



BSI Standards Publication

Video surveillance systems for use in security applications

Part 4: Application guidelines

National foreword

This British Standard is the UK implementation of EN IEC 62676-4:2025. It is identical to IEC 62676-4:2025. It supersedes BS EN 62676-4:2015, which will be withdrawn on 30 November 2028.

The UK participation in its preparation was entrusted to Technical Committee GW/1/10, Video Surveillance Systems (VSS), commonly known as CCTV.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Amendments/corrigenda issued since publication

Date	Text affected
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English Version

Video surveillance systems for use in security applications - Part
4: Application guidelines
(IEC 62676-4:2025)

Systèmes de vidéosurveillance destinés à être utilisés dans
les applications de sécurité - Partie 4: Directives
d'application
(IEC 62676-4:2025)

Videoüberwachungsanlagen für Sicherungsanwendungen -
Teil 4: Anwendungsregeln
(IEC 62676-4:2025)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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European foreword

The text of document 79/727/FDIS, future edition 2 of IEC 62676-4, prepared by TC 79 "Alarm and electronic security systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62676-4:2025.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2026-11-30 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2028-11-30 document have to be withdrawn

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The text of the International Standard IEC 62676-4:2025 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 31010	NOTE	Approved as EN IEC 31010
IEC 62305 (series)	NOTE	Approved as EN IEC 62305 (series)
IEC 62305-3	NOTE	Approved as EN IEC 62305-3
IEC 62305-4	NOTE	Approved as EN IEC 62305-4
IEC 62676-2-11	NOTE	Approved as EN IEC 62676-2-11
IEC 62676-2-31	NOTE	Approved as EN IEC 62676-2-31
IEC 62676-2-32	NOTE	Approved as EN IEC 62676-2-32
IEC 62676-2-33	NOTE	Approved as EN IEC 62676-2-33
IEC 62676-5:2018	NOTE	Approved as EN IEC 62676-5:2018 (not modified)

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62676-1-1	2013	Video surveillance systems for use in security applications - Part 1-1: System requirements - General	EN 62676-1-1	2014
-	-		+ AC	2014
IEC 62676-1-2	2013	Video surveillance systems for use in security applications - Part 1-2: System requirements - Performance requirements for video transmission	EN 62676-1-2	2014
-	-		+ AC	2015
IEC 62676-2	series	Video surveillance systems for use in security applications - Part 2-1: Video transmission protocols - General requirements	EN 62676-2	series
IEC 62676-2-1	-	Video surveillance systems for use in security applications - Part 2-1: Video transmission protocols - General requirements	EN 62676-2-1	-
IEC 62676-3	-	Video surveillance systems for use in security applications - Part 3: Analog and digital video interfaces	EN 62676-3	-
IEC 62820-2	-	Building intercom systems - Part 2: Requirements for advanced security building intercom systems (ASBIS)	EN IEC 62820-2	-
IEC 62820-3-2	-	Building intercom systems - Part 3-2: Application guidelines - Advanced security building intercom systems (ASBIS)	EN IEC 62820-3-2	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

Video surveillance systems for use in security applications - Part 4: Application guidelines

FOREWORD

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IEC 62676-4 has been prepared by IEC technical committee 79: Alarm and electronic security systems. It is an International Standard.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) implementing request for define a security concept (instead of just a risk analysis) (4.2);
- b) selection of security grades (4.2.3);

- c) complete redefinition of pixel densities (6.7) including new test charts (Annex C):
 - upgrade of previous MDORII system with 6 pixel densities (12,5 pixels/meter; 25 pixels/meter; 62,5 pixels/meter; 125 pixels/meter; 250 pixels/meter; 1 000 pixels/meter) into new O2DCPVS system with 7 pixel densities (20 pixels/meter; 40 pixels/meter; 80 pixels/meter; 125 pixels/meter; 250 pixels/meter; 500 pixels/meter; 1 500 pixels/meter)
- d) operation of VSS (Clause 17);
- e) security grading by size view (Annex D, Table D.2);
- f) security grading by application (Annex D, Table D.3);
- g) security grading by critical infrastructure (Annex D, Table D.4);
- h) tables for number of frames depending on object speed (Annex D, Table D.5 and Table D.6);
- i) general updates of tables in entire document.

The text of this International Standard is based on the following documents:

Draft	Report on voting
79/727/FDIS	79/732/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English

A list of all parts in the IEC 62676 series, published under the general title *Video surveillance systems for use in security applications*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

1 Scope

This part of IEC 62676 describes the planning, design, installation, testing, commissioning, and maintaining of video surveillance systems (VSS) comprising image capture device(s), interconnection(s) and image handling device(s), for use in security applications within private or public spaces.

The objectives of this document are to:

- a) provide a framework to assist all interested parties in establishing their requirements,
- b) assist specifiers and users in determining the appropriate equipment required for a given application,
- c) provide means of evaluating objectively the performance of the VSS.

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.

IEC 62676-1-1:2013, *Video surveillance systems for use in security applications - Part 1-1: System requirements - General*

IEC 62676-1-2:2013, *Video surveillance systems for use in security applications - Part 1-2: System requirements - Performance requirements for video transmission*

IEC 62676-2 (all parts), *Video surveillance systems for use in security applications - Part 2-X: Video transmission protocols*

IEC 62676-2-1, *Video surveillance systems for use in security applications - Part 2-1: Video transmission protocols - General requirements*

IEC 62676-3, *Video surveillance systems for use in security applications - Part 3: Analog and digital video interfaces*

IEC 62820-2, *Building intercom systems - Part 2: Requirements for advanced security building intercom systems (ASBIS)*

IEC 62820-3-2, *Building intercom systems - Part 3-2: Application guidelines - Advanced security building intercom systems (ASBIS)*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1**4K****UHD**

standard for ultra high-definition television (UHDTV) defined by SMPTE 2036 to be with 3 840 pixels × 2 160 pixels at 25 fps or 30 fps

3.1.2**8K****UHD**

standard for ultra high-definition television (UHDTV) defined by SMPTE 2036 to be with 7 680 pixels × 4 320 pixels at 25 fps or 30 fps

3.1.3**at-site visual check**

activity to determine and assess the feasibility of implementing the safety concept per camera location to be monitored as well as checks of visible disturbances and defects at site on the monitoring tasks of a VSS that are not evaluated operationally and whether there are deviations from the function of the VSS required in the safety concept

Note 1 to entry: In particular for influences occurring outside of VSS system parts.

Note 2 to entry: The at-site visual check is the responsibility of the operator, who can, however, hand over the inspection to a competent person VSS or to a competent system engineer VSS.

3.1.4**camera housing**

enclosure to provide both physical and environmental protection of the camera, lens and ancillary equipment

3.1.5**camera sensitivity**

image capturing device capability to produce an image in certain light conditions

3.1.6**characterise**

defined functional purpose of a VSS camera to enable characterisation of a target, e.g. person (type of person, gait and action can be characterised) and vehicles (vehicle brand can be characterised) with a pixel density of > 250 pixels/meter

3.1.7**competent person VSS**

person who has been instructed by a competent system engineer VSS about the assigned tasks within the scope of the on-site check and the possible dangers and consequences of improper behaviour

Note 1 to entry: This includes the necessary knowledge for the assessment of the object requirements, with regard to the type of danger and the required function of the VSS, the influence of the use as well as the limits of use and the instruction about the security concept of the video surveillance system, about existing requirements as well as legal requirements or requirements of the operator from safety aspects as personal and property protection measures or to avoid personal injury.

Note 2 to entry: The task requires competences for independent planning and processing of the requirements from the at-site visual check as well as in-depth general knowledge and specialist theoretical knowledge in order to be able to assess to what extent environmental or object changes can influence the effectiveness of a video surveillance system. The recognition of possible interactions from other requirements as well as the development of alternative actions is necessary. Detected deviations shall be securely justified, responsibly communicated and, if necessary, retracted if no other problem solutions can be found.

3.1.8**competent system engineer VSS**

person who, on the basis of professional technical training, knowledge and experience as well as knowledge of the relevant standards, regulations and directives, is able to assess the work to be carried out and recognise possible hazards

Note 1 to entry: A competent system engineer VSS can be employed by either an installation company/system integrator company, project planning company or at owner or at user of the VSS.

Note 2 to entry: For the field of video surveillance systems, training from the spectrum of electrical engineering in the field of communications, information, microprocessor, measurement and control or general electrical engineering is required, and experience in the respective other fields as well as system knowledge of video security technology shall be demonstrated. Qualification of competence for VSS knowledge can be proven by training certificates of e.g., local security associations or vendors of VSS.

Note 3 to entry: Several years of activity in the relevant fields of work can also be used to assess the professional training.

Note 4 to entry: The activity requires the ability to independently plan and process comprehensive technical tasks in a complex, specialised, changing environment. Integrated technical knowledge and in-depth theoretical knowledge of the subject shall be available. The scope and limits of the possible applications of a video surveillance system shall be known. A very broad spectrum of specialised cognitive and practical skills is required. Work processes are to be planned in a comprehensive manner and assessed with comprehensive consideration of handling alternatives and interactions with neighbouring areas. The competence to guide others and to support them with well-founded learning guidance shall be given. Interdisciplinary complex issues shall be presented in a structured, target-oriented and addressee-related manner. Own and externally set learning and working goals shall be reflected upon, evaluated, pursued in a self-directed manner and answered.

3.1.9**constant bit rate**

bit rate of a camera stream kept constant regardless of the image quality or movement in the scene

3.1.10**corrective maintenance**

maintenance carried out after failure detection to restore a VSS to a condition in which it can perform its required function

Note 1 to entry: Corrective maintenance corresponds to repair and serves as a corrective measure after a failure has been detected.

3.1.11**discern**

defined functional purpose of a VSS camera to enable discerning of a target, e.g. objects and their movements with a pixel density of > 80 pixels/meter

3.1.12**electronic iris**

automatic electronic shutter which changes the camera sensitivity in relation to the varying light conditions in order to maintain the video output signal within defined limits

3.1.13**electronic shutter**

arrangement in the camera changing its sensitivity by electronically controlling its exposure time

3.1.14**event recording**

event controlled recording or storing of image signals for a pre-determined time

Note 1 to entry: Refers to video recording not to system log of events.

3.1.15**external synchronisation**

method of feeding reference timing signals to all connected devices to ensure that their video output signals are synchronous

3.1.16**focal length***f*

measurement of the converging power of a lens, normally expressed in mm, which can be used to determine the angle of view for a given sensor size

3.1.17**geo data**

digital information assigning a certain spatial location to the earth's surface

3.1.18**High Definition****HD**

contemporary television standard with 1 920 pixels × 1 080 pixels, interlaced (1 080i) or progressive (1 080p), as defined by SMPTE 274, and with 1 280 pixels × 720 pixels, progressive (720p), as defined by SMPTE 296

3.1.19**imaging device**

device that converts an optical image into an electrical signal

3.1.20**imaging device illumination**

level of illumination at the photosensitive surface of the imaging device

3.1.21**improvement**

additions or changes to a VSS that improve the reliability or functional safety of a VSS during operation without changing its original function

Note 1 to entry: An improvement shall be carried out by a competent system engineer VSS and shall be documented in the operating logbook VSS. An improvement can be, for example, a firmware or software update.

3.1.22**inspection (part of preventive maintenance)**

testing for conformity of the relevant characteristics of a VSS by measurement, observation and testing

Note 1 to entry: The checking of all system parts for technical functionality of the VSS is done according to general manufacturer-independent criteria.

Note 2 to entry: An inspection shall be carried out by a competent system engineer VSS and shall be documented in the operating logbook VSS.

3.1.23**instructed person**

person who has been instructed in the tasks required for the operation of a VSS by a competent system engineer VSS and is capable of independently operating the VSS

Note 1 to entry: These tasks include the implementation or initiation of protective measures and other measures to avert danger in the event of shutdown or malfunction of plant components as well as the initiation of fault rectification or maintenance in the event of impairments.

Note 2 to entry: The tasks presuppose the competences to independently fulfil technical requirements in a still manageable field of activity, as well as extended general knowledge and extended expert knowledge with regards to the function of VSS and the organizational measures associated with their operation. Furthermore, it is necessary to always keep the level of knowledge about VSS up to date through independent and responsible learning.

3.1.24**iris**

variable aperture mechanism which regulates the amount of light passing through the lens onto the imaging device of the VSS camera

3.1.25**lens**

optical device for projecting an image of a desired scene onto the photo sensitive surface of the imaging device

3.1.26**maintenance**

combination of all technical and administrative measures during the life cycle of a VSS that serves to maintain or restore it to a functional state so that it can fulfil the required function

Note 1 to entry: Maintenance includes the preventive measures of inspection and service checks as well as the corrective measures of repair and improvement. Maintenance is usually carried out on site; certain maintenance measures can also take place as "remote maintenance" by means of remote access with the consent of the operator. Remote maintenance shall be documented in the operating logbook VSS. Maintenance measures shall be carried out by a competent system engineer VSS.

3.1.27**maintenance company**

company, who employs competent system engineer VSS that can carry out all maintenance measures, at-site visual checks as well as system extensions and modifications and that has a 24/7 on-call service, the necessary spare parts and the required equipment

3.1.28**National Television Systems Committee****NTSC**

US standardisation for analogue television

3.1.29**NTSC resolution**

US standard resolution for analogue television produced by a 525 interlaced scanning system at 29,97 TV frames per second

Note 1 to entry: When digitised, using the ITU-R BT601 recommendation, the NTSC analogue video signal is converted to 720 × 480 pixels at 30 TV frames per second.

3.1.30**ONVIF****Open Network Video Interface Forum**

open industry forum that provides and promotes standardized interfaces for effective interoperability of IP-based physical security products

3.1.31**operating logbook VSS**

logbook handed to the operator by the competent system engineer VSS, in which all activities on the VSS will be continuously recorded during the entire lifecycle of the VSS

Note 1 to entry: This includes, among other things, all briefings, the handover of the VSS, all operating events such as malfunctions, hazard alarms and false alarms as well as their causes, all maintenance carried out (preventive: inspections and service checks as well as corrective: repair) and all modifications and improvements to the VSS.

Note 2 to entry: In the operating logbook VSS, the competent system engineer VSS shall refer to the required at-site visual checks and maintenance as well as to the operator's obligation to keep the logbook. The operating logbook VSS shall be kept by the operator or by an instructed person.

3.1.32
operational requirements
OR

formal written statement of need, justifications and purpose of the proposed VSS

3.1.33
operator

person responsible for the operation of the VSS and for the effectiveness of the VSS as well as for scheduled, fault-free functioning during the lifecycle of the VSS

Note 1 to entry: The operator is responsible for regular at-site visual check and maintenance of the VSS. The term operator is used because the owner of the building/property does not have to be the user of the VSS at the same time

3.1.34
outline

defined functional purpose of a camera to enable outlining of a target, e.g. objects and their movements with a pixel density of > 40 pixels/meter

3.1.35
overview

defined functional purpose of a camera to enable overview of a target, e.g. objects and their movements with a pixel density of > 20 pixels/meter

3.1.36
PAL

Phase Alternating Line

European based standardisation for analogue television

3.1.37
PAL resolution

European standard resolution for analogue television produced by a 625 interlaced scanning system at 25 TV frames per second

Note 1 to entry: When digitised, using the ITU-R BT601 recommendation, the PAL analogue video signal is represented with 720 pixels × 576 pixels at 25 TV frames per second

3.1.38
pan and tilt unit

motorised unit permitting the horizontal and vertical positioning of the camera equipment

3.1.39
pan, tilt, zoom
PTZ

function of a camera control permitting the horizontal, vertical positioning of the camera together with the variation of the focal length of the lens

3.1.40
perceive

defined functional purpose of a camera to enable perceiving of a target, e.g. objects and their movements with a pixel density of > 125 pixels/meter

3.1.41
picture storage

storing of still or video images

3.1.42**pixel density**

parameter which refers to the number of pixels at the object location (focused area), per unit length (pix/m)

Note 1 to entry: The parameter is universal as it includes the variables of the sensor size, pixel count, lens focal length and the distance to the object.

3.1.43**preventive maintenance**

maintenance to assess and reduce the probability of failure of a VSS

Note 1 to entry: Preventive maintenance includes inspection and service checks of a VSS and serves as preventive measures before a failure is detected.

3.1.44**reaction time**

time span between the recognition of a certain reaction cause and the start of the (defensive) action directed towards it

3.1.45**repair (corrective maintenance)**

physical measure carried out to restore the function of a faulty VSS through fault location, fault diagnosis and repair

Note 1 to entry: If it is determined during an inspection or service checks that the required function of the VSS or individual system parts is no longer ensured until the next inspection or that the required function cannot be fulfilled due to a malfunction, a repair shall be carried out immediately and coordinated with the operator. Repairs shall be carried out by a competent system engineer VSS and shall be documented in the operating logbook VSS.

3.1.46**resistance time**

value, given in units of time, for which a security product or a building element, such as window, door, a wall, ceiling or floor, resists a defined attack, depending on the respective resistance value

3.1.47**resistance value**

resistance class or measure given in an abstract unit for the resistance of a security product or also of a building element, such as window, door, a wall, ceiling or floor

3.1.48**risk assessment**

determination and evaluation of the identified risks for the object or the relevant assets, such as theft of material assets and know-how, personal protection, vandalism, sabotage, interruption of operations, etc.

3.1.49**scene illumination**

level of illumination on the area to be kept under surveillance, measured in lux

3.1.50**SDTV****Standard Definition Television**

standard describing image format of 720 pixels × 480 pixels or 720 pixels × 576 pixels described in SMPTE ST 125:2013

Note 1 to entry: It is sometimes shortened to "SD".

3.1.51

scrutinise

defined functional purpose of a camera to enable scrutinising of a target, e.g. persons identifiable with a probability bordering on certainty, vehicle recognition according to model/year of construction, undoubted vehicle number plate recognition with a pixel density of > 1 500 pixels/meter

3.1.52

security concept

entirety of identified risks and hazards in connection with the specified organisational, personnel, technical and structural measures to secure an installation and to avert hazards

3.1.53

security grade

grade of security on the basis of the risk assessment carried out

3.1.54

service checks (part of preventive maintenance)

general care, adjustments, cleaning and replacement of system parts of a VSS according to the manufacturer's instructions, i.e. primarily implementation of manufacturer-specific measures and activities taking into account the special operating environment conditions

Note 1 to entry: Service checks shall be carried out by a competent system engineer VSS and shall be documented in the operating logbook VSS.

3.1.55

service level agreement

SLA

agreement between the end user and installer covering the operation and maintenance of the installation

3.1.56

site plan

map or pictorial representation of the protected area showing the intended views of the VSS cameras and their locations

3.1.57

system design proposal

SDP

design proposal that shows the elements of a video surveillance system, equipment installation location, physical interconnection and networking, suggested visual coverage, storage calculation and control room layout design

3.1.58

validate

defined functional purpose of a camera to enable validation of a target, e.g. recognition of known persons, actions can be reconstructed, vehicle registration numbers can be partially reconstructed with a pixel density of > 500 pixels/meter

3.1.59

variable bit rate

VBR

bit rate for the camera stream which is constantly changing during the encoding process, due to changes in the scene

3.1.60

video signal

electronic representation of the motion video captured on an imaging sensor

3.1.61

video signal amplitude

magnitude of the video signal expressed in Volts

3.1.62

video signal presentation device

device for converting video signals into pictures on a display screen

3.1.63

VSCC

device for receiving, processing, controlling, displaying, storing, export and forwarding all video signals and information

3.1.64

VSCC room

room or enclosure containing the VSCC within a room in a building

Note 1 to entry: This covers a small office to a full-scale control room environment.

3.1.65

VSS

video surveillance system

system consisting of camera equipment, monitoring and associated equipment for transmission and controlling purposes, which is necessary for the surveillance of a protected area

Note 1 to entry: Previously referred to as CCTV.

3.1.66

VSS camera

unit containing an imaging device producing a video signal from an optical image

3.1.67

VSS camera equipment

unit containing a VSS camera plus appropriate lens and necessary ancillary equipment

3.1.68

VSS control unit

equipment for controlling and monitoring the required operational functions of the VSS

3.1.69

VSS surveillance installation

installation consisting of the hardware and software components of a VSS, fully installed and operational for monitoring a defined security zone

3.1.70

zoom lens

lens with variable focal length and therefore variable angle of view

3.2 Abbreviated terms

For the purposes of this document, the following abbreviations apply.

4K	Acronym for Ultra High Definition TV (UHDTV) with 3 840 pixels × 2 160 pixels
8K	Acronym for Ultra High Definition TV (UHDTV) with 7 680 pixels × 4 320 pixel
AMC	Alarm monitoring Centre
ASB	Anti-social behaviour
ATM	Automatic teller machine
BNC	Bayonet Neill–Concelmann (connector)
CBR	Constant bit rate
CCTV	Closed circuit television, old term for VSS
CRT	Cathode ray tube
DPM	Disruptive pattern material
DVR	Digital video recorder
FAT	Factory acceptance test
FHD	Full HD
fps	Frames per second
Gbps	Gigabits per second
H.26x	Covers both H.264 and H.265 advanced video coding format
HD	High definition
HDD	Hard disk drive
HPDO	High pixel density object – reflects to HPDO test chart
IP	Internet protocol
ips	Images per second
IR	Infrared
JPEG	Joint Pictures Expert Group
LCD	Liquid crystal display
LPDO	Low pixel density object – reflects to LPDO test chart
Mbps	Megabits per second
M-JPEG	Motion JPEG
MPEG	Motion Picture Experts Group
NTP	Network time protocol
NVR	Network video recorder
ONVIF	Open Network Video Interface Forum
OLED	Organic LED
OR	Operational requirement
PoE	Power over Ethernet
POS	Point of sale
pps	Pictures per second
PTZ	Pan tilt zoom
RF	Radio frequency
RTSP	Real time stream control protocol

SD	Standard Definition (576i for PAL; 480i for NTSC)
SDP	System design proposal
SG	Security grade
SSD	Solid state drive
SXGA	Super eXtended graphics adapter
TCP/IP	Transmission control protocol / Internet protocol
UAT	User acceptance testing
UDP	User datagram protocol
UHD	Ultra High Definition
UPS	Uninterruptible power supply
UTC	Universal time coordinated
UV	Ultraviolet
UWQHD	Ultra wide quad HD
VBR	Variable bit rate
VCA	Video content analysis
VMD	Video motion detection
VMS	Video management system
VRN	Vehicle registration number
VSCC	Video surveillance control centre
VSS	Video surveillance system
WORM	Write once read many
XGA	Extended graphic adapter

4 Planning considerations

4.1 General considerations

A VSS is the combination of image capture devices, lighting, interconnections, image handling devices, etc. selected and installed to meet the operational requirements (OR).

VSS shall only be planned, installed, extended, modified and maintained by a competent system engineer VSS.

Figure 1 below is showing the application guidelines as a process visualization (the numbers in brackets are showing the clause/subclause numbers):

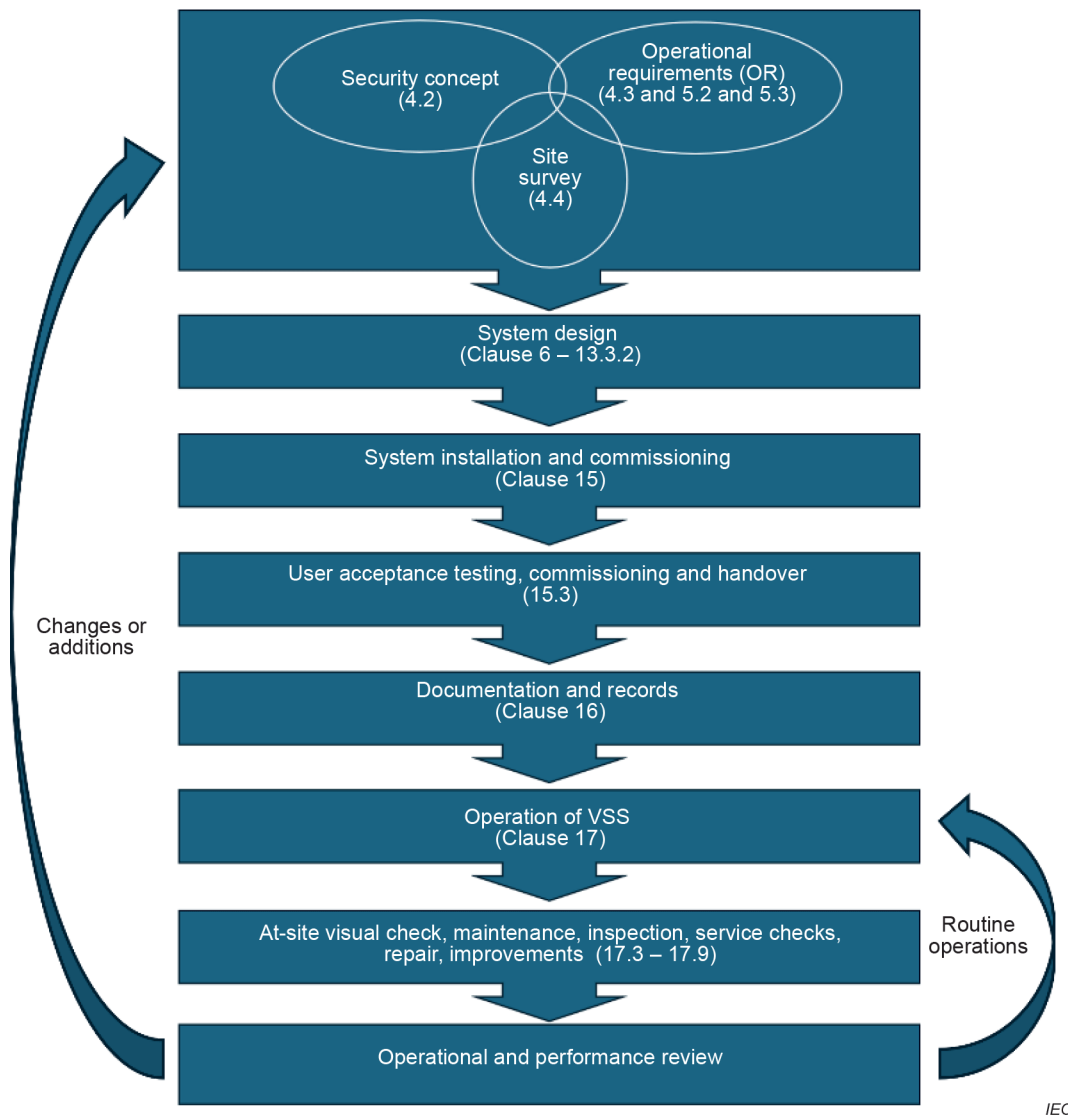


Figure 1 – Process visualization

The recommended procedure for implementing a VSS is detailed in the following subclauses.

4.2 Security concept

4.2.1 General

The basis for planning of a VSS is a security concept, which shall be documented in a suitable form and updated as part of the system documentation. The end user or operator is responsible for the security concept and needs to declare in written form to project planners or competent system engineers VSS, in case the end user/operator wants to omit the security concept.

The end user or operator defines the measures together with the responsible bodies and project participants, e.g. planners, authorities, insurers, competent system engineers VSS, etc. A prerequisite for the creation of a security concept is a threat analysis and definition of protection goals carried out by the end user/operator or a commissioned body, e.g. specialist planners, experts, etc. This is necessary for the definition of the operating requirements. This is to be used for the determination of the operational requirements (OR).

The security concept shall include the VSS as part of a three-pronged security strategy. The strategy consists of:

- structural-mechanical measures to achieve a sufficient resistance time value;
- electronic measures, including the VSS and e.g. lightning protection;
- organisational measures to support safe and, if necessary, false-alarm-free operation and to react appropriately to the situation in the event of certain occurrences, such as alarms and malfunctions, but also substitute measures in the event of shutdowns and malfunctions.

The security concept shall describe the interaction of the three strategic components in relation to the specific circumstances and measures.

The structure of a security concept should follow the sequence in Figure 2.

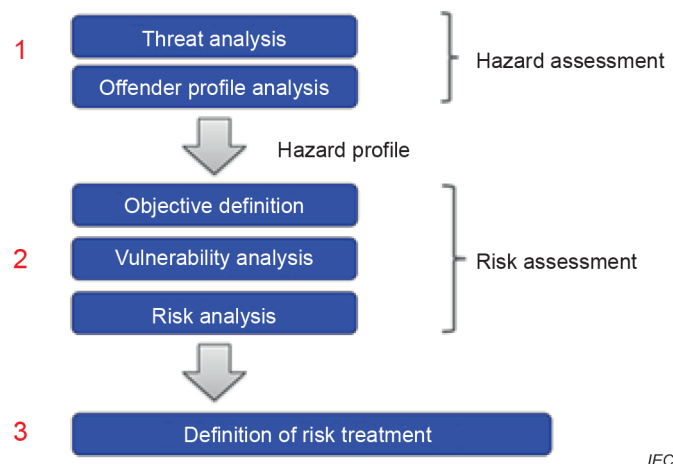


Figure 2 – Structure of a security concept

NOTE Further detailed information on the preparation of security concepts and risk management can be found in ISO 31000 (risk management guidelines) and IEC 31010 (risk management – risk assessment techniques).

4.2.2 Risk assessment

Prior to the VSS design and to support the understanding of its purpose, a threat analysis and a risk analysis (see Figure 2) should be carried out as part of the preparation of a security concept. The threats and risks to the object should be identified and assessed in terms of their likelihood and impact. These represent the risk to the object or organisation.

A risk assessment should be carried out by specialized risk assessment professionals and the VSS should be designed to mitigate the assessed risks. VSS designs should be carried out in accordance with this document.

There is no single model design for a VSS. The design should be based on the individual site and object, the threats and content of those sites and the expected threats and damage.

Examples of issues to be considered are listed below:

a) Cost of loss:

- 1) What is the value, e.g. financially, intellectually, etc. of the assets at site?
- 2) What is the consequence of interruption of work/business at site?

- b) Location:
 - 1) What is the quality and extent of any existing physical security?
 - 2) Is the site located in a high crime area?
 - 3) Are there any adverse environmental conditions?
 - 4) How long does it take to get intervention forces to the site?
 - 5) Does the public have access to the site/location?
- c) Staffing:
 - 1) Is the site unoccupied for extended periods?
 - 2) Are there security staff?
- d) Theft, robbery and threat history:
 - 1) Is there a history of theft, robbery or threats at site?
 - 2) If so, what were the methods of attack of the previous threat?

Results of this assessment will be used to contribute to decisions regarding the type of VSS to be specified and subsequently installed.

4.2.3 Selection of security grades

The results of the risk assessment (see 4.2.1) should be used to determine the requirements of the VSS and its components. Where appropriate a security grade should be assigned.

The security gradings can be defined by different methods as shown below:

- 1) Security grade definition applied to the entire VSS (same grade) or different gradings to sub-systems (system view).
- 2) Security grade definition applied to the size of VSS (size view).
- 3) Security grade definition applied to the application/vertical within the VSS is being used (application view).
- 4) Security grade definition applied to the functions within the VSS (function view).

The identified security grade requirements should be specified in the operational requirement (OR) or system design proposal (SDP) and agreed by the customer and system designer.

IEC 62676-1-1 defined the following functions within VSS.

Depending on the level of risk, the security grade needs to be defined for the following VSS functions:

- a) common interconnections;
- b) storage;
- c) archiving and backup;
- d) alarm related information;
- e) system logs;
- f) backup and restore of system data;
- g) repetitive failure notification;
- h) image handling device PSU monitoring;
- i) image buffer holding time;
- j) essential function device failure notification time;
- k) monitoring of interconnections;
- l) tamper detection;

- m) authorisation code requirements;
- n) time synchronisation;
- o) data authentication;
- p) export/copy authentication;
- q) data labelling;
- r) data (manipulation) protection.

Individual functions of the VSS can be specified at different security grades: for example, a system generally specified at grade 1 with grade 4 storage including fail-safe image storage.

Any additional functions which are required above the security level can be defined individually in the OR or SDP.

Further information for security grading examples refer to Annex D.

4.3 Developing the operational requirements

The OR document shall be produced. This is a formal written statement of need, justifications and purpose of the proposed VSS. The installer should assess and determine whether production of the OR is to be completed before or after the site survey. See 5.2 and 5.3 for more details.

4.4 Site survey

Once a location has been chosen for a VSS installation a site survey should be undertaken. This is to familiarise the system designer with the specifics of the intended site, such as access constraints, siting of key components (cameras, controls, power supplies, etc.) and environmental factors including illumination in day and night mode (see Clause 6 for more details).

This should be completed by visiting the location to assess its suitability, and to note any issues for the system design phase.

If the location where the VSS is to be installed has not yet been constructed, then the site survey can be carried out after a preliminary design has been created.

4.5 Security of the VSCC room

The VSCC shall be protected by means of structural, mechanical, electronic, organisational and, if necessary, personnel security measures, depending on the security concept and the resulting security grading.

The risk assessment, OR and site survey should be used along with stakeholder input to ensure that suitable security measures are implemented to protect the VSCC from unauthorised access, sabotage, vandalism and manipulation.

The enclosure components of the VSCC room or the housing in which the central components of the VSS are located shall have sufficient structural or mechanical resistance in accordance with the results of the risk assessment. In addition, breakthrough monitoring with suitable sensors or detectors (e.g. area monitoring) should be required.

Depending on the security grading, the VSCC room or the enclosure should also have an opening and closing contact monitoring system for the doors (access door, openings as side panels of the enclosure, etc.) with logging.

At grade 4, the VSCC room should be equipped with an intrusion alarm system that ensures monitoring of opening, closure and breakthrough as well as monitoring of the interior.

In this regard, suitable organisational security measures, such as alarm transmission and intervention by security staff, shall be defined. In particular, the failure and sabotage protection of the transmission paths shall be taken into account.

Furthermore, a mechanical, mechatronic or electronic access control system should be required for the VSCC room. The individual measures depending on the security grades can be found in Table 1.

Table 1 – Measures depending on security grades

Measures	SG 1	SG 2	SG 3	SG 4
Structural, mechanical resistance	O	O	X	X
Constructional elements ^a with a high resistance value	O	O	X	-
Constructional elements ^a with a very high resistance value	O	O	O	X
Electronic burglar alarm system	O	O	X	X
Opening and closure monitoring with logging	O	X	X	X
Breakthrough monitoring	O	O	O	X
External triggering, e.g. motion detectors (spatial monitoring)	O	O	X	X
Transmission device to a permanently manned AMC ^b	O	R	X	X
Access control system	O	R	X	X
^a Windows, doors, walls, ceilings, floors ^b Alarm monitoring centre - not permitted X required O optional R recommendation Remark: The term "resistance or resistance value" refers to "breakthrough".				

4.6 System design including site plan

Once the site survey and OR is completed, the VSS can be designed, and a system design proposal and a specification shall be prepared. The design shall take into account the various requirements and location factors identified in the previous stages. At this stage a site plan should be drawn up, including locations for the various key components such as cameras (including field of view), detectors (including range and coverage), control rooms, power supplies, interconnections, etc. See Clause 6 for more details.

4.7 Developing the test plan

Having designed the VSS, a test plan shall be produced to allow any installed system to be suitably proven. This test plan should include all the critical aspects of the VSS, such as image quality, system interconnectivity, coverage, camera view, etc. The purpose is to ensure that the system can be measured against its OR and proved to be fit for its intended purpose. See Clause 13 for more information and 6.11.2 for tamper protection testing.

4.8 Installation, commissioning and hand over

The risk assessment, OR and system design (including a site plan) should all be used to help facilitate the VSS installation.

Having completed the installation, commissioning tests as specified in the test plan should be completed according to the OR.

Once this has been successfully completed the system can be formally handed from the installer to the operator. See Clause 15 for more details.

4.9 Documenting the system

Documentation should be completed supporting the design, installing and commissioning phases of the VSS. These should be collated and held by the operator as the system references. The risk assessment, OR, testing plan, site survey, system design and site plan (see Clause 14 and Clause 16) should be included, along with the following documents:

- testing results, as built plans/drawings, data interface descriptions;
- training, manuals, support documentation, etc.;
- maintenance plan including routine inspection cleaning, etc. (see Clause 17 for more details).

5 Operational requirements specifications

5.1 General

The purpose of the VSS installation shall be summarized in a document called "operational requirements" (OR) or "system design proposal" (SDP).

5.2 Purpose of the operational requirements

The operational requirements clearly state what the customer expects the functions of the system to do. If there is an agreement between the system designer and the customer, the OR could be defined within the system design proposal and specification. If so, this should be clearly stated within the document. The development/design process encourages clear thinking about who will use the VSS, where and when it will be used and, in particular, the purpose of the VSS. It is produced by VSS owners, operators and anyone who intends to use information from the VSS. The latter stages of development of the OR shall involve those with the necessary skills to convert statements into a technical specification and test procedures.

At appropriate stages checks shall be made to ensure that the proposed implementation will meet the OR. Without an OR and a matching test procedure there is no practical methodology to assess whether the system can meet its required purpose.

5.3 Content of the operational requirements

5.3.1 General

The operational requirements shall consist of the following parts.

NOTE Depending on size of object or size of system or application, parts of 5.3 can be irrelevant.

5.3.2 Basic objective/functionalities

The following basic functions shall be included where applicable:

- Intended purpose(s) of the system (e.g. site monitoring, detection, monitoring, recording of attacks against individual and property, thefts, robberies or damage).
- Risk assessment, which informs the selection of the required security grade of the system according to IEC 62676-1-1.

5.3.3 Definition of surveillance limitations

The following limitations shall be included where applicable:

- Country-specific data protection laws (e.g. General Data Protection Regulation – GDPR in Europe) can apply for the planning and operation of VSS. It is advisable to take the country-specific regulations into account already during the planning of the VSS.
- Limitations imposed by city rules or similar orders. National legislation can apply.
- Limitations such as privacy areas required by the operator or by the proximity of neighbours.

5.3.4 Definition of the site(s) under surveillance

Buildings, internal, external or separate areas, small, medium or large private or public spaces, etc. which are covered by the VSS.

5.3.5 Definition of activity to be captured

The following activity definitions shall be covered:

- The intended targets of the system in each part of the site (e.g. unauthorized persons within an area bounded by a perimeter fence; vehicles entering the access driveway, etc.).
- The expected speed of the intended target.
- The intended observation category of the targets from the perspective of the operator (e.g. overview, outline, discern, perceive, characterise, validate, scrutinise of a person).
- Whether external detection is required.

5.3.6 System/picture performance

The following performance parameters shall be included where applicable:

- The key performance characteristics of the system and its displayed images (e.g. timescale for operator to view persons and track their movements throughout the scene).
- The degree of image detail required for the purpose which is to be observed in each of the live, recorded and exported views (i.e. it can be desirable or appropriate for a different resolution to be used in the live view than in the recorded view).
- Definition of any image analysis functionality, together with expected accuracy and whether this is to be achieved by the operator or automatically by the system.

5.3.7 Period of operation

The following operation parameters shall be included where applicable:

- Definition of the operating hours for the system (e.g. daily between 21:00 and 08:00 and all day on Sundays and public holidays).

5.3.8 Conditions at the location

Definition of environmental conditions, which will apply and vary during the monitoring period and are significant in terms of system design (e.g. illumination of the site, potential obstacles in camera view, maximum and minimum temperatures, on-board).

5.3.9 Resilience

Definition of the ability of the system to continue operating despite the existence of adverse circumstances (e.g. ability to continue operating during sudden or unexpected loss of power for a significant or defined length of time, absence of single interconnection paths, whether all or parts of the system have the same requirement).