TECHNICAL SPECIFICATION

ISO/IEC TS 22237-7

First edition
2018-05

Information technology — Data centre facilities and infrastructures —

Part 7: Management and operational information

Technologie de l'information — Installation et infrastructures de centres de traitement de données —

Partie 7: Informations de gestion et de fonctionnement



Reference number
ISO/IEC TS 22237-7:2018(E)

© ISO/IEC 2018



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **2**

3 Terms, definitions and abbreviated terms **2**
3.1 Terms and definitions 2
3.2 Abbreviated terms 4

4 Conformance **4**

5 Operational information and parameters **5**
5.1 General 5
5.2 Building construction as per ISO/IEC TS 22237-2 5
5.3 Power distribution as per ISO/IEC TS 22237-3 5
5.3.1 General 5
5.3.2 Generator parameters 6
5.4 Environmental control as per ISO/IEC TS 22237-4 7
5.4.1 General 7
5.4.2 Air handling parameters 7
5.4.3 Cooling parameters 7
5.4.4 Humidity parameters 8
5.5 Telecommunications cabling infrastructure as per ISO/IEC TS 22237-5 8
5.6 Security systems as per ISO/IEC TS 22237-6 8

6 Acceptance test **8**
6.1 General 8
6.2 Building construction (ISO/IEC TS 22237-2) tests 9
6.3 Power distribution (ISO/IEC TS 22237-3) tests 9
6.4 Environmental control (ISO/IEC TS 22237-4) tests 10
6.5 Telecommunications cabling infrastructure (ISO/IEC TS 22237-5) tests 10
6.6 Security systems (ISO/IEC TS 22237-6) tests 10
6.7 Energy efficiency enablement tests 10
6.8 Energy efficiency strategy tests 10
6.9 Monitoring tests 10

7 Operational processes **11**
7.1 General 11
7.2 Operations management 11
7.2.1 Purpose 11
7.2.2 Activities 11
7.2.3 Base KPI 12
7.2.4 Advanced KPI 12
7.3 Incident management 12
7.3.1 Purpose 12
7.3.2 Activities 12
7.3.3 Base KPI: Mean time to repair (MTTR) 13
7.3.4 Advanced KPI: SLA compliance 13
7.4 Change management 13
7.4.1 Purpose 13
7.4.2 Activities 13
7.4.3 Base KPI: Complete change logging 14
7.4.4 Advanced KPI 14
7.5 Asset and configuration management 14
7.5.1 Purpose 14
7.5.2 Activities 15
7.5.3 Base KPI 15

© ISO/IEC 2018 – All rights reserved

7.6 Capacity management ... 15
7.6.1 Purpose ... 15
7.6.2 Activities ... 16
7.6.3 Base KPI: Balance of actual usage and capacity reserve ... 17

8 Management processes ... 17
8.1 General ... 17
8.2 Availability management ... 18
8.2.1 Purpose ... 18
8.2.2 Activities ... 18
8.2.3 Base KPI: Availability accounted to data centre's responsibility ... 19
8.2.4 Advanced KPI: Periods of reduced resilience ... 19
8.3 Security management ... 19
8.3.1 Purpose ... 19
8.3.2 Activities ... 19
8.3.3 Base KPI: number of security incidents ... 20
8.4 Resource management ... 20
8.4.1 Purpose ... 20
8.4.2 Activities ... 20
8.4.3 Base KPIs ... 21
8.5 Energy management ... 23
8.5.1 Purpose ... 23
8.5.2 Activities ... 23
8.5.3 Base KPI ... 23
8.5.4 Advanced KPI ... 24
8.6 Product lifecycle management ... 26
8.6.1 Purpose ... 26
8.6.2 Activities ... 27
8.6.3 Base KPI: Deviation from expected product properties ... 27
8.7 Cost management ... 27
8.7.1 Purpose ... 27
8.7.2 Activities ... 28
8.7.3 Base KPI ... 28
8.8 Data centre strategy ... 29
8.8.1 Purpose ... 29
8.8.2 Activities ... 29
8.8.3 Base KPI: Actuality of agreed strategy ... 30
8.9 Service level management ... 30
8.9.1 Purpose ... 30
8.9.2 Activities ... 30
8.9.3 Base KPI: Discrepancy between service quality and SLA ... 31
8.10 Customer management ... 31
8.10.1 General ... 31
8.10.2 Purpose ... 31
8.10.3 Activities ... 31
8.10.4 Base KPI: Policy compliance ... 32
8.10.5 Advanced KPI: Complaints about communication ... 32

Annex A (informative) **Example for process implementation ... 33**

Annex B (normative) **Security systems ... 35**

Bibliography ... 39

 © ISO/IEC 2018 – All rights reserved

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 document 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 and IEC 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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability for and by Information Technology.*

A list of all parts in the ISO/IEC TS 22237 series can be found on the ISO website.

© ISO/IEC 2018 – All rights reserved

Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres are housing and supporting the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres need to provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, energy consumption of data centres has become critical both from an environmental point of view (reduction of carbon footprint) and with respect to economical considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting, or network operator facilities);

b) security level;

c) physical size;

d) accommodation (mobile, temporary and permanent constructions).

The needs of data centres also vary in terms of availability of service, the provision of security and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control and physical security. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

The ISO/IEC TS 22237 series specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

1) owners, facility managers, ICT managers, project managers, main contractors;

2) architects, consultants, building designers and builders, system and installation designers;

3) facility and infrastructure integrators, suppliers of equipment;

4) installers, maintainers.

At the time of publication of this document, the ISO/IEC TS 22237 series will comprise the following documents:

ISO/IEC TS 22237-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*;

ISO/IEC TS 22237-2, *Information technology — Data centre facilities and infrastructures — Part 2: Building construction*;

ISO/IEC TS 22237-3, *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*;

ISO/IEC TS 22237-4, *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control*;

ISO/IEC TS 22237-5, *Information technology — Data centre facilities and infrastructures — Part 5: Telecommunications cabling infrastructure*;

ISO/IEC TS 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*;

 © ISO/IEC 2018 – All rights reserved

ISO/IEC TS 22237-7, *Information technology — Data centre facilities and infrastructures — Part 7: Management and operational information*;

The inter-relationship of the specifications within the ISO/IEC TS 22237 series is shown in Figure 1.

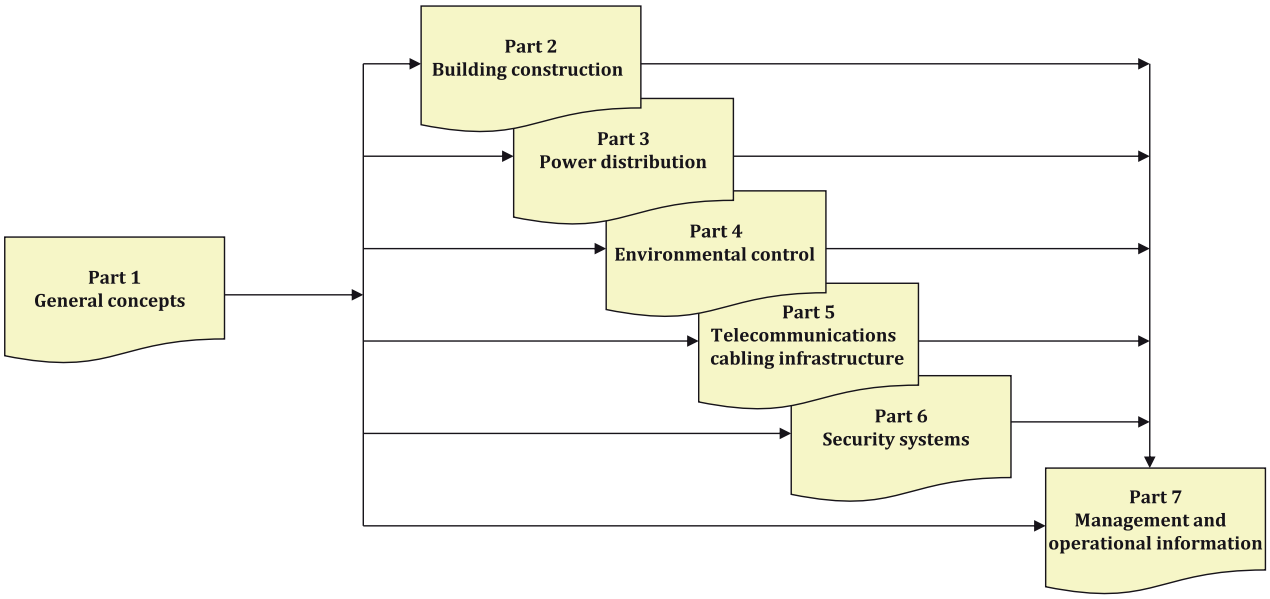


Figure 1 — Schematic relationship between the ISO/IEC TS 22237 series of documents

ISO/IEC TS 22237-2 to ISO/IEC TS 22237-6 specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for "availability", "physical security" and "energy efficiency enablement" selected from ISO/IEC TS 22237-1.

This document addresses the operational and management information (in accordance with the requirements of ISO/IEC TS 22237-1). A data centre's primary function typically is to house large quantities of computer and telecommunications hardware which affects the construction, operation, and physical security. Most of the data centres may impose special security requirements. Therefore, the planning of a data centre by the designer and the various engineering disciplines that will assist in the planning and implementation of the design of the data centre, i.e. electrical, mechanical, security, etc. shall be carried out in cooperation with the IT and telecommunications personnel, network professionals, the facilities manager, the IT end users, and any other personnel involved.

This document is intended for use by and collaboration between facility managers, ICT managers, and main contractors.

The ISO/IEC TS 22237 series does not address the selection of information technology and network telecommunications equipment, software and associated configuration issues.

© ISO/IEC 2018 – All rights reserved

Information technology — Data centre facilities and infrastructures —

Part 7: Management and operational information

1 Scope

This document specifies processes for the management and operation of data centres. The primary focus of this document is the operational processes necessary to deliver the expected level of resilience, availability, risk management, risk mitigation, capacity planning, security and energy efficiency.

The secondary focus is on management processes to align the actual and future demands of users. Figure 2 shows an overview of related processes.

The transition from planning and building to operation of a data centre is considered as part of the acceptance test process in Clause 6.

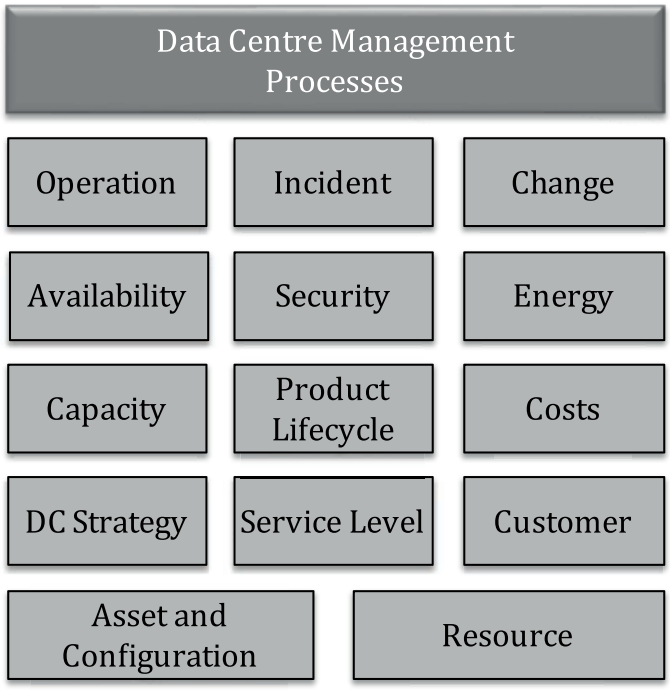


Figure 2 — Data centre management processes overview

NOTE 1 Only processes specific for data centres are in the scope of this document. Business processes like people management, financial management, etc. are out of scope.

NOTE 2 Specific skill sets are required of those working in and operating a data centre.

© ISO/IEC 2018 – All rights reserved

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/IEC TS 22237-1:2018, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

ISO/IEC TS 22237-2, *Information technology — Data centre facilities and infrastructures — Part 2: Building construction*

ISO/IEC TS 22237-3, *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*

ISO/IEC TS 22237-4, *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control*

ISO/IEC TS 22237-5, *Information technology — Data centre facilities and infrastructures — Part 5: Telecommunications cabling infrastructure*

ISO/IEC TS 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TS 22237-1 to ISO/IEC TS 22237-6 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
availability management
process for monitoring, analysis, reporting and improvement of availability

3.1.2
capacity management
process for monitoring, analysis, reporting and improvement of capacity

3.1.3
change management
process for recording, coordination, approval and monitoring of all changes

3.1.4
configuration item
entity managed by configuration management

3.1.5
configuration management
process for logging and monitoring of configuration items

3.1.6
cost distribution model
model to distribute costs that cannot be directly related to an infrastructure item

© ISO/IEC 2018 – All rights reserved

3.1.7
cost management
process for monitoring, analysis and reporting of all infrastructure related costs

3.1.8
customer management
process for management of customer's responsibilities

3.1.9
data centre strategy
process for alignment of actual data centre's capabilities and future demands of data centre's users and owners

3.1.10
energy management
process for monitoring, analysis, reporting and improvement of energy efficiency

3.1.11
incident management
process for responding to unplanned events and recovery of normal operation state

3.1.12
incident severity
incident category according to the four impact categories described in ISO/IEC TS 22237-1:2018, 5.3

3.1.13
key performance indicator
parameter used to evaluate performance

3.1.14
operations management
process for infrastructure maintenance, monitoring and event management

3.1.15
product lifecycle management
process for managing the timely renewal of infrastructure components and review of product lifecycle costs

3.1.16
provisioned capacity
capacity of the data centre's actual installed infrastructure

3.1.17
security incident
unplanned event resulting in an actual or potential breach of security

3.1.18
security management
process for design and monitoring of security policies, analysis, reporting and improvement of security

3.1.19
service level management
process for monitoring, analysis and reporting of service level compliance

3.1.20
service level agreement
agreement defining the content and quality of the service to be delivered and the timescale in which it is to be delivered

© ISO/IEC 2018 – All rights reserved

3.1.21
total capacity
maximum capacity the data centre was designed for at full use in terms of e.g. space, power and cooling

3.1.22
used capacity
data centre's actual capacity used by the IT and facility in terms of e.g. space, power and cooling

3.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC TS 22237-1 and the following apply:

CRAC	Computer Room Air Conditioning
CUE	Carbon Usage Effectiveness
EER	Energy Efficiency Ratio
ERE	Energy Re-use Efficiency
HVAC	Heating, Ventilation and Air Conditioning
IST	Integrated Systems Test
KPI	Key Performance Indicator
PUE	Power Usage Effectiveness[a]
pPUE	Partial Power Usage Effectiveness[a]
REF	Renewable Energy Factor
SLA	Service Level Agreement
TCO	Total Cost of Ownership
WRE	Water Re-use Effectiveness
WUE	Water Usage Effectiveness

[a] It is recognized that the term "efficiency" should be employed for PUE but "effectiveness" provides continuity with earlier market recognition of the term.

4 Conformance

For a data centre to conform to this document it shall have:

a) an implemented data centre strategy defined by stated business requirements;

b) an implemented set of service management policies and procedures covering the following:

   1) operations management;

   2) incident management;

   3) security management;

   4) customer management;

c) a monitored PUE KPI;

© ISO/IEC 2018 – All rights reserved