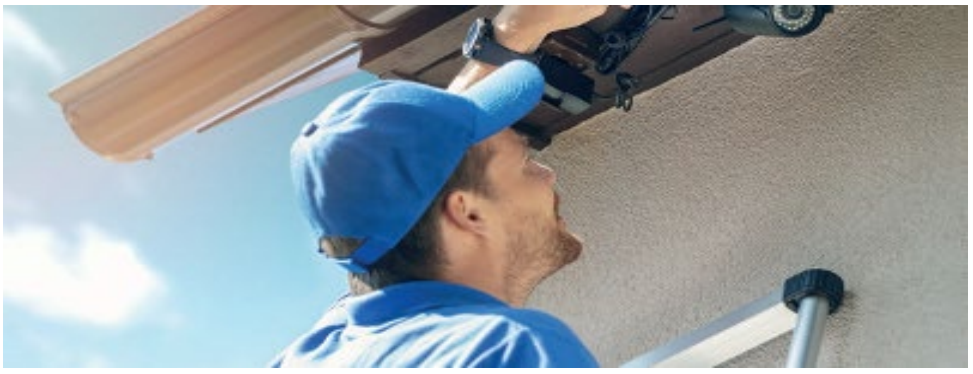

Form 218

Graded requirements under BS EN 62676 standards for Video Surveillance Systems

- a technical guide for installers, specifiers and manufacturers

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Contents

Introduction

The BS EN 62676 series of standards for video surveillance systems (VSS) are used to a significant extent in the UK and include the use of security grading. This guide is intended to assist installers of VSS and others to understand how a choice of grade is to be made and then used to determine the design requirements of a VSS.

It is important to understand that the majority of requirements given by the BS EN 62676 series of standards are not grade dependent. This guide deals only with the requirements that are grade dependent. Most of the grade dependent requirements are to be found in BS EN 62676-1-1 but there are a few in BS EN 62676-1-2 (the names of the standards can be found in 2.1).

The approach to grading given in the BS EN 62676 series of standards is intended to allow for flexibility to overcome problems that a system designer may face. It is not intended to be complicated, but the flexibility can give the appearance of complexity. Having an understanding of the flexible possibilities will benefit system designers whether they choose to use them or not.

A summary of the key points about grading detailed in this document are:

- System designers should choose the simplest approach that will work.
- The recommended approach is to choose a grade of system and apply that single grade throughout the system.
- The grading will affect the protection level and restriction of access to the system.
- It is the functions of the VSS that are graded rather than each component.
- Grading of a system does not determine the quality of the images captured by the system. BS EN 62676-4 and BS EN IEC 62676-5 includes requirements and recommendations that impact on the quality of image recording.
- The chosen grade(s) should be recorded in the Operational Requirement (OR) or System Design Proposal (SDP).
- Where use of a single grade for all system functions is not practical the standard permits the grading to be divided up by function. 18 Functions are described in the standard.
- Additional flexibility can be obtained by documenting specific requirements in the OR or SDP.

Note: *For security practitioners with a knowledge of intruder alarms systems (as installed under the PD 6662 scheme) it is important to note that the way that grading is described in the VSS standards is not the same, it is therefore important to understand the differences. Additionally for intruder alarm systems the installer's life is made easy by the existence of component standards. For example an installer seeking a grade 3 passive infra-red detector simply looks for a device that a manufacturer states meets the requirements of the associated standard. This is not the case for VSS, there are currently no standards for VSS components specifying differences between their requirements at each grade.*

1. Scope

These guidelines are for use in conjunction with the BS EN 62676 series of standards for "Video Surveillance Systems for Use in Security Applications". In particular, they give guidance to the requirements in BS EN 62676-1-1 "System Requirements – General".

It is not mandatory to use security grading when installing systems to meet the standard but the use of grading can give benefit and simplify matters.

Grading of a system does not specifically determine the quality of the images captured by the system although implementation of a higher grade may coincidentally result in an improvement. The grading will affect the protection level and restriction of access to the system.

Note: *The VSS standards are referred to generically in this guide as 'the BS EN 62676 series of standards' even though more recently they are being published as BS EN IEC 62676 standards. The generic term 'BS EN 62676 series of standards' means all of the suite including those referenced as BS EN IEC 62676 standards.*

Note: *The BS EN 62676 series of standards uses the term Video Surveillance System (VSS) for systems also known in the UK as CCTV (Closed Circuit Television) systems.*

2. Referenced documents

2.1. Referenced standards

The following referenced documents are indispensable for the application of this document.

BS EN 62676 series	Video surveillance systems for use in security applications
BS EN 62676-1-1	System requirements. General
BS EN 62676-1-2	System requirements. Performance requirements for video transmission
BS EN 62676-2-1	Video transmission protocols – general requirements
BS EN 62676-2-2	Video transmission protocols – IP interoperability implementation based on HTTP and REST services
BS EN 62676-2-3	Video transmission protocols – IP interoperability implementation based on web services
BS EN 62676-3	Analog and digital video interfaces
BS EN 62676-4	Application guidelines
BS EN IEC 62676-5	Data specifications and image quality performance for camera devices
BS EN IEC 62676-6	Video surveillance systems for use in security applications. Part 6. Video content analytics. Performance testing and grading

2.2. Regulations

There are many regulations that affect the design, installation and maintenance of VSS but none are specifically related to the subject of this guide. For further information refer to BSIA Form 109 – “Planning, design, installation and operation of video surveillance systems code of practice and associated guidance”.

3. Definitions and abbreviations

3.1. Terms and definitions

The BS EN 62676 series of standards include a number of defined terms. Reference should be made to those terms and definitions.

3.2. Abbreviations

AES	Advanced Encryption Standard
BSI	British Standards Institution
BSIA	British Security Industry Association
CCTV	Closed Circuit Television
CENELEC	Comité Européen de Normalisation Électrotechnique; (European Committee for Electrotechnical Standardization)
DVR	Digital Video Recorder
IEC	International Electrotechnical Committee (Worldwide standards body)
IETF	Internet Engineering Taskforce
IP	Internet Protocol or Ingress Protection Rating (according to context)
OR	Operational Requirement
PSU	Power Supply Unit
PTZ	Pan-Tilt-Zoom
RAID	Redundant Array of Independent Disks
RFC	Request for Comment (publication of IETF)
SDP	System Design Proposal
TLS	Transport Layer Security (in this context referring to an IETF protocol)
UTC	Universal Time Coordinated
VSS	Video Surveillance System(s)
VTD	Video Transmission Device(s)

4. How to use this guide

This guide consists of three main sections:

- **Section 6** "Grade selection" explains how the security grade can be applied to all or to parts of the installation.
- **Section 9** "Commentary on the requirements" looks at each of the graded requirements in the standard in turn and gives advice and commentary.
- **Section 10** "Graded requirements" summarises the requirements in a checklist style.

5. How does the customer benefit by the use of grading

This guide is primarily aimed at those wishing to understand the technical issues associated with grading in terms of how the requirements differ by grade and also how to apply the graded requirements to the system. BSIA have a separate guide (Form 217) that is intended to help customers of VSS understand the differences between an installation meeting the requirements of the BS EN 62676 series of standards and other systems (e.g. systems that pre-dated those standards). This includes an overview of the differences introduced by grading.

It is important that the customer appreciates that the choice of one grade over another will not affect the quality of images obtained by the system. The use of different grades will however affect the robustness and integrity of the system and its ability to continue to serve its purpose in the face of a criminal attack or likely fault conditions.

The factors that are affected by the grade choice are indicated by the function titles in section 6.3.1and section 8.

As can be seen by the table in section 8, the majority of differences between system requirements are associated with the step from grade 2 to grade 3. 13 of the 18 functions have identical requirements in grades 1 and 2, and 9 of the 18 are the same in grades 3 and 4.

BS EN 62676-4 describes how the selection of security grades should be based on a risk assessment and the system should be designed to mitigate the assessed risks. As the graded requirements primarily affect the robustness or resilience of the system itself then it is these aspects of a risk assessment that would determine the grade.

Therefore typically the grade will be the result of risks associated with threats and hazards such as:

- Vandalism or malicious attack on the VSS (without other criminal intent).
- Deliberate attack on the VSS (to assist with a crime).
- Environmental factors (e.g. flood damage to equipment, radio interference, lightning) and possible power outages.

A higher risk will be associated with increased likelihoods of events. These may be indicated by:

- How attractive the criminal target is (e.g. valuables / persons at risk of kidnap).
- Lack of other security measures.
- Location in a high crime area or close to easy escape routes.
- Lack of occupancy.
- Easy public access.
- High crime history.

A higher risk will also be associated with a high impact. Many things might cause a high impact, including:

- Potentially high losses.
- Disruption to site activities.

Some aspects of the graded functions do not directly relate to the threat but are a consequence of the risk assessment. An example is the need to preserve evidential data of good quality images. Although this is unlikely to prevent a crime it is more likely to be important when a criminal will go to greater lengths to protect their identity. This is associated with higher risks.

6. Grade selection

6.1. General

The principle of grading in the BS EN 62676 series is to provide a short-hand way to simplify the specification of system requirements, i.e. make it easy to specify functions by identifying the grade dependent requirements as listed in the standard.

For practical purposes system designers should choose the simplest approach that will work. The following sections outline the flexibility that is available but the recommended approach is to choose a grade of system and apply that single grade throughout the system. Only when this will cause problems should it be necessary to consider the alternative possibilities. Having an understanding of these possibilities will benefit system designers whether they choose to use them or not.

Grading of a system does not specifically determine the quality of the images captured by the system although implementation of a higher grade may coincidentally result in an improvement. The grading will affect the **level of protection** (or the robustness and resilience) and **restriction of access to the system**. A higher grade will give the system greater integrity and resilience.

BS EN 62676-4 includes recommendations for installations that should be applied in conjunction with non-graded requirements in BS EN 62676-1-1 to determine the quality of image recording.

The procedures to be followed for an installation are documented in BS EN 62676-4. This includes making the choice of security grade(s). Once a decision has been made regarding the grading of the system BS EN 62676-1-1 includes the requirements that are specific to each grade.

With a surveillance camera system it is the functions of the system that are graded rather than each component.

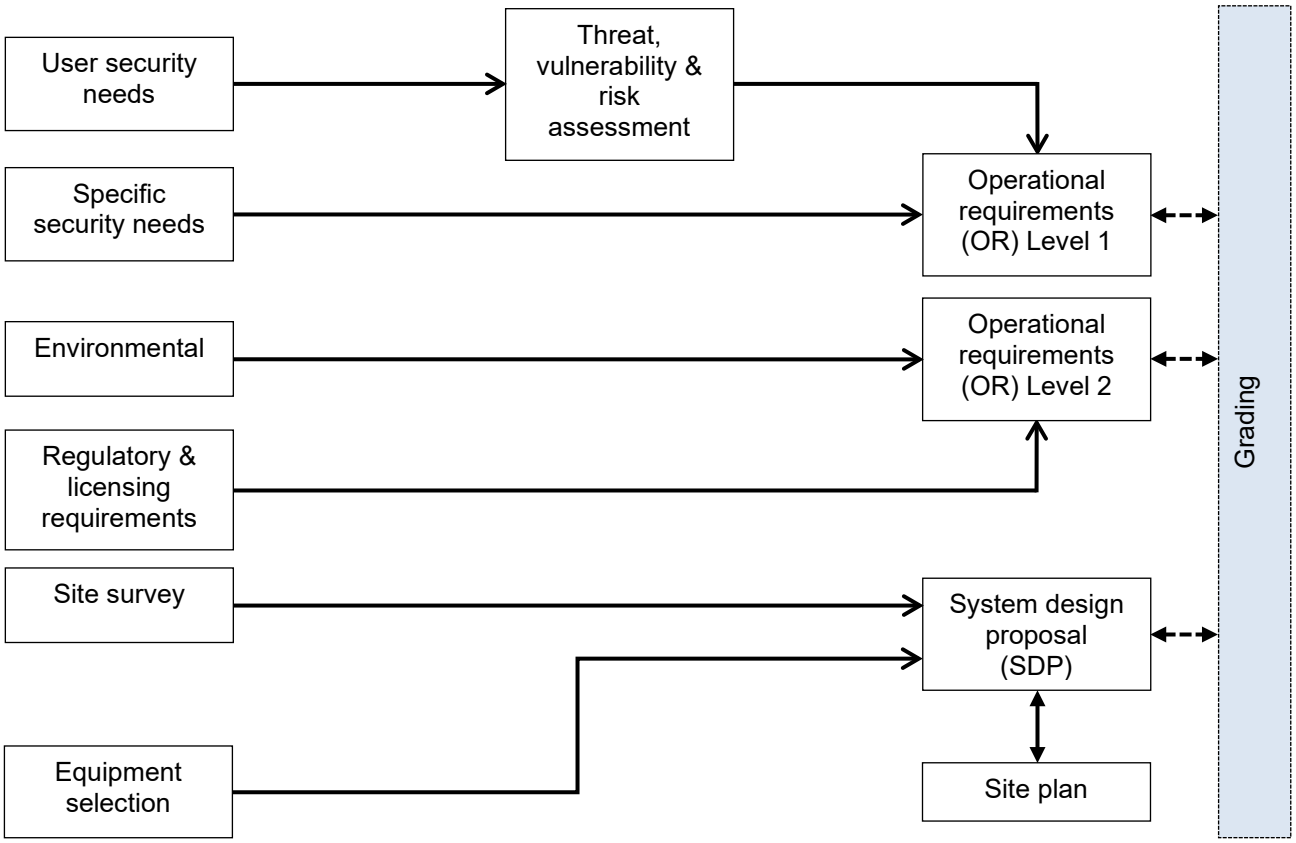
The choice of a grade should be made early in the process as part of the planning stage and the consequences of this selection then influence work during the design stage. See Figure 1.

In choosing the grade or grades of a system it is expected that a threat, vulnerability and risk assessment will have been performed to ensure the design of the system results in an installation that adequately addresses the threats and reduces the security risks. The result of this activity should be recorded in a suitable manner and will inform the design decisions that are made in developing the SDP.

Where possible the use of a single overall grade for all functions of the system is recommended.

Alternatively, if a single grade is inappropriate, the standard permits for the grading to be varied between each of 18 functions (see 6.3.1). For example if the threat being considered is shoplifting then even if this were to result in a grade 4 being applied to say “System logs” then it is unlikely that the grade relating to “data (manipulation) protection” would be grade 4. If however the threat is organised crime at a casino then both may be grade 4.

Figure 1: How Grading fits into the planning and design process



6.2. When is grading necessary?

6.2.1. General

It is a requirement of the standards that *"the system shall be given an overall grade"* and *"the identified security grade requirements should be specified in the OR and agreed by the customer and system designer."* It is also stated that *"where not specified the default security grade is 1."*

There is only one requirement (for labelling with date and time – see Table 11 of BS EN 62676-1-1) that is listed as applying at grade 1 but is not stated to be a requirement of all systems.

The standard does not require grading of systems to be performed in all cases (e.g. see 6.2.2) and it is possible instead to define all requirements by way of the OR or SDP. The use of grading may make it easier to define the system requirements and remove the need for individual consideration of every requirement.

6.2.2. Primary Mitigation

BS EN 62676-1-1 says: *"The security grades shall be applied, where VSS is identified as the primary mitigation of the risk."*

In this context *"mitigation"* means a measure that is put in place to reduce the consequences of a threat. Security is not normally achieved using a single method of mitigation. Instead several methods are often used in combination. For example:

- A good lock on a strong door may delay entry.
- An intruder alarm system may detect entry.
- A VSS may identify the offender (and so may act as a deterrent).
- A security officer responding to the alarm.

A VSS used alongside other methods of mitigation may still be *"Primary mitigation"*.

Whether the system is the primary method of mitigation should be considered on a risk-by-risk basis. For

example in a single system whereas VSS may not be the primary mitigation against burglary (where physical protection and intruder alarm systems are used) it may be the primary mitigation for internal theft or prevention of violence.

VSS that are used for monitoring of people are often used as the primary mitigation. Examples include: public space monitoring; prevention of shoplifting; crowd monitoring; theft from within occupied buildings; shrinkage; casino monitoring; bank-teller and cashier monitoring.

It is important to recognise that in many cases there is a threat to the VSS (e.g. to remove evidence of a crime) and therefore it may be providing primary mitigation against this.

When the VSS is not judged to be the primary mitigation for a risk then it is recommended that the security feature providing primary mitigation is documented.

The use of grading can be a significant advantage and should be considered even if it is judged that the system is not the primary method of mitigation. It provides a clear way of showing differences in the protection level and restriction of access to the system and this will help when discussing proposals with customers.

6.3. How is the grading of a system defined?

6.3.1. General

The recommended approach is to choose a grade of system and apply that single grade throughout the system.

Alternatively it is permitted for each of the functions below to be assigned a different grade. A single piece of equipment may need to provide a number of graded functions.

The list of graded functions is:

1) *Common interconnections*
2) *Storage*
3) *Archiving and backup*
4) *Alarm related information*
5) *System logs*
6) *Backup and restore of system data*
7) *Repetitive failure notification*
8) *Image handling device PSU monitoring*
9) *Image buffer holding time*
10) *Essential function device failure notification time*
11) *Monitoring of interconnections*
12) *Tamper detection*
13) *Authorisation code requirements*
14) *Time synchronisation*
15) *Data authentication*
16) *Export/copy authentication*
17) *Data labelling*
18) *Data (manipulation) protection*

An explanation of these functions can be found in section 9.

6.3.2. Overall Grade and Consistent Use

The standards (both BS EN 62676-1-1 and BS EN 62676-4) say:

The system shall be given an overall grade for which the grade dependent requirements of this standard shall apply. When identified by the OR, or SDP, the functions of the VSS may use a different grade but this shall be applied consistently throughout the system.

If a grade has not been specified BS EN 62676-1-1 also says: *"Where not specified the default security grade is 1"*. So, although the use of grading is effectively optional, all systems must, as a minimum, meet the requirements of grade 1.

When, with the exception of tamper protection and detection, any of the individual functions (the 18 functions listed in 6.3.1) are graded differently to the others then the term "overall system grade" has less meaning but it is still necessary to have one. In this case it is recommended that the "overall system grade" is quoted as the *grade of the majority of the 18 functions*. Tamper protection and detection does not affect the overall system grade (see 6.3.3).

What does *"applied consistently throughout the system"* mean?

If it is not appropriate to use a single overall grade (see 6.3.1) the standard allows for the grading of each of the functions separately. Saying this should be "applied consistently" means that if a different grade is chosen for one function, then it applies to all parts of the system used to achieve that function.

For example if a system which in all other respects is installed to meet grade 2 has a need for "Data authentication" at grade 3 because of a risk affecting one part of the supervised premises then all requirements for that function throughout the system should be at grade 3 but all other functions can remain grade 2.

Note: *There may be occasions where some of the requirements within a specific function are not necessary but have an impact on the system design. Where this is the case, it may be more appropriate to specify this independently of grading (e.g. in the OR or SDP). Refer to 6.3.4.*

6.3.3. Tamper protection and detection requirements

The standard specifically states that the rules for applying consistently do not apply to tamper protection and detection. This is because the risk of parts of the system being tampered may vary with location and it may be impractical to apply the same grade of tamper protection and detection throughout the system.

An assessment of the risk should be made for each location and then dealt with in one of two ways. Either the requirements can be covered by use of grading (e.g. by stating that cameras 1 to 5 need grade 3 tamper detection whereas cameras 6 to 12 are grade 2) or specific requirements can be given in the OR or SDP.

6.3.4. Using the OR or SDP to modify grade requirements

In some cases the use of the rule that graded functions should be applied consistently could result in the installation of systems that are excessively over specified or fail to meet customer requirements.

When this may be the case it is recommended that the grade of the function is chosen to be that applicable to the majority of the system and the OR or SDP used to document specific parts of the system. The detail given in the OR or SDP does not have to be specified in terms of grade.

For example a system could be defined as having storage meeting grade 4 requirements. One of the grade 4 requirements is the ability to replay an image from storage within 1s after the incident or the actual recording of it. However if the use of the system is not going to include continuous monitoring, then this need is unlikely to occur and achieving it could prove onerous. In these circumstances requirement for storage could be defined as grade 4 but a concession given against these criteria.

6.4. Summary of grading

1) System designers should choose the simplest approach that will work.
2) The recommended approach is to choose a grade of system and apply that single grade throughout the system.
3) The grading will affect the protection level and restriction of access to the system.
4) It is the functions of the VSS that are graded rather than each component.
5) Unlike the other functions, tamper protection and detection requirements may be applied with different grades in various locations because of the varying risk of tamper in those locations.
6) Grading of a system does not determine the quality of the images captured by the system. BS EN 62676-4 includes requirements and recommendations that will determine the quality of image recording.
7) VSS are installed to mitigate the risks associated with a number of threats
8) If the mitigation by VSS for a particular threat is not the primary mitigation then grading is optional for that threat but may apply for other threats. If VSS is not the primary mitigation for any threat then grading is optional for the whole system.
9) Grade 1 is the minimum grade that can be assigned.

10) If necessary, any of the 18 functions (listed in 6.3.1) can be graded separately but the grade for that function applies throughout the system.
11) It is recommended that if any of the 18 functions (with the exception of tamper protection and detection) are graded differently the overall system grade be that of the majority of the functional grades chosen.

Note: *In a few cases counting the functions at each grade may result in a simple majority being misleading. For example: If (ignoring tamper detection) a system has 8 functions at grade 2, 5 functions at grade 3 and 4 functions at grade 4 then the grade with the majority of functions is grade 2. However it is clear that 9 functions are of grade 3 or better and therefore this can be given an overall system grade of 3.*

7. How to record grading of systems

7.1. Recording of the grade in VSS documentation

This section provides, by way of examples, an explanation of how the grading may be recorded in the system documentation.

As grading is fundamental to the integrity and resilience of the VSS, it is important that each functional requirement from the standard is identified in the OR document and / or the SDP.

Depending on the site risk, this may be an overall grade or may include variations for specific functions as permitted in the standard. As the grading of tamper can be applied independently to other functional requirements, these may need to be identified on a case-by-case basis.

The examples below show how the grade requirements could be presented in the OR / SDP.

The title of the VSS documentation should include details of the type of system being installed, i.e. “Installed in accordance with BS EN 62676 standards”.

Note: *Whilst it would be plausible to include reference to grade requirements in the title, we would refrain from doing this as grading is not specifically relevant to other important VSS design aspects such as image quality (BE EN 62676-4 refers) and may give the user an incorrect perception that the whole system design is subject to grading requirements.*

Within the OR / SDP there needs to be clarity on how grading is applied and it is recommended that the information shown in the following examples be provided. The first example demonstrates the use of a table format and the second the use of a list. Either of these methods or an alternative is acceptable, but it is recommended that (especially if there are any variants) all of the functions are shown to avoid any confusion.

As the grade of tamper detection and protection can be applied separately due to site specific risks, then these may need to be listed in the documentation (OR or SDP) on a location-by-location basis. See 6.3.3. Alternatively, if a common minimum grade of tamper can be applied then it would be useful to include this in the functional grade lists (this is not shown in the following examples).

7.2. Example 1

A VSS having an overall minimum functional grade of 2 with no variations

For the purposes of the VSS protection level and restriction of access, the security grade of the functions described in BS EN 62676-1-1 are as listed in the following table.

	Description	Grade		Description	Grade
A	Common interconnections	2	J	Essential function device failure notification time	2
B	Storage	2	K	Monitoring of interconnections	2
C	Archiving and backup	2	L	Authorisation code requirements	2
D	Alarm related information	2	M	Time synchronisation	2
E	System logs	2	N	Data authentication	2
F	Backup and restore of system data	2	O	Export/copy authentication	2
G	Repetitive failure notification	2	P	Data labelling	2
H	Image handling device PSU monitoring	2	Q	Data (manipulation) protection	2
I	Image buffer holding time	2			

According to the requirements of BS EN 62676-1-1 the system is considered to have an overall minimum security grade of “2”.

The grade of the tamper detection (and protection) measures is not listed as the grading varies across the system according to the risk in the locality of the equipment. The tamper detection and protection provided is documented elsewhere.

7.3. Example 2

A VSS having an overall minimum functional grade of 2 but where some functions have a different grade

For the purposes of the VSS protection level and restriction of access, the security grade of the functions described in BS EN 62676-1-1 are as listed in the following table.

A.	Common interconnections	Grade “2”
B.	Storage	**Grade “3”**
C.	Archiving and backup	Grade “2”
D.	Alarm related information	Grade “2”
E.	System logs	Grade “2”
F.	Backup and restore of system data	Grade “2”
G.	Repetitive failure notification	Grade “2”
H.	Image handling device PSU monitoring	Grade “2”
I.	Image buffer holding time	Grade “2”
J.	Essential function device failure notification time	Grade “2”
K.	Monitoring of interconnections	Grade “2”
L.	Authorisation code requirements	Grade “2”
M.	Time synchronisation	Grade “2”
N.	Data authentication	Grade “2”
O.	Export/copy authentication	Grade “2”
P.	Data labelling	Grade “2”
Q.	Data (manipulation) protection	**Grade “4”**

According to the requirements of BS EN 62676-1-1 the system is considered to have an overall security grade of “2”.

The grade of the tamper detection (and protection) measures is not listed as the grading varies across the system according to the risk in the locality of the equipment. The tamper detection and protection provided is documented elsewhere.

Note: *For the purposes of clarity this may be recorded as "overall system grade 2 (with variances as recorded)".*

7.4. Example 3

A VSS having an overall system grade of 3 with a need to highlight functions that cannot be applied consistently

For the purposes of the VSS protection level and restriction of access, the security grade of the functions described in BS EN 62676-1-1 are as listed in the following table.

	Description	Grade		Description	Grade
A	Common interconnections	2	J	Essential function device failure notification time	3
B	Storage	2*	K	Monitoring of interconnections	3
C	Archiving and backup	3	L	Authorisation code requirements	3
D	Alarm related information	3	M	Time synchronisation	3
E	System logs	3	N	Data authentication	4
F	Backup and restore of system data	3	O	Export/copy authentication	4
G	Repetitive failure notification	3	P	Data labelling	4
H	Image handling device PSU monitoring	3	Q	Data (manipulation) protection	3
I	Image buffer holding time	3			
* See note below					

According to the requirements of BS EN 62676-1-1 the system is considered to have an overall security grade of "3".

The grade of the tamper detection (and protection) measures is not listed as the grading varies across the system according to the risk in the locality of the equipment. The tamper detection and protection provided is documented elsewhere.

Note: *Your attention is drawn to the separately documented information regarding the storage function.*

Note: *For the purposes of clarity this may be recorded as "overall system grade 3 (with variances as recorded)".*

8. Summary of the graded functions

Key:

Graded Function	Relevant Clauses and Tables of BS EN 62676-1-1	Comments	CR	G1	G2	G3	G4
Name of the function	Where to find the graded requirements.	Commentary	CR = Clause has additional requirements that are not grade dependent. G1 = Grade 1, etc. Y = Applies S = Requirements are the same for each grade with the letter S D = Requirements are different for this grade = Not applicable				

Graded Function	Relevant Clauses and Tables of BS EN 62676-1-1	CR	G1	G2	G3	G4
Common interconnections	Clause 6.1.2.2	Y			S	S
Storage	Clause 6.1.3.3 and Table 1	Y		D	D	D
Archiving and backup	Clause 6.1.3.4 and Table 2 See also T1.1 and T1.2	Y			D	D
Alarm related information	Clause 6.2.2.3	Y			S	S
System logs	Clause 6.2.2.4 and Table 3	Y		D	D	D
Backup and restore of system data	Clause 6.3.2.1				S	S
Repetitive failure notification	Clause 6.3.2.2.1	Y			S	S
Image handling device PSU monitoring	Clause 6.3.2.2.2	Y				Y
Image buffer holding time	Clause 6.3.2.2.2	Y			S	S
Essential function device failure notification time	Clause 6.3.2.2.3				S	S
Monitoring of interconnections	Clause 6.3.2.2.4 and Table 4				D	D
Tamper detection	Clause 6.3.2.3.1 and Table 5, also Clause 6.3.2.3.2			D	D	D
Authorisation code requirements	Clause 6.3.2.4 and Table 7	Y	D	D	D	D
Time synchronisation	Clause 6.3.2.5				S	S
Data authentication	Clause 6.3.3.2				S	S
Export/copy authentication	Clause 6.3.3.2				S	S
Data labelling	Clause 6.3.3.1 and Table 11	Y	D	S	S	D
Data (manipulation) protection	Clause 6.3.3.3					Y

9. Commentary on the requirements by function

9.1. Introduction

This section provides advice about the graded requirements and is grouped according to the list of functions given in the standards. For simplicity a single grade may be applied to the whole system or each of these functions may have a different grade. Note that, with the exception of tamper protection and detection, the same grade should be applied to all requirements within each function and throughout the system.

Each set of function requirements are preceded by a small table summarising the content and the relevant grades. This table also shows if there are requirements that apply at all grades.

Explanation of the columns

Introduction	CR	G1	G2	G3	G4
Where to find the graded requirements. Commentary about the function in general.	CR = Common requirements - clause has additional requirements that are not grade dependent. G1 = Grade 1, etc. Y = Applies S = Requirements are the same for each grade with the letter S D = Requirements are different for this grade = Not applicable				

Note: *Op = Optional M = Mandatory*

9.2. Common Interconnections

Introduction	CR	G1	G2	G3	G4
See Clause 6.1.2.2 Interconnections are the medium (e.g. cable, optic fibre, RF) by which data is communicated between parts of the system. A common interconnection is when one interconnection is used to send image streams to or from multiple components. E.g. a cable carries IP signals from several cameras to a recorder.	Y			S	S

Note: ***on BS EN 62676-1-1, clause 6.1.2.2, Common interconnections***
If a VSS is designed and configured in a way that single or multiple operators request video images via common interconnections, the design of the system shall ensure that the available capacity is sufficient for the anticipated operation of the VSS. This may be achieved by configuring the maximum throughput of image streams on the VSS.

There are many different ways to control (throttle) bandwidth. The location of this throttling could vary from system to system. This is a system requirement and is the responsibility of the installer.

There is an expectation (for grades 3 and 4) that the system designer provides evidence that they have considered these requirements and show how the design is intended to achieve this.

9.3. Storage

Introduction	CR	G1	G2	G3	G4
See Clause 6.1.3.3 and Table 1	Y		D	D	D

Requirements relating to storage only apply if storage is necessary and only for those cameras where storage is defined as a requirement.

Table 1	Storage	G1	G2	G3	G4
T1.1	*Data backup and/or redundant recording.*	*Op*	*Op*	*M*	*M*
T1.2	*Operating a fail-safe storage (e.g. RAID 5, continuous mirror) or switching automatically over from one storage media to another in case of storage failure.*	*Op*	*Op*	*Op*	*M*
The grade 3 and 4 requirement is that in the event of a failure images can be recovered. The intention of the grade 4 requirement is that there is unbroken storage for the specified length of time (e.g. 30 days). No single point of failure within the recording and storage system should prevent the ability to continue recording or access previous recordings. The use of continuous mirroring achieves both requirements. The requirements include four different variants which give different results in the event of a fault. Care should be taken in the choice of how these requirements are met to ensure that the method also meets customer expectations.					
T1.3	*Reacting to a trigger with a maximum latency time of:*		*1 s*	*500ms*	*250ms*
This requirement would only apply for detector activated systems. Network considerations could prevent this requirement from being achieved although, if the timing is measured from the input to the DVR, it is typically possible. If the system is pre-recording and an image is captured this should be considered satisfactory.					
T1.4	*Replaying an image from storage with a maximum time after the incident or actual recording of:*			*2s*	*1s*
Network considerations could prevent this requirement from being achievable. This might imply the need for separate buffering of the video stream simply to allow this functionality. This could be a requirement that depends on usage (e.g. live monitoring v recording).					

9.4. Archiving and backup

Introduction	CR	G1	G2	G3	G4
See Clause 6.1.3.4 and Table 2 See also T1.1 and T1.2 “backup” here refers to image copies.	Y			D	D

Table 2	Archiving & backup	G1	G2	G3	G4
T2.1	*Authentication of every single image and image sequence.*	*Op*	*Op*	*Op*	*M*
See also 6.3.3.2					
T2.2	*An automatically scheduled backup of alarm image data.*	*Op*	*Op*	*Op*	*M*
This relates only to events triggered by alarms. This requirement is fulfilled if metadata is stored and backed-up that flags the presence of alarm image data. It is not necessary to duplicate the image backup to achieve compliance with T1.1 or T1.2					
T2.3	*A backup of alarm image data by manual request.*	*Op*	*Op*	*M*	*M*
This refers to “backup” of images related to alarms (not all images). “Backup” does not mean “export”					

because that is dealt with separately.					
T2.4	*Verify the successful image backup.*	*Op*	*Op*	*M*	*M*
This might be reported to an operator with a “failure to backup” message.					

9.5. Alarm related information

Introduction	CR	G1	G2	G3	G4
See Clause 6.2.2.3	Y			S	S

Table 5	Alarm related information	G1	G2	G3	G4
6.2.2.3	*The VSS system shall be able to display alarm related information. The information presented for each alarm message shall include:* *a) the origin or source of alarm;* *b) the type of alarm;* *c) the time and date of alarm.*	*Op*	*Op*	*M*	*M*

9.6. System logs

Introduction	CR	G1	G2	G3	G4
See Clause 6.2.2.4 and Table 3 There are no specific requirements about which events should be logged at grade 1 but if any events are logged, they need to comply with 6.2.2.4. It is only necessary to log events that can occur on the system (as per the OR or SDP). For example at grade 3 it is mandatory to log “essential function failure and recovery from failure”. However the related function may be implemented at grade 2 not grade 3 and therefore the event itself is optional.	Y		D	D	D

Table 3	System logs	G1	G2	G3	G4
T3.1	*Alarms*	*Op*	*M*	*M*	*M*
T3.2	*Tampers*	*Op*	*Op*	*M*	*M*
This is a tamper from any part of the system. Only components with tamper monitoring need the associated logging.					
T3.3	*Video loss and recovery from video loss.*	*Op*	*Op*	*M*	*M*
T3.4	*Power loss.*	*Op*	*M*	*M*	*M*
Log of event may be delayed until restore of power. Loss of power to peripheral components might not be logged except by inference (e.g. video loss).					
T3.5	*Essential function failure and recovery from failure.*	*Op*	*Op*	*M*	*M*
"Essential functions" are defined as the vital functions of a VSS, which are image capturing, transmission, recording and/or presentation. Logging should be provided for all fault conditions that are recognisable at the DVR as defined in the OR and/or SDP.					
T3.6	*Fault messages displayed to the user.*	*Op*	*Op*	*Op*	*M*
This is a requirement that the contents of fault messages displayed to the user are logged.					
T3.7	*System reset, start, stop.*	*Op*	*M*	*M*	*M*
T3.8	*Diagnostic actions (health check.*	*Op*	*Op*	*Op*	*M*
T3.9	*Export, print/ hardcopy incl. the image source identifier, time range.*	*Op*	*M*	*M*	*M*
T3.10	*User log in and log out at workstation with time stamp, successful and denied logins (local/remote) including reason of denial (wrong password, unknown user, exceeded account.)*	*Op*	*M*	*M*	*M*
T3.11	*Changes in authorisation codes.*	*Op*	*Op*	*M*	*M*
It is recommended that the log record includes the user making the change and the affected user. It should not log the authorisation code.					
T3.12	*Control of functional cameras.*	*Op*	*Op*	*Op*	*M*
The log record should show which user had control of the functional camera (but not necessarily what changes they made) In some cases (e.g. public space monitoring) this might be beneficial at lower grades.					
T3.13	*Search for images and replay of images.*	*Op*	*Op*	*M*	*M*
The log record should show which user searched for images. It is recommended that the search details are logged (i.e. which cameras, what time period).					
T3.14	*Manual changes of recording parameters.*	*Op*	*Op*	*M*	*M*
The log record should show which user changed recording parameters. It is recommended that the details of the parameters changed are logged including, if possible, the parameter settings.					
T3.15	*Alarm acknowledge / restore.*	*Op*	*Op*	*M*	*M*

The log record should show which user acknowledged or restored alarms together with the alarm.					
T3.16	*System configuration change.*	*Op*	*Op*	*M*	*M*
The log record should show which user changed the system configuration. It is recommended that the details of the configuration changed are logged including, if possible, the settings.					
T3.17	*Date and time set and change with current time and new time.*	*Op*	*Op*	*M*	*M*
The log record should show which user changed the time (or if it was carried out automatically) together with the relevant times.					

9.7. Backup and restore of system

Introduction	CR	G1	G2	G3	G4
See clause 6.3.2.1 System data are the configurable parameters for the system. "Backup" here refers to copies of the configuration.				S	S

	Backup and Restore of system	G1	G2	G3	G4
6.3.2.1	*Capable of backup and restore of all system data.*	*Op*	*Op*	*M*	*M*
This requirement covers backup and restore of all configurable settings throughout the system. As a minimum this should include DVR. Where possible other components should be included. When equipment is not capable of this a procedure should be defined to allow for restoration of configuration data.					

9.8. Repetitive failure notification

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.2.1	Y			S	S

	Repetitive failure notification	G1	G2	G3	G4
6.3.2.2.1	*The system shall be able to detect repetitive failures from a component and shall be configurable to generate a single message which shall only be repeated each time a new user logs in or the system restarts.*	*Op*	*Op*	*M*	*M*
The use of this configurable option could cause faults to be hidden. The use of the feature should be made with caution.					

9.9. Image handling device PSU monitoring

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.2.2 Although the name given to the function is "Image Handling Device PSU Monitoring" the requirement in 6.3.2.2.2 is not specific to image handling devices and applies to all power supplies.	Y				Y

	Image handling device PSU monitoring	G1	G2	G3	G4
6.3.2.2.2	*Failure of the primary and, if available alternative, power supplies to the system shall be monitored, with notification according to clause 6.3.2.2.1.*	*Op*	*Op*	*Op*	*M*
6.3.2.2.2	*In any case power supply failure shall always be indicated locally.*	*Op*	*Op*	*Op*	*M*
6.3.2.2.2	*The VSS shall attempt to resume normal operation after recovering from power loss. If the system is unable to resume after power has been restored, with the settings which existed before the power failure, this shall be logged and also indicated to an operator.*	*Op*	*Op*	*Op*	*M*

Video loss is not considered to be equivalent to PSU failure.

Notification requirements in 6.3.2.2.1 include presentation of:

- *Time and date;*
- *Origin and type of failure.*

As "origin" is not defined the information related to PSU failure does not need to include identification of the individual PSU although this may be included.

9.10. Image Buffer Holding Time

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.2.2	Y			S	S

	Image handling device PSU monitoring	G1	G2	G3	G4
6.3.2.2.2	*Images shall not be held in a buffer for longer than 5 seconds without being written into the storage medium.*	*Op*	*Op*	*M*	*M*

This performance requirement is not one that would have been traditionally met. Installers should check that the equipment is correctly configured to achieve this.

If the buffer time is greater than 5 seconds but there is redundancy in the VSS such that the images are stored elsewhere (e.g. in the camera) then this should satisfy this requirement.

9.11. Essential function device failure notification time

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.2.3				S	S

	Essential function device failure notification time	G1	G2	G3	G4
6.3.2.2.3	*The VSS shall manage device failure by indicating any failure of the essential functions within 100 s of the failure.*	*Op*	*Op*	*M*	*M*

"Essential functions" are defined as the vital functions of a VSS, which are image capturing, transmission, recording and/or presentation.

9.12. Monitoring of interconnections

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.2.4 and Table 4. Interconnections are not limited to those carrying video but also includes control signals and others.				D	D

Table 4	Monitoring of interconnections	G1	G2	G3	G4
T4.1	*Repeatedly verify the interconnection at regular intervals with a maximum of:*			*30s*	*10s*
T4.2	*Try to re-establish an interconnection with following number of retries before notification:*			*5*	*2*
T4.3	*Maximum time permitted before notification to an operator of an interconnection failure:*			*180s*	*30s*
62676-1-2 T7.1	*Maximum permitted duration of device unavailability:*			*180s*	*30s*
The last two of these requirements refer to the same period of time. Therefore the unavailability of an interconnection must be identified and notified to the operator within the time specified. *It may be difficult to achieve some of these requirements with analogue systems.* *Requirement T4.3 The time stated can make allowance for the number of retries. (i.e. once a fault is detected the retries can be performed before notification is necessary).*					

9.13. Tamper detection

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.3.1 and Table 5. Also Clause 6.3.2.3.2 Although only “detection” is listed as a graded function tamper “protection” also has graded requirements. Tamper protection and detection arrangements can vary from location to location and grading need not be applied consistently throughout the system. Tamper requirements may be unnecessary if the camera is inaccessible. The tamper protection and detection provided to parts of the system should be documented in the system design proposal and/or OR. ***Note:*** *Athough when performing a risk assessment it may seem unlikely that an attack may be carried out against parts of the system to overcome the security it remains a possibility that vandals may simply attack the VSS.*			D	D	D

Table 5	Tamper detection	G1	G2	G3	G4
T5.1	*Video loss.*	*Op*	*M*	*M*	*M*
62676-1-2 T7.2	*Maximum detection time for live signal loss:*		*8s*	*4s*	*2s*
T5.2	*If an image capturing device with a fixed field of view no longer includes the entire specified field of view.*	*Op*	*Op*	*M*	*M*
This implies use of video analytics. Care should be taken that the use of video analytics does not result in a large number of false tamper detections. Consideration should be given to the reaction time (e.g. to permit normal activities that may affect the image).					
T5.3	*Deliberately obscuring or blinding of the imaging device range.*	*Op*	*Op*	*M*	*M*
Similar to T5.2					
T5.4	*The substitution of any video data at image source, interconnection or handling.*	*Op*	*Op*	*Op*	*M*
It is unlikely that this can be achieved using analogue cameras.					
T5.5	*Significant reduction of the contrast of the image.*	*Op*	*Op*	*Op*	*M*

	Tamper detection	G1	G2	G3	G4
6.3.2.3.2	*Image capturing devices shall be protected against tamper.*	*Op*	*Op*	*M*	*M*
Installers should refer to manufacturer's documentation to ensure suitability.					

9.14. Authorisation code requirements

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.4 and Table 7	Y	D	D	D	D

Table 7	Authorisation code requirements	G1	G2	G3	G4
T7.1	*Minimum Number of possible logical authorisation keys:*		*10,000*	*100,000*	*1,000,000*
T7.2	*Minimum Number of possible physical authorisation keys:*		*3,000*	*15,000*	*50,000*
At all grades access to functions required to be accessible at level 2, 3 and 4 shall be restricted by means of key, password, code or similar access-limiting means or device. At grade 1 this requirement still applies but the number of possible "keys" is not specified.					

9.15. Time synchronisation

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.2.5 and Table 7				S	S

	Time synchronisation	G1	G2	G3	G4
6.3.2.5	*Time settings of various components of a VSS system shall always be within +/- 10 seconds of UTC.*	*Op*	*Op*	*M*	*M*
Time should be accurate to UTC but can reflect local time (see 62676-1-1 clause 6.1.3.8).					

9.16. Data labelling

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.3.1 and Table 11	Y	D	S	S	D

Table 11	Data labelling	G1	G2	G3	G4
T11.1	*Location (e.g. name of site).*	*Op*	*M*	*M*	*M*
T11.2	*Source (e.g. capturing device labelled by camera number).*	*Op*	*M*	*M*	*M*
T11.3	*Date and time.*	*M*	*M*	*M*	*M*
This refers to capture time rather than storage time.					
T11.4	*Date and time in UTC including offset for local time.*	*Op*	*Op*	*Op*	*M*
At all grades access to functions required to be accessible at level 2, 3 and 4 shall be restricted by means of key, password, code or similar access-limiting means or device. At grade 1 this requirement still applies but the number of possible "keys" is not specified.					

9.17. Data authentication

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.3.2				S	S

	Data authentication	G1	G2	G3	G4
6.3.3.2	*Provide a method (e.g. watermarking, checksums, fingerprinting) to authenticate image and meta data and their identity. The authentication method shall be applied at the time the data is recorded and shall notify the user if any of the following has occurred:* • *Any of the images have been changed or altered;* • *One or more images have been removed from a sequence;*	*Op*	*Op*	*M*	*M*

	• *One or more images have been added to a sequence;* • *The data label has been changed or altered.*				
Table 2.1 has a requirement which may at first sight appear similar but is applicable only to backup and archive.					

9.18. Export / copy authentication

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.3.2				S	S

	Export / copy authentication	G1	G2	G3	G4
6.3.3.2	*Provide a method by which the authenticity of copied and exported data is verified.*	*Op*	*Op*	*M*	*M*

9.19. Data (manipulation) protection

Introduction	CR	G1	G2	G3	G4
See Clause 6.3.3.3					Y

	Data (manipulation) protection	G1	G2	G3	G4
6.3.3.3	*Provide a method (e.g. encryption) to prevent unauthorized persons viewing the images and other data without permission.*	*Op*	*Op*	*Op*	*M*
6.3.3.3	*Provide a method to protect the confidentiality of copied and exported data.*	*Op*	*Op*	*Op*	*M*
62676-1-2 Clause 12.1	*All data communication outside secured technical room areas shall be encrypted in the security grade 4. AES with 128 bit key for symmetric and RSA with 1 024 bit key shall be provided. Native encryption shall not be accepted. The VTDs shall not store any form of passwords in clear text. All such passwords either in configuration files or a database shall be encrypted.* *A VTD according to this standard shall support transport level security for the security grade 4.*	*Op*	*Op*		*M*
62676-1-2 Clause 12.2	*A VTD compliant to this standard shall support in security grade 4 TLS 1.0 according to the IETF standard RFC 2246 and TLS 1.1 according to RFC 4346. Optionally the VTD may support TLS 1.2 according to RFC 5246.*	*Op*	*Op*		*M*
62676-1-2 Clause 8.3.4	*Digest Access Authentication is recommended in security grade 3 and 4 systems, because of the higher security provided.*	*Op*	*Op*	*R**	*R**
Note: *this is a recommendation and is therefore not mandatory.*					

10. Graded requirements – summary

The following table can be used as a checklist.

Key:

Op	=	Optional
M	=	Mandatory
R	=	Recommended

Clause number (e.g. 6.1.2.2) means a clause in 62676-1-1, if a standard number is also given then it is the clause in that standard.

Tm.n (e.g. T1.4) means the n^{th} row in table m (e.g. 4^{th} row of table 1).

The dividing lines marked "FUNCTION" separate the 18 functions that may be graded separately.

		Security grade			
Table & row or clause	**Subject**	**1**	**2**	**3**	**4**
FUNCTION: Common interconnections					
6.1.2.2	Common Interconnections If a VSS is designed and configured in a way that single or multiple operators request video images via common interconnections, the design of the system shall ensure that the available capacity is sufficient for the anticipated operation of the VSS. This may be achieved by configuring the maximum throughput of image streams on the VSS.	Op	Op	M	M
FUNCTION: Storage (Table 1)					
T1.1	Data backup and/or redundant recording.	Op	Op	M	M
T1.2	Operating a fail-safe storage (e.g. RAID 5, continuous mirror) or switching automatically over from one storage media to another in case of storage failure.	Op	Op	Op	M
T1.3	Reacting to a trigger with a maximum latency time of:		1 s	500ms	250ms
T1.4	Replaying an image from storage with a maximum time after the incident or actual recording of:			2s	1s
FUNCTION: Archiving and backup (Table 2)					
T2.1	Authentication of every single image and image sequence.	Op	Op	Op	M
T2.2	An automatically scheduled backup of alarm image data.	Op	Op	Op	M
T2.3	A backup of alarm image data by manual request.	Op	Op	M	M
T2.4	Verify the successful image backup.	Op	Op	M	M
FUNCTION: Alarm related information					
6.2.2.3	The VSS system shall be able to display alarm related information. The information presented for each alarm message shall include: a) the origin or source of alarm; b) the type of alarm;	Op	Op	M	M

Table & row or clause	Subject	Security grade 1	2	3	4
	c) the time and date of alarm.				
FUNCTION: System logs (Table 3)					
T3.1	Alarms	Op	M	M	M
T3.2	Tampers	Op	Op	M	M
T3.3	Video loss and recovery from video loss.	Op	Op	M	M
T3.4	Power loss.	Op	M	M	M
T3.5	Essential function failure and recovery from failure.	Op	Op	M	M
T3.6	Fault messages displayed to the user.	Op	Op	Op	M
T3.7	System reset, start, stop.	Op	M	M	M
T3.8	Diagnostic actions (health check).	Op	Op	Op	M
T3.9	Export, print/ hardcopy incl. the image source identifier, time range.	Op	M	M	M
T3.10	User log in and log out at workstation with time stamp, successful and denied logins (local/remote) including reason of denial (wrong password, unknown user, exceeded account.	Op	M	M	M
T3.11	Changes in authorisation codes.	Op	Op	M	M
T3.12	Control of functional cameras.	Op	Op	Op	M
T3.13	Search for images and replay of images.	Op	Op	M	M
T3.14	Manual changes of recording parameters.	Op	Op	M	M
T3.15	Alarm acknowledge / restore.	Op	Op	M	M
T3.16	System configuration change.	Op	Op	M	M
T3.17	Date and time set and change with current time and new time.	Op	Op	M	M
FUNCTION: Backup and restore of system					
6.3.2.1	Capable of backup and restore of all system data.	Op	M	M	M
FUNCTION: Repetitive failure notification					
6.3.2.2.1	The system shall be able to detect repetitive failures from a component and shall be configurable to generate a single message which shall only be repeated each time a new user logs in or the system restarts.	Op	Op	M	M
FUNCTION: Image handling device PSU monitoring					
6.3.2.2.2	Failure of the primary and, if available alternative, power supplies to the system shall be monitored, with notification according to clause 6.3.2.2.1.	Op	Op	Op	M
6.3.2.2.2	In any case power supply failure shall always be indicated locally.	Op	Op	Op	M
6.3.2.2.2	The VSS shall attempt to resume normal operation after recovering from power loss. If the system is unable to resume after power has been restored, with the settings which existed before the power failure, this shall be logged and also indicated to an operator.	Op	Op	Op	M
FUNCTION: Image buffer holding time					
6.3.2.2.2	Images shall not be held in a buffer for longer than 5 seconds without being written into the storage medium.	Op	Op	M	M
FUNCTION: Essential function device failure notification time					

Table & row or clause	Subject	Security grade			
		1	2	3	4
6.3.2.2.3	The VSS shall manage device failure by indicating any failure of the essential functions within 100 s of the failure.	Op	Op	M	M
FUNCTION: Monitoring of interconnections (Table 4)					
T4.1	Repeatedly verify the interconnection at regular intervals with a maximum of:			30s	10s
T4.2	Try to re-establish an interconnection with following number of retries before notification:			5	2
T4.3	Maximum time permitted before notification to an operator of an interconnection failure:			180s	30s
62676-1-2 T7.1	Maximum permitted duration of device unavailability:			180s	30s
FUNCTION: Tamper detection (Table 5)					
T5.1	Video loss.	Op	M	M	M
62676-1-2 T7.2	Maximum detection time for live signal loss.		8s	4s	2s
T5.2	If an image capturing device with a fixed field of view no longer includes the entire specified field of view.	Op	Op	M	M
T5.3	Deliberately obscuring or blinding of the imaging device range.	Op	Op	M	M
T5.4	The substitution of any video data at image source, interconnection or handling.	Op	Op	Op	M
T5.5	Significant reduction of the contrast of the image.	Op	Op	Op	M
6.3.2.3.2	Image capturing devices shall be protected against tamper.	Op	Op	M	M
FUNCTION: Authorisation code requirements (Table 7)					
T7.1	Minimum number of possible logical authorisation keys:		10,000	100,000	1,000,000
T7.2	Minimum number of possible physical authorisation keys:		3,000	15,000	50,000
FUNCTION: Time synchronisation					
6.3.2.5	Time settings of various components of a VSS system shall always be within +/- 10 seconds of UTC.	Op	Op	M	M
FUNCTION: Data labelling (Table 11)					
T11.1	Location (e.g. name of site).	Op	M	M	M
T11.2	Source (e.g. capturing device labelled by camera number).	Op	M	M	M
T11.3	Date and time.	M	M	M	M
T11.4	Date and time in UTC including offset for local time.	Op	Op	Op	M
FUNCTION: Data authentication					
6.3.3.2	Provide a method (e.g. watermarking, checksums, fingerprinting) to authenticate image and meta data and their identity. The authentication method shall be applied at the time the data is recorded and shall notify the user if any of the following has occurred: • any of the images has been changed or	Op	Op	M	M

Table & row or clause	Subject	Security grade 1	2	3	4
	altered; • one or more images have been removed from a sequence; • one or more images have been added to a sequence; • the data label has been changed or altered.				
FUNCTION: Export / copy authentication					
6.3.3.2	Provide a method by which the authenticity of copied and exported data is verified.	Op	Op	M	M
FUNCTION: Data (manipulation) protection					
6.3.3.3	Provide a method (e.g. encryption) to prevent unauthorized persons viewing the images and other data without permission.	Op	Op	Op	M
6.3.3.3	Provide a method to protect the confidentiality of copied and exported data.	Op	Op	Op	M
62676-1-2 Clause 12.1	The video transmission device shall have in the higher security grade 4 the ability to provide authentication, integrity checking and encryption on all network interfaces.	Op	Op	Op	M
62676-1-2 Clause 12.1	All data communication outside secured technical room areas shall be encrypted in the security grade 4. AES with 128 bit key for symmetric and RSA with 1 024 bit key shall be provided. Native encryption shall not be accepted. The VTDs shall not store any form of passwords in clear text. All such passwords either in configuration files or a database shall be encrypted. A VTD according to this standard shall support transport level security for the security grade 4.	Op	Op	Op	M
62676-1-2 Clause 12.2	A VTD compliant to this standard shall support in security grade 4 TLS 1.0 according to the IETF standard RFC 2246 and TLS 1.1 according to RFC 4346. Optionally the VTD may support TLS 1.2 according to RFC 5246.	Op	Op	Op	M
62676-1-2 Clause 8.3.4	Digest Access Authentication is recommended in security grade 3 and 4 systems, because of the higher security provided.	Op	Op	R	R

11. Guidance for manufacturers

11.1. Introduction

As mentioned in the introduction to this document, the grading of VSS is not the same as the grading of intruder & hold-up alarm systems in which there are a number of component standards. Using a component standard means that a manufacturer can test a product and ensure that it meets a particular specification and therefore grade. The manufacturer can then promote the product as being suitable for an installation that requires that grade.

From the point of view of a specifier, system integrator or installer the advantage of being able to buy a product with a known grade is obvious as it saves a lot of effort assessing the product capability. Whilst the grading is

carried out by the designer or installer, there is a requirement for the component to be capable of meeting the functionality specified within the standard. Though there is no obligation on the manufacturer to declare a "grade" of component, it may be beneficial for manufacturers to indicate grade compatibility (this may vary as a result of configuration changes or options) as it may aid use of their product in the marketplace.

In summary, we can say that indicating the suitability of a product for use to meet a certain grade requirement is recommended but that the task of determining the grade of a product is not easy.

11.2. System v component

The major difficulty for assessing the grade of a product is that the BS EN 62676 standards are primarily based on the system. This means that to meet the graded requirement it is necessary to check that the components of the system achieve the requirements when used in combination. If all of the components in a system are made by a single manufacturer then this may be easier to assess, but in other cases this may be less straightforward. Caution may be required if single products within a system are upgraded (e.g. by a software update) because this could cause a function to work differently or not work at all or cause compatibility issues with other products.

Even where a manufacturer determines that their product can be installed, for example, to achieve the grade 3 requirements, this does not mean that it will meet these requirements when installed. For example, a product may have a facility to ensure monitoring of interconnections (see 9.2), but if it is connected to another product without this feature the system, as a whole, will not meet the requirement for grade 3.

There is also the possibility that a manufacturer may make a product which can be configured to meet the graded requirements or not. In this instance the product documentation can make clear which configuration would be necessary.

The best a manufacturer can do is state the highest grade that a component could meet. There are some requirements that a product may not be able to meet at a higher grade and this will clearly limit that product no matter what the remainder of the system can do.

11.3. Graded functions

Some graded features may not be relevant for certain products and this should be highlighted.

It is important to note that it is not just the overall grade of a component that is important. A VSS may not require all the features of a product or, as explained in section 6, the part of the system may be graded differently. This means that even if a product does not meet every aspect of the graded requirements, it may still be suitable.

A customer might need to break all the functional requirements down to the smallest element in order to assess suitability, but this would mean providing a large amount of complicated information. The optimum approach could be to use a method similar to that shown in section 7. Manufacturers can use the information in Section 9 to assist with determining compliance.

The following is an example of how the manufacturer might present the information.

This product is suitable for use in a BS EN 62676-1 installation to a maximum overall grade of 2 where a VSS installation does not require all functions to meet the graded requirement, the following table may help to assess the suitability. Note that the equipment must be configured and installed as specified elsewhere in this documentation to ensure compliance.

	Description	Grade		Description	Grade
A	Common interconnections	2	J	Essential function device failure notification time	4
B	Storage	2	K	Monitoring of interconnections	4
C	Archiving and backup	2	L	Authorisation code requirements	N/A
D	Alarm related information	2	M	Time synchronisation	2
E	System logs	N/A	N	Data authentication	2
F	Backup and restore of system data	2	O	Export/copy authentication	N/A
G	Repetitive failure notification	2	P	Data labelling	2
H	Image handling device PSU monitoring	2	Q	Data (manipulation) protection	2
I	Image buffer holding time	3			

11.4. Tamper protection

As noted in 6.3.3, tamper protection and detection is treated differently and can be dealt with on an individual component location basis. It can also be that this protection can be provided by ancillary equipment. For example, a camera could be housed in a separately purchased protective housing.

11.5. Summary

Expecting an installer or integrator to analyse the specification of every product used to form a system is somewhat impractical but it is also difficult for a manufacturer to guarantee the suitability of a product with regard to graded requirements given the diverse possibilities for an installation.

Assessment by the manufacturer of the potential grading of their products (or at a minimum a statement about the best possible grade that could be achieved) and the presentation of this in a standard format, such as that shown above, will assist all parties in meeting the OR of the VSS.

This document was created by the VSS Section of the British Security Industry Association (BSIA).

The British Security Industry Association is the trade association for the private security industry in the UK. Our members provide over 70% of UK security products and services and adhere to strict quality standards.

VSS has had a profound impact on crime prevention and detection. The UK leads the way in the application of VSS and its use is wide-ranging, encompassing facial-recognition technology, remote video monitoring, video smoke detection, mobile systems and Automatic Number Plate Recognition as well as many other functions. In order to provide guidance and simplification in the complex area of VSS, the BSIA is very active in the European & International standards arena's and also develops its own guides and codes of practice where currently standards do not exist.

The VSS Section encourages debate on new developments and concerns, such as digital video evidence and facilitating communication protocols between different manufacturers' products. In doing so it seeks to ensure that all stakeholder interests are represented including: security companies, users, the Police, inspectorates and insurers. The section also works with Government on these issues.

VSS must be operated responsibly in order to respect citizens' rights and maintain public confidence. Laws such as the Data Protection Act have an important role to play in achieving this. BSIA VSS companies drive best practice in this area and can provide advice on how VSS users can adhere to the relevant legislation.

BSIA membership will raise your company profile and ensure that your business is at the heart of influencing the future of the security industry. You will become part of a unique group of high quality and professional companies which are well-respected and well-represented to government, end users, specifiers, standards and legislative bodies. For more information contact the BSIA.