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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 24359-1

Building commissioning process planning —

Part 1: New buildings

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ISO/TC 205

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 205, *Building Environment Design*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This standard applies to the development of the building commissioning plan, which documents the building commissioning process for selected systems or assemblies at each phase of the project, from pre-design through occupancy and operation. The standard establishes normative requirements for Commissioning Planning during indoor environment design process in a framework consistent with ISO 16813 General Principles and the other commissioning standards under development for functional performance testing of specific components relating to the indoor environment and the energy use such as the ISO 19455 series and ISO 21105 series. While “commissioning” is used in a range of industries and contexts with different meanings, such as a singular event at the end of an industrial construction project, this standard addresses the commissioning process that occurs throughout the design, construction, and first year of new building or major renovation projects.

Building commissioning experience shows that early initiation of commissioning and clear communication of the commissioning process to project team members from the beginning of design are common characteristics of higher value commissioning processes and approaches. Therefore, this standard, while intended for use at the design stage of the project, describes requirements for the commissioning process beyond the design stage. This allows the commissioning requirements to be appropriately embedded in the project documents so that, as procurement proceeds, commissioning requirements are clearly conveyed to affected members of the project team, whether owners, designers, contractors, operators, or occupants.

This standard can be applied to any type of system or assembly being commissioned in new building and major renovation or system replacement construction projects. The commissioning plan is developed by the commissioning provider for use by project team members and other stakeholders to determine the tasks and activities required to commission the project, including post-occupancy commissioning tasks associated with the project, in accordance with the owner’s project requirements.

Commissioning providers use this standard to develop a project-specific commissioning plan, which documents the systems or assemblies to be commissioned, the scope of tasks associated with the process to achieve the owner’s project requirements (OPR), and the work plan to accomplish those tasks. The systems or assemblies to be commissioned and the commissioning requirements for the project are established by the owner with the support of the commissioning provider. This standard prescribes the minimum set elements to be in the commissioning plan that can be commonly applied, regardless of which systems or assemblies are being commissioned on a project.

The standard establishes the requirements for the rigor and duration of the commissioning process. These requirements range from basic commissioning with an emphasis on construction and turnover, to enhanced commissioning with more substantial activities during design and in the first year of the building’s working life. The framework addresses the full range of commissioned systems and building elements which impact indoor environment. These systems and elements to be commissioned vary widely by project. This international commissioning standard addresses planning activities for a wide range of project types and a variety of systems or assemblies to be commissioned.

This framework considers different project delivery methods including those not addressed by existing national standards. These previous standards were typically developed for older project delivery methods where design was completed prior to the start of construction, and design was performed by a different entity than construction. The same is true of the commissioning processes required by various green building certification schemes in various regions around the world. The global marketplace now utilizes a range of highly variable delivery methods such as Tender Offer, Design-Build, and Integrated Project Delivery, to which the building commissioning processes prescribed in this standard readily apply.

A project may have certain systems or assemblies that are required to receive a certain amount of commissioning scope and rigor by law or regulation. This standard does not alter such legal requirements. The owner may select a green building certification scheme or other optional project element which imposes or implies commissioning requirements. Such requirements do not alter the requirements of this standard. Due to differing complexity, criticality, or other factors, this standard may require different levels of rigor to be applied to different systems or assemblies, or in different project areas.

This standard applies to commissioning planning during design for commissioning activities through the first year of occupancy. This planning may be impacted by the Owner’s intentions for further subsequent

commissioning activities in existing buildings such as on-going commissioning, recommissioning and retro-commissioning, but such lifecycle commissioning activities are not addressed in this standard.

Building commissioning process planning —

Part 1: New buildings

1 Scope

This document addresses the development of a building commissioning plan for new construction, major renovations, or system and assembly replacement projects. The commissioning plan incorporates commissioning activities which begin during early project stages, and continue through pre-design, design, construction, turnover and the first year of operation. The commissioning plan shall cover these later stages, although it is first developed during the design stage.

The commissioning plan presents the intended process to verify and document that the quality of the built project in operation meets the requirements of the owner. This document provides an overarching process for planning of commissioning any aspect of a building project and is intended for use with system or discipline specific standards. This standard does not include retro-commissioning or recommissioning in existing buildings.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 16813:2006, *Building environment design — Indoor environment — General principles*

ISO 19455-1:2019, *Planning for functional performance testing for building commissioning — Part 1: Secondary hydronic pump, system and associated controls*

ISO 21105-1:2019, *Performance of buildings — Building enclosure thermal performance verification and commissioning — Part 1: General requirements*

ISO/TS 21274:2020, *Light and lighting — Commissioning of lighting systems in buildings*

ASHRAE Guideline 0-2019, *The Commissioning Process*

ASHRAE Guideline 1.4-2019, *Preparing Systems Manuals for Facilities*

ASHRAE Standard 202:2024, *Commissioning Process for Buildings and Systems*

3 Terms and definitions

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

3.1

Basis of design (BoD)

A document that records the concepts, calculations, decisions, and product selections used to meet the owner's project requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

3.2

Checklists

Project and element-specific checklists that are developed (or in some cases reviewed for suitability for use in commissioning if developed by others) by the commissioning provider, used during all phases of commissioning, and reviewed by the commissioning provider to identify any issues (see issues log) and to verify that the owner's project requirements are being achieved. Checklists are used for evaluation, testing, training, and other design and construction requirements.

3.2.1

Design checklists

Checklists developed by the commissioning provider to verify that elements of the design are in compliance with the owner's project requirements.

3.2.2

Construction checklists

Checklists used to verify that appropriate materials and components are on-site, ready for installation, correctly installed, functional, and in compliance with the owner's project requirements.

3.3

Commissioning (Cx), Commissioning process

A quality-focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that all of the relevant systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the owner's project requirements.

Note 1 to entry: *see ISO/TS 21274 for information on commissioning of lighting systems in buildings.*

3.4

Commissioning design review

A review of the design documents to determine compliance with the owner's project requirements, including coordination between systems and assemblies being commissioned, features and access for testing, maintenance, and other reviews required by the owner's project requirements and commissioning plan.

Note 1 to entry: *the following types of design review differ from commissioning design review and are not performed as part of commissioning unless by special contractual arrangement:*

- *Code or regulatory design review: a review of a document typically conducted by staff or designated entity of an authority having jurisdiction; intended to determine whether the content of the document complies with regulations, codes, or other standards administered by the jurisdiction.*
- *Constructability design review: the review of effective integration of construction knowledge into the conceptual planning, design, construction, and field operation of a project to achieve project objectives efficiently, accurately, and cost-effectively; intended to reduce or prevent errors, delays, and cost overruns.*
- *Peer review: an independent and objective comprehensive technical review of the design of the project, or a part thereof, conducted at specified stages of design completion typically conducted by professionals with the same qualifications as the original designers; intended to enhance the quality of the design.*

3.5

Commissioning plan

A plan for implementing the commissioning process which documents the building elements and systems of the project to be commissioned, organization, schedule, allocation of resources, verification methods, and documentation requirements of the commissioning process for a specific project and the specific systems being commissioned.

3.6

Commissioning provider (CxP)

The entity identified by the owner who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning plan, required by this standard to be a third party independent of the owner, designers, and construction team.

3.7

Commissioned systems manual

A composite document focused on the commissioned systems or assemblies that includes the design and construction documentation, facility guide and operation manual, maintenance information, training information, commissioning records, and additional information of use to the owner during occupancy and operations. The progress and final commissioning reports shall be included in the executive summary section of the commissioned systems manual. The included documentation shall provide a complete record of name, scope and where to find all commissioning and related project documentation and findings.

3.8

Commissioning team

Includes members selected from the Owner, Operations, Occupants, Design, and Construction teams, and any special project-specific stakeholders. The commissioning team coordinates actions and information flows between all staff who are involved in the project and commissioning activities.

3.9

Commissioning report

Documentation which records all the planned commissioning activities and results, developed from the final commissioning plan with completed commissioning documentation as attached appendices.

3.9.1

Commissioning progress report

Preliminary documentation which details completed and ongoing commissioning activities, significant findings, and the work plan to complete commissioning activities, issued while the project is ongoing.

3.9.2

Final commissioning report

Documentation which, together with the commissioned systems manual, comprise a comprehensive and complete record of all commissioning activities, results, findings, and related documentation, issued at the end of the contractual commissioning period.

3.10

Construction team

The entities and professionals responsible for constructing the systems and assemblies in the project including contractors, suppliers, and manufacturers. Where a construction project follows a design/build approach, the construction team includes licensed design professionals who may also be part of the design team.

3.11

Contract documents

A wide range of documents that vary from project to project and with the owner's needs, regulations, laws, jurisdictional requirements, and project delivery method, which may include price agreements; the construction management process; subcontractor agreements or requirements; requirements and procedures for submittals, changes, and other construction requirements; a timeline for completion; and the construction documents.

3.12

Design team

The entities contractually responsible for developing some or all of the design documents.

3.13

Functional performance test (FPT)

The testing to verify the functional performance of each of the commissioned systems according to the owner's project requirements. The functional performance testing collectively documents the verification of the ability of the commissioned systems to meet the owner's project requirements criteria. Each functional performance test is variously led or witnessed by the commissioning provider, whether following procedures authored by the commissioning provider or procedures formulated by others.

Note 1 to entry: *see iso 19455-1 for information on how to plan functional performance tests for specific systems.*