of ISO 15686 that are most relevant for life-cycle costing are ISO 15686-1, ISO 15686-3 and ISO 15686-6.

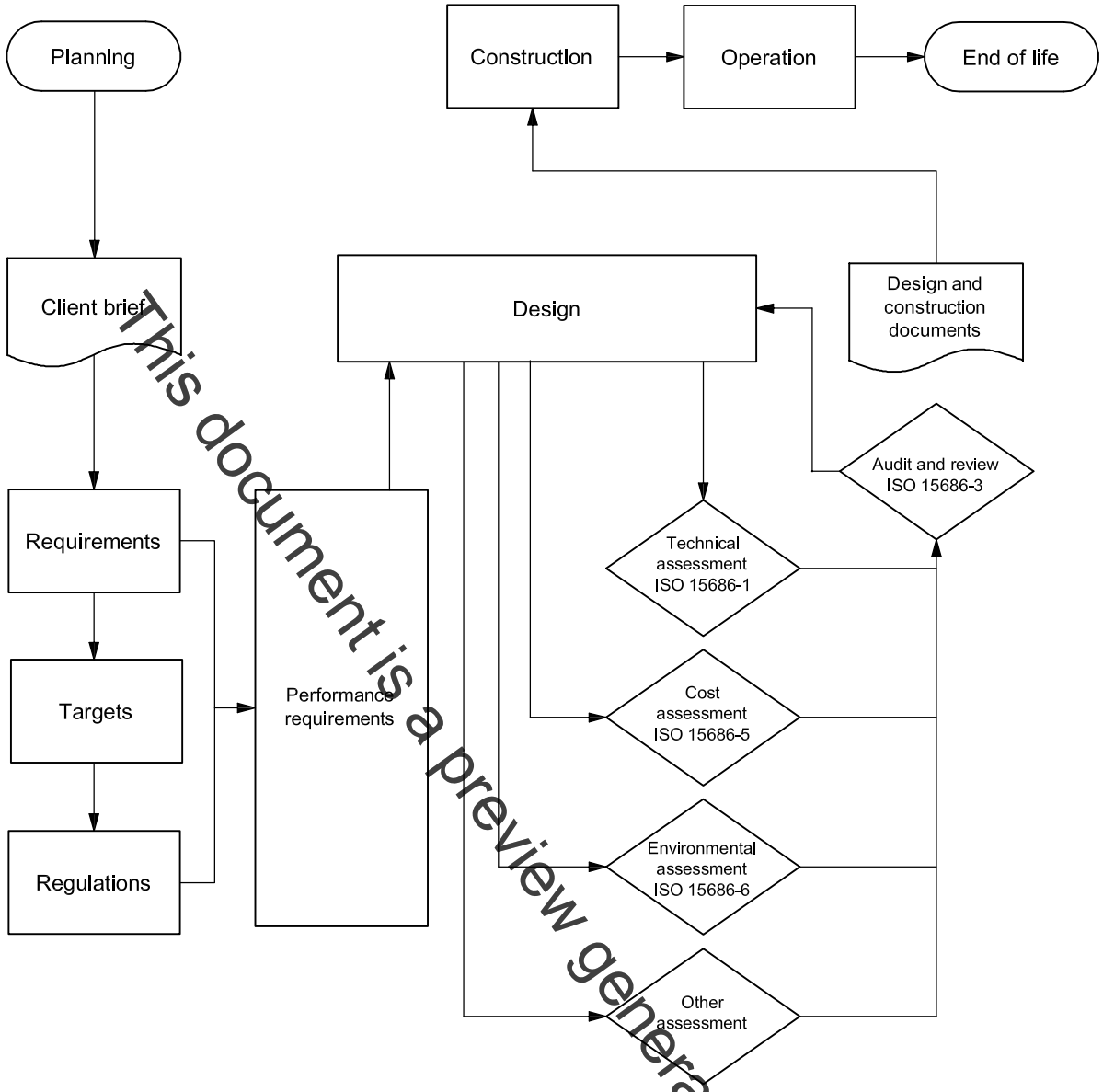

Figure 1 — Performance requirements in the context of the project life cycle

The Bibliography includes some informative national standards and guidance that provide more detail on aspects such as levels of cost analysis, examples of analysis and application of the principles for practical projects.

0.3 Who can use this part of ISO 15686?

The provisions of this part of ISO 15686 are intended primarily for

— procurers of constructed assets, with an interest in long-term ownership; these may be public or private, or lessees with a reasonably long period of interest in the property and/or responsibility for maintenance and/or operational costs,

— designers,

— constructors and their specialist suppliers of materials and components,

— facility operators (to help them input more effectively into the design process),

— cost consultants and other specialists.

The provisions in this part of ISO 15686 are particularly relevant to public clients, where the lack of any projected income from some constructed assets can make traditional investment appraisals more challenging. They are also relevant to the work of specialists providing information on service life and on environmental performance.

The period of interest of the client and the contractual responsibilities/liabilities for meeting costs tend to determine the requirements for life-cycle costing.

Life-cycle costing is relevant at portfolio/estate management, constructed asset and facility management levels, primarily to inform decision making and for comparing alternatives. Life-cycle costing allows consistent comparisons to be performed between alternatives with different cash flows and different time frames. The analysis takes into account relevant factors from throughout the service life, with regard to the client's specified brief and the project-specific service-life performance requirements.

Buildings and constructed assets — Service-life planning —

Part 5:
Life-cycle costing

1 Scope

This part of ISO 15686 gives guidelines for performing life-cycle cost (LCC) analyses of buildings and constructed assets and their parts.

NOTE 1 Life-cycle costing takes into account cost or cash flows, i.e. relevant costs (and income and externalities if included in the agreed scope) arising from acquisition through operation to disposal.

NOTE 2 Life-cycle costing typically includes a comparison between options or an estimate of future costs at portfolio, project or component level. Life-cycle costing is performed over an agreed period of analysis. It is advisable to make clear whether the analysis is for only part or for the entire life cycle of the constructed asset.

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.

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

3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions given in ISO 6707-1 and the following apply.

3.1 Costs

3.1.1
acquisition cost
all costs included in acquiring an asset by purchase/lease or construction procurement route, excluding costs during the occupation and use or end-of-life phases of the life cycle of the constructed asset

3.1.2
capital cost
initial construction costs and costs of initial adaptation where these are treated as capital expenditure

NOTE The capital cost may be identical to the acquisition cost if initial adaptation costs are not included.

3.1.3
discounted cost
resulting cost when the real cost is discounted by the real discount rate or when the nominal cost is discounted by the nominal discount rate