

SOUTH AFRICAN INTRUDER DETECTION SERVICES ASSOCIATION

BY-LAW NO. 9

Requirements for the installation of a Video Surveillance System

Revised 2017 Version 1.2

PREAMBLE

The purpose of this By-Law is to determine a minimum technical requirement for Video surveillance systems that will ensure the appropriate/sufficient quality of images under different physical and environmental circumstances around residential and commercial sites for monitoring, detection, recognition and identification with the purpose of deterrence of potential perpetrators and the generation of video footage that will support investigations and successful prosecutions.

The compilation of this By-Law involved consultation between members of SAIDSA; experts in the field of Video Surveillance, including amongst other accredited installers, retailers and manufacturers of Video Surveillance equipment and other relevant sectors where required. Many local and world standards were referenced and included to assist in the compilation and application of this By-Law.

These minimum requirements can be categorised as follows, and are dealt with separately under each heading:

1. Operational Requirement Analysis (OR)
2. Functional requirements
3. Categories and system management
4. Installation guidelines
5. Recording and Monitoring permissions (Privacy)

Definitions

Video Surveillance System: System consisting of camera equipment, storage, monitoring and associated equipment for transmission and controlling purposes.

Surveillance: Observation or inspection of persons, premises or scenes for safety and security purposes.

Operation Requirement (OR): A statement of needs based on a thorough and systematic assessment of the problems to be solved based on the user requirements and expected results.

Camera: A device containing an imaging component to produce a video signal from a scene.

BNC: A connector used between coaxial cable and an input/output port, either male or female.

Field of View: The measure of the visible area within the camera's field of view.

RJ 45: A connection termination used in conjunction with Cat5 and Cat6 cables.

Coaxial Cable: A cable used to transmit analog signal from a camera to a monitor or DVR. It is named coaxial because of its components: a copper core and a woven copper shield.

Compression: The feature on a DVR, or an IP camera, to compress an image, or make it smaller.

Depth of Field: The area between the closest and further objects where everything in that area appears sharp and in focus.

Digital Video Recorder (DVR): A device that processes and compresses the images coming in from an analog camera and stores them on a Hard Disk Drive.

Network Video Recorder (NVR): a software program that records video in a digital format to a disk drive, USB flash drive, SD memory card or other mass storage device and is typically deployed in an IP video surveillance system.

Internet Protocol (IP) Camera: A camera that sends and receives data over the internet. It compresses videos itself, and can store footage directly onto HDDs.

LUX: The measurement of minimum lighting required for a camera to record. The smaller the lux, the darker the setting the camera can record in.

Pan, Tilt, Zoom (PTZ) : A camera that has the ability to pan (move side-to-side), tilt (tilt up and down), and zoom (in and out) onto certain objects.

Power over Ethernet (PoE): a device used to extend an Ethernet or network segment beyond its distance limitation which is approximately 100 metres..

Operational Requirement Analysis (OR)

The Operational Requirement analysis is a critical requirement when designing, testing and confirming the operational effectiveness of the CCTV system. The OR document clearly states:

1.1. **What problems need to be solved** – the user needs to assist in selection of functional and observation purposes for each camera. These categories are to suggest appropriate image size to aim towards for that specific scene, so as to fulfill the specific observation requirement. The speed of target movement in the observation frame must be considered, as this affects frame rate of the events being observed. Lighting and camera performance is important for low light and high contrast scene. If the imagery is to be recorded, playback observation may be affected by compression technologies. These observation categories can be divided into:

These observation categories are defined as follows:

- 1.1.2 **Monitoring and Control** – to oversee a large area or wide field of view;
- 1.1.3 **Detection** – to be alerted to the presence of activity in the field of view;
- 1.1.4 **Observation** – to be able to observe characteristics within moderately sized field of view;
- 1.1.5 **Recognition** – to be able to identify a known person or object within the field of view;
- 1.1.6 **Identification** – to be able to clearly identify an unfamiliar individual or object within the field of view.

1.1.7 Operational Functions – will suggest:

- 1.1.7.1 who will monitor the system;
- 1.1.7.2 when and where the system will be monitored from;
- 1.1.7.3 how the events observed or generated will be handled.

The selections taken here will impact heavily on many of the system and management requirements of the Video Surveillance system. A robust operating procedure is imperative for establishing integrity of evidence and dealing with legal challenges in court.

1.2 System requirements

System features should be sufficient to match the minimum Operational Requirement, i.e.

- 1.2.1 What alert function must the system produce on event detected/triggered, i.e. audible, display, record, log, etc
- 1.2.2 Display of images, i.e. screen sizes, number of images per display, remote viewing, etc
- 1.2.3 Recording, i.e. storage media, retention periods, image quality, frame rates, compression technologies, metadata embedded into image, etc
- 1.2.4 Archiving & Exporting of data for permanent record, i.e. export/archive procedure, media & software needed to view images.

1.3 Management issues.

- 1.3.1 Constraints, i.e. licensing, regulations, public consultations, etc;
- 1.3.2 Legal issues, i.e. laws pertaining to Data Protection, Privacy, handling of data for evidentiary proceedings, etc;
- 1.3.3 Maintenance, i.e. of system equipment, warranties, upgrades, etc;
- 1.3.4 Resources, i.e. personnel to run system, service contracts, consumables, training costs, etc.
- 1.3.5 All devices, as required, shall comply with local electrical safety and Energy Efficiency regulations as stated by SABS.

2 Functional requirements

2.1 Image Capture

Video images must be sharp, clear and stable and of a quality suitable for Monitoring, Detection, Recognition or Identification as specified in the Operational requirement. This may include but is not limited to resolution, colour, size of displayed image and frame rate.

2.2 Image Handling

2.2.1 Presentation

The displayed image shall be the same as in the original image source, or scaled when extreme resolutions are used. Any object masks, timestamps, camera names or camera numbers produced by the system shall not obscure the required image. This does not include privacy masks.

3. Categories

*The following categories define the level of security required for a CCTV installation and can be used as a **guideline** to product selection as well as the requirement in terms of the Operational Requirement.*

3.1 Category 1 -low risk

For surveillance of low risks. The system has no protection level and no restriction of access or authority levels. *(Minimum Installation standard; Standalone, monitored or off-site monitored.)*

3.2 Category 2 - low to medium risk

For surveillance of low to medium risks. The system has low protection level and low access restrictions and authority levels.

3.3 Category 3 - medium to high risk

For surveillance of medium to high risks. The system has high protection levels and high access restrictions and authority levels.

3.4 Category 4 - high risk

For surveillance of high risks. The system has very high protection level and very high restriction of access and high authority levels. (*Protection against tampering, Alarm protection, Fire safety cable, Racks and coding*)

4. Installation Guidelines

4.1 Scene and illumination

- 4.1.1 The area to be viewed must be of such a nature that lighting levels will provide suitable quality images. Where this is not the case, the client is responsible for providing the necessary lighting requirements.
- 4.1.2 The new or additional light source selected should give acceptable pictures under all likely working conditions.
- 4.1.3 Illumination over the scene being surveyed should be as even as possible avoiding any area of very low light illumination.
- 4.1.4 Where possible lights should be mounted so that they do not impair the camera picture quality. The preferred position for the light is above the camera. The camera should not view the scene through intense beams of light.
- 4.1.5 Particular attention should be paid to the direction of illumination. The aim is to produce a maximum of contrast for intruder detection. An object can only be detected if its brightness is different to that of its background.
- 4.1.6 Prior to commencing work all Safety Requirements should be considered.

4.2 Cable installation

- 4.2.1 Cable types should be correctly selected as per the manufacturers recommendations. Consideration should be given to possible voltage drops and signal loss.
- 4.2.2 Cable routes should be planned to provide the shortest practical distance between equipment locations.
- 4.2.3 All camera cables must be labelled or marked for identification purposes.
- 4.2.4 Joints in video cables are not permitted.
- 4.2.5 No sharp bends in Co-axial cables are permitted.
- 4.2.6 Video cables must not be run closer than 30cm when run in parallel to AC power cables.
- 4.2.7 Overhead cable runs should be avoided wherever possible. If this is not possible, the clearance height should allow for stretching of the support wire and fixings should comply with the current standard.
- 4.2.8 Cables that are vulnerable to corrosion or mechanical damage as well as external wiring, must be suitably protected or placed in conduit, trunking or cable trays. Cables should be suitably protected based on the environment in which they are installed.
- 4.2.9 Where fibre optic cables are used, loss figures should allow for a minimum of three cable repairs during the life of the system. Bending radius should be within the manufacturer's specification.

4.3 Hardware installation

- 4.3.1 Fixings should be in accordance with the manufacturer's specifications.
- 4.3.2 Where cameras are vulnerable to environmental damage, dust or damp, they must be suitably protected by means of outdoor housings.
- 4.3.2 Where PoE Extenders are used, they should be suitably protected in termination enclosures.

- 4.3.3 All terminations must be in suitable IP rated enclosures.
- 4.3.4 Earthing should take into consideration the possibility of lightning strikes and electrical interference.
- 4.3.5 Where BNC connectors are used, cable terminations must be permanent and must be correctly crimped and insulated. A crimping tool must be used for this purpose.
- 4.3.6 For insulation purposes, rubber boots should be used on BNC connectors.
- 4.3.7 Camera brackets must be securely mounted on a stable surface using suitable fasteners.
- 4.3.8 Where possible suitable measures must be taken to avoid tampering of cables.
- 4.3.9 Power supplies must be fused and surge protected. The maximum load must not be more than 80% of the capacity of the power supply.
- 4.3.10 All power supply equipment shall be correctly earthed according to manufacturers instructions using an electrical earth.

5. Recording and Monitoring Permissions

- 5.1 Privacy of surroundings must always be considered and respected.
- 5.2 Video recording permission must be requested or specifically noted for Public areas.
- 5.3 Audio recording permission is to be separately authorized from video recording.
- 5.4 Cameras are not permitted in bathrooms, restrooms, changerooms and bedrooms.

6. OPERATIONAL PROCEDURES

When the system is installed, the subscriber shall receive a practical demonstration of the systems full functionality. An operating instruction manual for the control panel must be available on request.

7. RECORDS

The installation Company shall maintain accurate records relating to each Video Surveillance System installed.

8. COMPANY REPRESENTATIVE IDENTIFICATION

All representatives of the installation company shall carry an identification card bearing the company name, PSIRA number, photograph and identity number.

9. CERTIFICATE OF COMPLIANCE

- 9.1 A SAIDSA certificate of compliance for CCTV must be issued to the client when the Video Surveillance System has been installed. The Installation Company must keep duplicate certificates for the duration of the contract.
- 9.2 All certificates and/or guarantees provided by the installer will be null and void if any third party, including the user, tampers, adds, removes or replaces any equipment in the installation. SAIDSA must be informed by the installer of any such occurrence.
- 9.3 Any non-compliance exceptions are to be clearly noted on the certificate.

EN 50132-1	European Standard: Alarm systems - CCTV surveillance systems for use in security application - March 2010
BSIA	Planning, design, installation and operation of CCTV Surveillance Systems - Code of Practice & associated Guidance - Feb 2014, Issue 3
SABS-0222-5-2:1999	CCTV Installation Guidelines
SANS 10222-5-1-2:2007	Electrical security installations - CCTV installations – CCTV surveillance systems for use in security applications: System design requirements
SANS 10222-5-1-1:2007	Electrical security installations - CCTV installations – CCTV surveillance systems for use in security applications: Operational requirements
SANS 10222-5-1-3:2007	Electrical security installations - CCTV installations – CCTV surveillance systems for use in security applications: Installation, planning and implementation requirements
SANS 10222-5-1-4:2003	Electrical security installations - CCTV installations – CCTV surveillance systems for use in security applications: Testing, commissioning and hand-over requirements
SANS 10222-5-1-5:2003	Electrical security installations - CCTV installations – CCTV surveillance systems for use in security applications: Maintenance requirements

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