

 Eskom	Guideline	Technology
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FOR SECONDARY PLANT
PHYSICAL SECURITY SYSTEMS**

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1. Introduction

This document entails the verification of the correct installation of the electronic physical security systems at Eskom substations and Telecoms sites. The Security systems covered in this document include CCTV System, Access Control System, Electric fence System, alarm system, Intrusion pre-detection system, Public Address (PA) System, intercom system and Physical security information management (PSIM) system. The commissioning tests shall be undertaken to ensure that the installed Security Systems meet the installation and functional requirements and to identify and correct non-conformances before the installed system can be handed over to Eskom. In addition to the tests stipulated in this document, site specific acceptance test procedures may be developed to test site specific functionality required.

Note: The terms Non-lethal energized perimeter detection system and Electric fence will be used synonymously in this document

2. Supporting clauses

2.1 Scope

This document formalizes Eskom's requirements regarding the commissioning inspections for electronic physical security systems at Eskom substation and Telecoms sites.

2.1.1 Purpose

This document formalizes Eskom's requirements for the commissioning inspections for electronic physical security systems at Eskom substations and Telecoms sites. It outlines the checks that must be conducted to identify and correct non-conformances prior to handing over of the installed systems to Eskom.

2.1.2 Applicability

This document shall apply to Eskom substations and Telecoms sites.

2.2 Normative/informative references

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001, Quality Management Systems.
- [2] 240-86738968 Specification for Integrated Security Alarm System for Protection of Eskom Installations and Its Subsidiaries
- [3] 240-91190304 Specification for CCTV Surveillance with Intruder Detection
- [4] 240-102220945 Specification for Integrated Access Control System (IACS) for Eskom Sites
- [5] 240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom installations and Its Subsidiaries
- [6] 240-170000098 Security public address systems for substations and telecoms high sites
- [7] 240-170000691 Standard for intrusion pre-detection systems used at Eskom sites
- [8] 240-170000096 Physical security integration standard
- [9] 240-91252455 Lighting for Perimeter Security at Eskom Installations
- [10] DEM2412993 & 2425114 LAD PAC for Physical Security Information Management System (PSIM)
- [11] 240-76624513 Standard for the calibration of test Instruments used by field stuff

2.2.2 Informative

None

2.3 Definitions

2.3.1 General

None

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Description
ACB	Access Control Building
CCTV	Closed Circuit Television
IACS	Integrated Access Control System
NLEPDS	Non-Lethal Energized Perimeter Detection System
NVR	Network Video Recorder
OU	Operating Unit
PA	Public Address
PSIM	Physical Security Information Management System

2.5 Roles and responsibilities

All role players shall undertake their responsibilities as outlined below and ensure that non-conformances are addressed prior to handing over of installed system(s) to Eskom.

2.5.1 Contractor / System Commissioning Manager

The Contractor/ System Commissioning Manager shall perform the following roles and responsibilities:

- Plan the commissioning activities and communicate these to Eskom representative. The contact details of the Commissioning Manager must be made available to the Eskom representative/s.
- Notify the Eskom representative of the intention to conduct commissioning at least four weeks prior to commissioning date. The intended start date and end date of commissioning must be indicated.
- Ensure that safe work practices are implemented and provide the Eskom representative with safety clearance assurance.
- Familiarise the Eskom representative with all the installations prior to commissioning work commencing.
- Advise the Eskom representative of the Contractor's commissioning team details at least a week prior to the commissioning date (i.e., Name of commissioning persons, contact details and role in the commissioning).
- The Contractor shall make provision for comments and signatures on the commission test sheets for acceptance of the results. The results shall be co-signed by both Eskom representative and the Contractor commissioning personnel.

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2.5.2 Eskom Representative

The Eskom Representative shall perform the following roles and responsibilities:

- a) Advise the Contractor of the Eskom representative/s witnessing the commissioning and the Security Control Centre prior to commissioning date.
- b) Ensure involvement with the Contractor during meetings, system(s) communication setup including establishment of communication with the Security Control Centre.
- c) The Eskom representative is not expected to conduct any commissioning tasks or operations on behalf of the Contractor.
- d) Witness and verify with the Eskom Security Control Centre that commissioning was conducted in accordance with this standard and test results are accurately captured. The representative must be familiar with the functionality under test and the expected result from each test.
- e) The Eskom representative reserves the right to query or request a repeat of any test should there be any discrepancy or disagreement with the outcome of any test step.
- f) Notify the Contractor in writing of any defects found during commissioning. The Contractor shall confirm the defect correction date and arrange for re-testing and correction of such defects.
- g) Accept commissioning as successful through a formal signoff once all the defects have been corrected.

2.5.3 Eskom Security Control Centre Representative/s

The Eskom Security Control Centre representative/s shall perform the following roles and responsibilities:

- a) Review the security systems for correctness and alignment with Eskom's requirements.
- b) Verify streamed visuals and alarm signals such as normal and abnormal state of monitored signals/alarm.
- c) Facilitate Control room related commissioning interactions between the Contractor and Eskom Representatives.

2.5.4 Eskom Telecoms/IT Representative

The Eskom Telecoms/IT Representative shall perform the following roles and responsibilities:

- a) Allocate IP addresses for communication between site Controller and the Security Control Centre.
- b) Make provision for communication infrastructure between Site Controller and the Security Control Centre.
- c) Specify the required communication baud rates and communication protocols that shall be used for communication between the Site Controller and the Security Control Centre.
- d) Conduct end-to-end commissioning between the Security Control Centre and the Site Controller.

2.5.5 Eskom Grid/OU communication establishment responsibilities

The relevant Eskom Grid/OU shall ensure:

- a) The communication interface media is installed and tested (in consultation with Eskom Telecoms), between the Site Controller(s) and the Security Control Centre.
- b) The communication hardware including the required number of communication ports are available and installed (in consultation with Eskom Telecoms) to facilitate the required communication with the Eskom Security Control Centre.

2.5.6 Contractor communication infrastructure establishment responsibilities

The Contractor shall ensure the following:

- a) The communication interface media is installed and tested as agreed upon between the Site Controller(s) and Eskom's communication equipment.
- b) The communication hardware is installed and tested to facilitate the required communication with the Eskom Security Control Centre.
- c) The required number of communication ports and the applicable protocols are configured on the Site Controller(s).
- d) Communications must be established at least five working days prior to commissioning date.

Note: Site Controller (s) refers to various system controller(s) such as DRV, Alarm panel, PA controller etc. These can be separate Controller(s) or a single/combined Controller for Integrated Security Systems.

2.6 Process for monitoring

Physical security care group shall check applicability and effectiveness of this document.

2.7 Related/supporting documents

Not Applicable

3. Test equipment

All test equipment used for the pre-commissioning tests shall comply with the requirements of 240 76624513, Standard for the Calibration of Test Instruments Used by Field Staff.

4. Pre-Commissioning

Pre-commissioning is the process of performing testing of the installed systems to confirm the integrity of the intended design of the system. During the pre-commissioning phase, all problems shall be resolved and the system(s) shall be confirmed to be functioning as expected. This shall be conducted prior to commissioning of the security systems.

Note: Security Control Centre shall mean any Security Monitoring Centre approved by Eskom where security camera visuals and security alarms from site(s) are monitored and/or controlled. Examples of these are Zero Control, Regional Security Control Centre, security desk at Eskom Network Management Centre (NMC) etc.

4.1 Pre-commissioning documentation

On completion of the installation the contractor shall provide Eskom with the following documentation:

- a) Detailed as-built drawings of the installation including the following:
 - 1) A site layout diagram indicating the position of all equipment and devices installed. A complete cable block and wiring diagram with cable & wire numbers
 - 2) A site layout diagram indicating the position of all equipment and devices installed
 - 3) Coverage plots of the areas covered by detectors/sensors and a list and description of each zone.
 - 4) system zones
- b) Manuals and training for the system. The manuals shall include the following:
 - 1) An overview of the installed system, including the equipment block schematic
 - 2) The functions and features of each item of equipment.
 - 3) Individual operating instructions for each item of equipment.

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- 4) Detailed operating instructions for all modes of operation of the system.
- c) Manufacturer's technical and maintenance specifications for each item of equipment installed.
- d) All documents shall be provided in soft and hard copy. Drawings softcopies shall be provided as CAD files in .dwg format. Other soft copy documents shall be provided as pdfs.
- e) All system settings shall be recorded, so that they can be confirmed and reproduced as required.
 - 1) Where possible these settings and configurations shall consist of backup files which can be loaded onto the relevant equipment in the case of malfunction or replacement.
 - 2) Where the equipment does not allow for softcopy backups, an electronic document listing the settings may be provided.
- f) Hand over certificates and Certificates of Compliance (COC)s shall be provided post commissioning.

4.2 Pre-commissioning preparation checks

Before pre-commissioning can be conducted, the following shall be ensured:

- a) Factory acceptance test (FAT) must be complete and approved by Eskom.
- b) All system's databases must be completed and agreed upon.
- c) Pre-commissioning shall be in line with the commissioning procedure as outlined in this standard
- d) The commissioning procedure as drafted by the Contractor shall be accepted by all parties and distributed at least a week prior to commissioning.

4.3 Pre-commissioning requirements

- a) All security signals and alarms must be tested during the pre-commissioning stage to ensure that that all signals and alarms are working as expected.
- b) Upon completion of pre-commissioning of the security signals and alarms, a pre-commissioning check sheet shall be signed by the Contractor, and sent to the assigned Eskom representative as confirmation of the completion of this activity.
- c) There shall be no requirement for the Eskom representative to witness the pre-commissioning tests.

5. Commissioning

5.1 General

The following must be verified before commissioning commences:

- a) The agreed upon database between the Security Control Centre and Site Controller(s) has been configured.
- b) Ensure prior arrangement is made with the Security Control Centre personnel.
- c) The pre-commissioning alarm and signal list is available and populated with the agreed upon alarms and signals between the site and the Security Control Centre. Eskom representative shall ensure that all the alarms and signals listed in the pre-commissioning list have been tested.
- d) The Contractor shall ensure that pre-commissioning is complete, and the requirements stipulated above have been addressed before commissioning commences.
- e) All commissioning personnel must be informed about the commissioning at least a week before it happens to ensure availability.

- f) The contractor must ensure that the security alarms database, signal list and as built drawings are available on site to the commissioning team at least a week prior to the commissioning date.
- g) The contractor shall ensure that all the equipment has been tested and ready for initial energisation.
- h) Ensure that the communication link to the Security Control Centre is tested and there is also phone communication between Site and the Security Control Centre prior to commissioning date.
- i) A copy of the authorised pre-commissioning results must be made available to the commissioning team.

5.2 Non-Lethal Energized Perimeter Detection System (NLEPDS)

5.2.1 Test procedure

The tests inspections entail inspecting the correct installation of the various components of the NLEPDS Entrance area inspections should include inspection of the gates and associated equipment such as motors and access card readers.

- a) Access Control Building (ACB) inspections should include inspection of all the electric fence equipment in the guard house including energizers, IDFs, Relay cards etc.
- b) Perimeter inspections should include inspection of the fence posts, conductors, fence earthing, warning signs etc.
- c) Security Control room inspections should include inspection of security fence equipment in the onsite security control room including security signals IDFs and interfacing to SCADA system for remote monitoring etc.

Note: There are instances where the electric fence equipment is housed in alternative buildings where there is no ACB for the site or where there are space limitations, in such instances the inspections applicable to ACB should be conducted against the area/building in which the electric fence equipment is housed or contained.

5.2.2 NLEPDS conformance and test qualification

- 1) Electric fences shall be inspected and tested against the requirements outlined in the Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) [5] to be deemed acceptable.
- 2) Compliance check sheet(s) in Annex A shall be completed.

5.3 CCTV system

5.3.1 Non PTZ cameras Test procedure

- a) Each camera shall be tested against its intended purpose
- b) The test shall be performed by crossing the protected zone/virtual fence at multiple points.
- c) The test shall be done by walking upright, hunched and crawling through the protected zone.
- d) The distance at which the test shall start is from just before the detector's anticipated blind spot (if any).
- e) Cross the area covered by the detection system, increasing in intervals of 10m from the detector's location.
- f) Cross the area where there are distinct depressions and elevations.
- g) If the footage is to be recorded and viewed from a security control room, the tests shall be done based on control room footage and then repeated for recorded footage.
- h) The target shall be placed at the furthest point to be covered and the percentage height of the screen taken up by the target shall be determined.
- i) The resolution achieved shall be tested using a rating of 'poor/sufficient/excellent'.

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- j) The frame rate achieved shall be tested using a rating of 'poor/sufficient/excellent'.
- k) The depth of focus achieved shall be tested using a rating of 'poor/sufficient/excellent'.
- l) The colour quality achieved shall be tested using a scale of 1-10.
- m) Cameras intended for recognition or identification: The ability of a viewer to recognise/identify a human or number plate shall be tested using a human or number plate.
- n) A walk test shall be used to confirm the horizontal field of view of each camera expected from the design document. Exact dimensions of the field of view achieved shall be recorded. The design document shall be redlined and updated based on the measurements. A single sketch may be used to show the horizontal field of view of all cameras on a site / in an area (see sketch below for example).

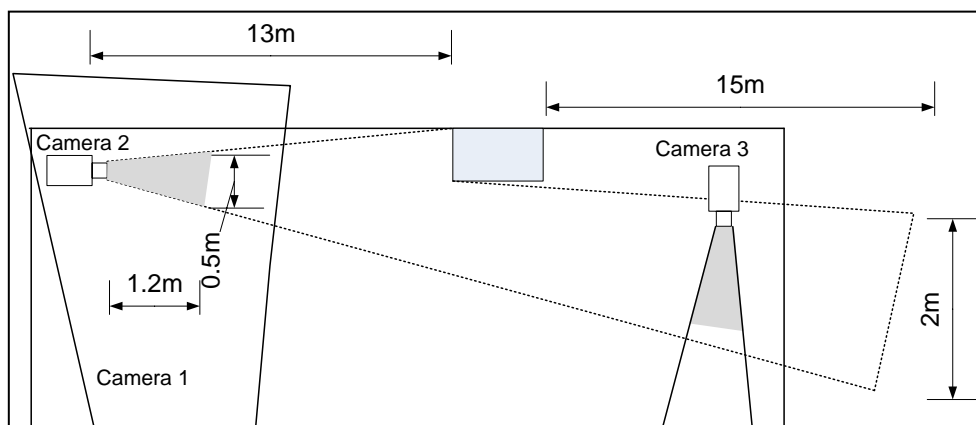


Figure 1: Cameras horizontal field of view example

- o) A walk test shall be used to confirm the vertical field of view of each camera. Exact dimensions of the field of view achieved shall be recorded. Obstacles and other cameras in field of view shall be included in the sketch. The design document shall be redlined and updated based on the measurements (see sketch below for example).

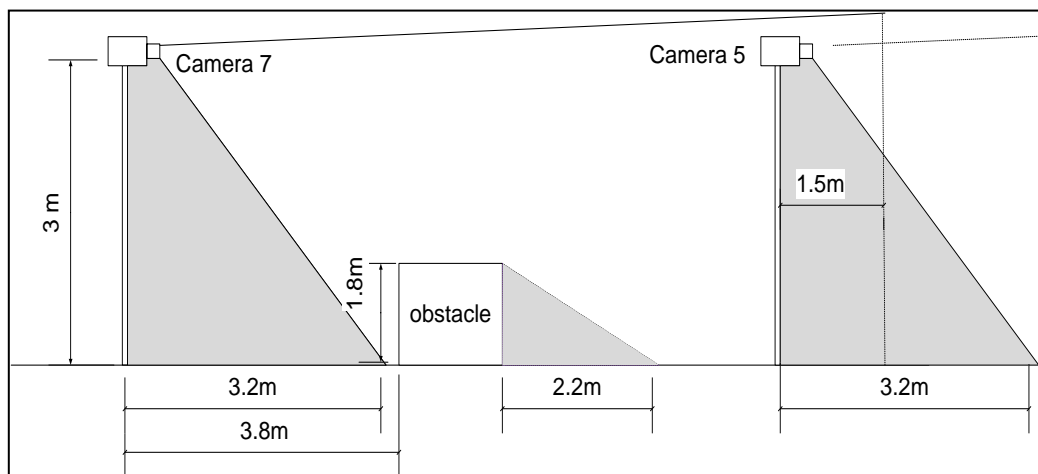
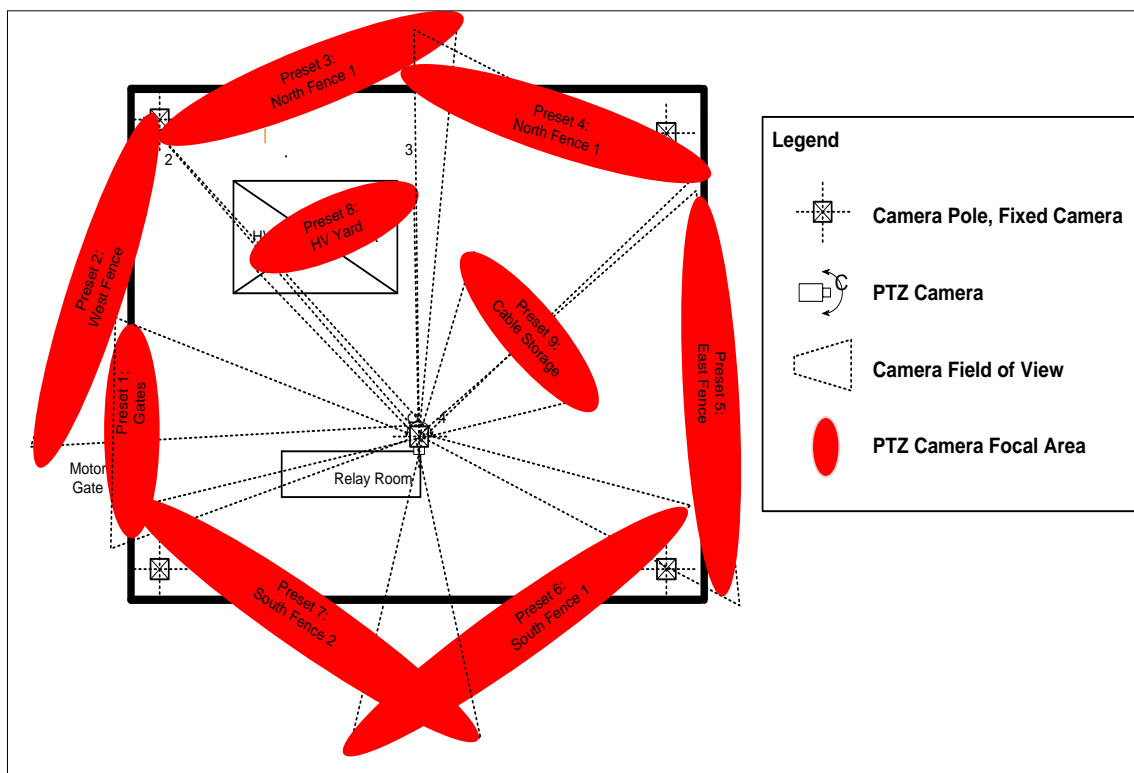


Figure 2: Cameras vertical field of view example

- p) Time stamped snapshots shall be taken from each camera to be provided for handover purposes and future reference.

5.3.2 PTZ cameras Test Procedure

- a) The control of the PTZ cameras shall be tested from within the equipment room, as well as from the security control room.
- b) Pan the PTZ camera 360° clockwise, as well as counterclockwise.
- c) Tilt the PTZ camera over the camera's full range.
- d) The PTZ camera shall also be tested to verify that it can be effectively used to enable the security control room to gather real-time information about incidents on site, and co-ordinate the response to any intrusions.
- e) A person of average height (about 1.6m) shall be used as the target for the tests.
- f) if the footage is to be recorded, and viewed from a security control room, then the tests must be done based on live control room footage, and then repeated for recorded footage.
- g) The target shall be placed at each of the areas to be covered by the PTZ pre-set positions and the effectiveness of the PTZ footage at that pre-set will be evaluated.
- h) If PTZ tracking is available, it shall be tested by a person walking and running between various positions on the site.
- i) Cameras intended for recognition or identification: The ability of a viewer to recognise/identify a human or number plate shall be tested using a human/number plate.
- j) A walk test shall be used to determine and sketch the horizontal field of view and area of focus of each preset position. A measuring tool shall be used to determine exact dimensions of the field of view achieved. Figure below shows an example sketch:

**Figure 3: PTZ camera field of view example**

- k) Time stamped snapshots shall be taken from each camera to be provided for handover purposes and future reference.

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5.3.3 NVR Test procedure

An incident on site shall be simulated and the following verified:

- a) NVR Records for 5s second before the event, the time of the actual event and 15s second after motion stops.
- b) A short video clip / series of still pictures from the camera covering the zone where the alarm triggered is sent to the security control room.
- c) The quality of the clip received at the security control room is such that the controller can clearly identify whether the intruder detection was triggered by a human.

5.3.4 CCTV conformance and test qualification

- a) The CCTV system shall be tested for conformance to the specification for CCTV surveillance with intruder detection (240-91190304).
- b) Compliance check sheet(s) in Annex B shall be completed.

5.4 Access Control System (ACS)

5.4.1 Test procedure

- a) Access shall be granted on presentation of a valid card/enrolled finger on a biometric reader.
- b) Access control shall be tested by using valid access cards and invalid cards including forceful opening of doors/entrance areas.

5.4.2 ACS conformance and test qualification

- a) The ACS shall be tested for conformance to technical specification 240-102220945: specification for integrated access control system (IACS) for Eskom sites.
- b) Compliance check sheet(s) in Annex C shall be completed.

5.5 Intrusion detection and Alarm systems

5.5.1 Test procedure

5.5.1.1 Indoor Intruder Detection Tests

- a) The test shall be performed by entering/simulating entrance into the protected area.
- b) The test shall be done by walking upright, hunched and crawling through/just in front of the potential point of entry.
- c) Verify detection for each potential entry point.

5.5.1.2 Outdoor Intruder Detection Tests

- a) The test shall be performed by crossing the protected zone/virtual fence at multiple points.
- b) The test shall be done by walking upright, hunched and crawling through the protected zone.
- c) The distance at which the test shall start is from just before the detector's anticipated blind spot (if any).
- d) Cross the area covered by the detection system, increasing in intervals of 10m from the detector's location.
- e) Cross the area where there are distinct depressions and elevations.
- f) Verify detection for each crossing of the protected zone.

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5.5.2 Intrusion and Alarm systems conformance and test qualification

- a) The intrusion and alarm systems shall be tested for conformance to the technical specifications below:
 - 1) 240-86738969: Specification for Integrated Security Alarm System for Protection of Eskom installations and its subsidiaries.
 - 2) 240-170000691: Standard for Intrusion Pre-detection Systems used at Eskom sites
- b) Compliance check sheet(s) in Annex D shall be completed.

5.6 Security Lights

5.6.1 Test procedure

- a) Security lights shall be tested to confirm required functionality and good workmanship.

5.6.2 Security lights conformance and test qualification

- a) The security lights shall be tested for conformance to technical specification 240-91252455: Lighting for Perimeter Security at Eskom Installations.
- b) Compliance check sheets in Annex E shall be completed.

5.7 Public Address (PA) System

5.7.1 Test procedure

- a) Public Address system shall be tested to confirm required functionality and good workmanship.
- b) The PA system shall be tested from within the site security equipment room, as well as from the remote security control room.
- c) An employee shall speak over the PA system in the guard house while another employee shall stand next to the wall to listen and determine the clarity of the PA system.
- d) A sentence shall be said over the system while an employee is positioned at each corner of the site, on all corners of the site and at any identified critical positions where there may be obstacles or obstructions that may buffer, distort or echo the audio coming from the speakers.
- e) The employee shall confirm whether the sentences heard were the same as what was said. This shall be done by writing down what was heard and correlating on completion of the test.
- f) Verify whether the clarity and volume of the audio is acceptable and can be well distinguished from any surrounding noise that may exist in the area such as transformer hum and corona noise.
- g) The test shall be repeated with the person speaking from offsite at the remote security control room.

5.7.2 Public Address system conformance and test qualification

- a) Public Address shall be tested for conformance to technical specification 240-170000098: Security public address systems for substations and telecoms high sites
- b) Compliance check sheets in Annex F shall be completed.

5.8 Intercom System

5.8.1 Test procedure

- a) Intercom system shall be tested for connectivity to the site security control room as well as the remote security control centre.

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5.8.2 Intercom system conformance and test qualification

- a) Intercom system shall be tested for conformance to technical document 240-102220945: Specification for Integrated Access Control System (IACS) for Eskom Sites.
- b) Compliance check sheets in Annex G shall be completed.

5.9 Physical security information management system (PSIM)

5.9.1 Test procedure

- a) Connectivity between site level subsystems and the PSIM system (both locally and remotely) shall be tested.

5.9.2 PSIM conformance and test qualification

- a) PSIM shall be tested for conformance to technical document DEM2412993 & 2425114: LAD PAC for Physical Security Information Management System (PSIM)
- b) Compliance check sheets in Annex H shall be completed.

5.10 Switches

5.10.1 Test procedure

- a) Switches shall be tested as per manufacture's recommendations.

5.10.2 Switches conformance and test qualification

- a) Compliance check sheets in Annex I shall be completed.

5.11 Non-conformance process

- a) If a piece of equipment/system does not pass a commissioning test, the supplier will be allowed to retune/reconfigure the system/equipment. If, when retested, the system still fails, the supplier will be allowed to make minor redesigns / equipment changes where necessary (and subject to governance procedures). If, after implementing the design changes, the requirements can still not be met, the non-conformance process shall be followed.

6. Post commissioning changes

There shall be no changes made to any of the System's installations/configurations without prior knowledge and notice given to relevant security and engineering departments.

6.1.1 Security systems change control

- a) Any changes to be made on a commissioned security system shall be reported to the relevant Security and Engineering departments at least one week before commencement of work related with such changes.
- b) All the details of modifications made to the commissioned systems including system upgrades shall be reported to the relevant Security and Engineering departments on completion and documents with detailed changes made shall be kept safe.

7. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Remone Govender	Middle Manager - Group Security
Justice Ramanyoga	Middle Manager DX security
Monette Heath	Middle Manager GX security
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Cornelius Naidoo	Middle Manager – Telecommunication and Physical Security T&S
Johan Pieterse	Chief Engineer – TX Secondary Plant, Work Planning and Centralised Services

8. Revisions

Date	Rev.	Compiler	Remarks
Aug 2023	1	R Moshoeshoe	<ul style="list-style-type: none">Updated the document to include new systemsUpdated the document number

9. Development team

The following people were involved in the development of this document:

- Victor Lehobo
- Joe Verissimo
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- Que Qutjwa
- Kgotso Moloi
- Matsobane Phosa
- Sifiso Dlalisa

10. Acknowledgements

Not Applicable

Annex A – NLEPDS Commissioning checks**1) NLEPDS information sheet**

NLEPDS Installation Info Sheet			
Site Name:			
Physical Address:			
Energizer OEM:			
Energizer brand:			
IP Address (where applicable):			
Number of energizers:			
Number of zones:			

2) NLEPDS General Visual Inspections

The NLEPDS shall be visually inspected against the requirements as listed in the table below:

Number	NLEPDS section Name	Expected installation	Pass/Fail
1	Entrance Area		
1.1	Automatic sliding gates	Automatic sliding gates shall be installed	
1.2	Sliding gate motor	Heavy duty sliding gate motors for each gate shall be installed	
1.3	Sliding gates Motor safety	The electric drive shall have a mechanical disengage mechanism that allows the gate to be opened and closed manually in the event of power failure. The manual disengage facility shall be locked with a padlock under normal conditions.	
1.4	Enclosure for the motor	Motor enclosure to be concreted above ground level, to supplier specification. Motor housing, crank and fittings shall be fully galvanized. Cable entry points to the housing shall have water-tight fittings.	
1.5	Tamper protection for the motors	The enclosure shall have a locked cover that gives access to the operating mechanism, gears, etc.	
1.6	Reed switches	Industrial heavy duty magnetic reed switches on all 3 gates for open/close indication shall be installed	
1.7	Reed switch status	The status detector mechanism shall indicate correctly whether the gate is open or closed.	
1.8	Anti-theft brackets	anti-theft bracket for each gate motor shall be installed	
1.9	Infrareds(IR) units	Infrareds(IR) units to prevent collision (2 sets of infrareds per gate) shall be installed	
1.10	High voltage sliding gate contact	high voltage sliding gate contact(in line HT gate contact) for the gates shall be installed	

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Number	NLEPDS section Name	Expected installation	Pass/Fail
1.11	Goose necks	Goose necks shall be installed	
1.12	Sliding gate speed	A sliding gate drive shall move the gate at a speed of at least 10 m per minute.	
2	Access Control building/Guard house		
2.1	Energizer enclosures	Energizers enclosures shall be installed for safety	
2.2	Multizone energizers	Multizone energizers shall be installed	
2.3	Energizers Synchronizing unit	The synchronising unit shall be used to synchronize multiple energizers in order to be regarded as one energizer with multiple outputs, all firing at the same time, as one single pulse.	
2.4	Relay cards	Relay cards for grouped alarms shall be installed	
2.5	Relay boards for switching on perimeter lights	Relay boards for switching on perimeter lights via contactors shall be installed	
2.6	Contactors, connection terminals between energizers relay outputs and security lights	Contactors, connection terminals between energizers relay outputs and security lights for switching on perimeter lights zones during alarms shall be installed	
2.7	Energizer signals IDF	Energizer signals IDF shall be installed	
2.8	Fence mimic	A mimic for showing fence zones shall be installed	
2.9	Reset & acknowledgement buttons	Reset & acknowledgement buttons for alarms shall be installed	
2.10	Air conditioner for ACB	Air conditioner for ACB equipment shall be installed	
2.11	Earthing and associated equipment	Earthing for ACB, Energizers, energizer cabinets shall be done correctly	
2.12	Termination of cables	Cables shall be properly terminated	
3	Control Room		
3.1	security signals on the IDF	Security signals on the IDF shall be allocated and labelled	
3.2	database update for security systems signals	database update for security systems signals shall be done by the Control Systems personnel	
Comments:			

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3) Alarming requirements

Electric fence signals testing to zero control should be done by the control systems personnel as stipulated in the technical specification (240-78980846). Correct detection and monitoring of the alarms from the security control centre should be verified. The list of alarms that should be tested is shown in the below:

Alarm Type	Duration	Description	Condition	Pass/Fail
Status	Continuous	System-on (for each energizer)	Energizer powered	
Status	Continuous	Energizer armed (for each energizer)	HV exists on the energizer unit.	
Alarm	Momentary	Fence intrusion alarm (for each zone)	Alarm condition detected (Min. latching time of 1s)	
Control	Minimum 50ms	System reset for each zone	System and alarm reset input	
Alarm	Continuous	Battery low (for each energizer)	Battery voltage less than minimum voltage	
Alarm	Continuous	Mains supply fail	AC power fail	
Comments:				

4) Non-lethal requirements testing

The electric fence system is required to comply with the requirements of the Occupation Health and Safety Act; as such the tests listed in table 3 below should be conducted and verified.

No.	Energizer Requirement	Pass/fail
1	Peak value of voltage must be above 7.5kV, but not exceeding 10kV with the energizer not connected to the load (fence).	
2	Maximum energy delivered to a load of 500Ω must not be less than 7,5 J but not exceeding 8 J with the energizer not connected to the load (fence).	
3	The required energy on each live conductor / trace wire on the NLEPD structure must not be less than 5 J, with a minimum Differential Potential of 7 kV.	
4	Minimum interval between impulses should not be less than 1,0 Hz.	
5	Impulse duration shall not exceed 10 ms.	
6	The energizer unit shall have potential free contacts to switch off the HV of the electrified fence.	
Comments:		

Annex B – - CCTV System Commissioning checks**1) Cameras**

Camera Installation Info Sheet			
Site Name:			
Physical Address:			
Floor/Building:			
Camera Type:			
Camera Name:			
IP Address:			
Camera Position:			
Time Server (where applicable):			
Firmware Updated:	Yes/No		
Camera Commissioning			
Lens:			
POE:			
Camera Number:			
Focused:			
Alarm Configurations:			
Recording:			
Functionality			
Standard Functions: Please Comment and Test			
Task Description	Pass/Fail		
Check Camera Mount Secure			
Camera Factory Lens Covers/Stickers Removed			
Camera Field of View Adjusted Accordingly			
Camera Lens and Housing Secure and Clean			
Confirm labelling Done			
Control and function tests of cameras in PSIM			
Device Trigger Tests			
Check for Viewing Risks, trees, obstructions etc.			
Camera Specific Zones			
Date & Time Correctness			
Confirm that all passwords have been changed from the default setting			
PTZ Control & Touring Tests (PTZ Cameras Only) both locally and remotely			
Comments:			

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2) NVR

NVR Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
NVR Type:		
NVR Name:		
IP Address:		
NVR Position:		
Time Serve (where applicable):		
No of Channels		
No of HDD's		
Firmware Updated:	Yes/No	
NVR Commissioning		
IP Address Set	Pass/Fail	Comments
Parameters Saved		
Date/Time Set		
Time Zone Set		
System Messages		
Link to Central Control Room		
Recording Setup/HDD Setup		
Password		
Interface to PSIM		
Recordings are electronically watermarked		
Recordings show correct time and date		
It is possible to search recorded events based on date and time; event; motion in specific area; or a combination.		
Playback in slow motion is possible		
Playback at high speed is possible		

Users can play recorded video from several cameras simultaneously		
It is possible to 'cut' footage to export only the portion of footage that is of interest		
All cameras on site are synced to within 1 second of NVR time		
The quality of streaming video obtained at the security control room shall be allow for observation of site by control room.		
Security control room is able to access PTZ pre-set positions		
NVR can simultaneously record and stream footage		
NVR Records for 5s second before the event, the time of the actual event and 15s second after motion stops.		
Comments:		

Annex C – Access Control System commissioning checks

Access Control System Installation Info Sheet			
Site Name:			
Physical Address:			
Floor/Building:		Controller Name:	
Controller Type:		Controller Position:	
IP Address:		Number Of Access Doors:	
Type of Card Reader:		Number Of Card Readers:	
		Type of Card/biometric Reader:	
Date Of Download:			
Controller Working:		Yes/No	
Download Of Parameters complete:		Yes/No	
Card/biometric Reader Definition			
Card/biometric Reader number:	Card Reader Label:	Card Reader Definition (Entry/exit):	
Controller Outputs			
Output number:	Output Label:	Output Definition	
Controller Inputs			
Input number:	Input Label:	Input Definition	
Functionality			
Standard Functions: Please Comment and Test			
Task Description			Pass/Fail
Device Mounting Secure			
Device Position and Height Correct			
Device Triggered with Approved Access			

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Device Triggered with Denied Access	
Battery Installed and Connected	
Break Glass Unit Functionality Tested	
Labels Verified	
PSIM Functionality Tests	
Alarm Panel Integration Test	
Comments:	

Annex D – Intrusion and alarms systems commissioning checks**1) Intrusion alarms system**

Intrusion and alarm system Installation Info Sheet			
Site Name:			
Physical Address:			
Floor/Building:			
Alarm Panel Type:			
Alarm Panel Name:			
IP Address:			
Alarm Panel Position:			
Time Server (where applicable):			
Firmware Updated:	Yes/No		
INTRUSION and Alarm systems Commissioning			
IP Address Set			
Parameters Saved			
Date/Time Set			
Link to Guard X Software			
Installers PIN			
Users PIN			
Alarm trigger	Alarm point name & Zone		
Door Magnet		ZONE #:	PARTITION #:
PIR Detector		ZONE #:	PARTITION #:
ACS Disarm Zone		ZONE #:	PARTITION #:
Siren Tamper		ZONE #:	PARTITION #:
Panel Tamper Zone		ZONE #:	PARTITION #:
Functionality			
Standard Functions: Please Comment and Test			
Task Description			Pass/Fail
Panel & Devices Mounted Securely			
Alarm Panel Power Supply Connected and Operational			
Alarm Panel Battery Installed and Connected			
Labelling Confirmed			
Cabling Neatly Installed			
LCD Keypad Installed and Operational			

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Arming/Disarming Tested	
PSIM Functionality Tested	
Test and map the detection range of all intrusion sensors.	
Test that zones are mapped and labelled correctly	
Test that there is an audible confirmation from the siren when the system is triggered	
Test that the alarm status (armed/disarmed) is visible at the security control room	
Comments:	

2) Perimeter Intrusion Detection System (PIDS)

PIDS Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
Device Type:		
Device Zone:		
Device Count Range:		
Firmware Updated:	Yes/No	
PIDS Commissioning		
Sensor/detector Connection Set		
Parameters Saved		
Device Active		
Functionality		
Standard Functions: Please Comment and Test		
Task Description	Pass/Fail	
Device Mounted Securely		
Battery Installed		
Calibrated and Configured		
PSIM Functionality Tested		
Comments:		

3) Integrated Alarm cause and effect matrix

	Unauthorised Access					Authorised Access	Pass/Fail/NA	Comments
	Breach physical perimeter fence or virtual perimeter fence by smart cameras/beams/etc	Outdoor Sensor Triggers	Camera Outdoor Protected Area Triggers	Indoor Sensor Triggers	Camera Indoor Protected Area Trigger			
Perimeter flood lights activated at night only	✓							
Substation flood lights activated at night only	✓	✓	✓	✓				
Security floodlights activated at night only	✓	✓	✓	✓				
Control Room lights 24hr				✓	✓			
Switch Room lights 24hr				✓	✓			
Any other indoor room				✓	✓			

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DVR/NVR record footage	✓	✓	✓	✓	✓	✓		
Alarm signals(text and video) sent to Security Control Center	✓	✓	✓	✓	✓			
PTZ tracking sent to Security Control	✓	✓	✓					
PA System recorded message activated	✓			✓	✓			
PA System Security Control operated if positive alarm verified	✓	✓		✓	✓			
Alarm System Zones triggered	✓	✓	✓	✓	✓			
Alarm Zone events sent to Security Control	✓	✓	✓	✓	✓			
Indoor Siren automatically activated				✓				
Strobe light automatically activated	✓	✓	✓	✓	✓			

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Annex E – Security lights commissioning checks**1) Security lights installation details**

Security lights Installation Info Sheet		
Site Name:		
Physical Address:		
Security lights OEM:		
Security lights brand:		
IP Address (where applicable):		
Number of lights:		
Number of zones:		
Lights installation & Functionality		
Standard Functions: Please Comment and Test		
Task Description	Data/Comments	
Lights Mounting Secure		
Lights Position and Height Correct		
Lights Triggered on alarming		
Lights Labels Verified		
PSIM Functionality Tests		
Alarm and fence Panel Integration Test		
Comments:		

Annex F – Public Address System commissioning checks

PA system Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
Speaker Type:		
Speaker Name:		
IP Address:		
Speaker Position:		
Time Server (where applicable):		
Firmware Updated:	Yes/No	
PA system Commissioning		
IP Address Set	Pass/Fail	
Parameters Saved		
Date/Time Set		
UTP Link Connected and Online		
Web Access Link		
Username		
Password		
Live Announcement (both locally and remotely)		
Recorded Announcement		
PA system Functionality		
Standard Functions: Please Comment and Test		
Task Description	Pass/Fail	
Speaker Mounted Securely		
Cabling Terminated and Connected		
Labelling Confirmed		
Microphones Connected and Tested		

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Audio Test Completed with no Distortions Detected	
Microphone Audio Tested with Clear Speech	
Volume Levels Checked & Adjusted where required	
PSIM Functionality Tested	
Live Announcement (both locally and remotely)	
Recorded Announcement	
Comments:	

Annex G – Intercom System commissioning checks

Intercom system Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
Intercom Type:		
Intercom Name:		
IP Address:		
Intercom Position:		
Time Server (Where applicable):		
Firmware Updated:	Yes/No	
INTERCOM system Commissioning		
IP Address Set		Pass/Fail
Parameters Saved		
Date/Time Set		
Time Zone Set		
Link to Local Security Control Room Master tested		
Link to remote Security Control Room Master tested		
Password set		
Intercom system Functionality		
Standard Functions: Please Comment and Test		
Task Description	Pass/Fail	
Device Mounted Securely		
Intercom Call Test Confirmed and Audible		
Intercom Volume Correct		
Labelling Confirmed		
Comments:		

Annex H – PSIM commissioning checks**1) PSIM Server checks**

PSIM SERVER Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
Server Model:		
Server Name:		
IP Address:		
Server Position:		
Time Server (where applicable):		
Serial Number:		
Model Number:		
Operating System Installed:		
PSIM SERVER Commissioning		
IP Address Set		Pass/Fail
Date/Time Set		
Time Zone Set		
Firewall In Place		
Links Connected		
Username		
Password		
Interface to PSIM		
PSIM SERVER Functionality		
Standard Functions: Please Comment and Test		
Task Description		Pass/Fail
Server Mounted Securely		
Server Cables Connected and Neat		
Operating System Installed & Licenced		
Supporting Software Installed & Licenced		
Server Clean and Free of Dust		
Labelling Confirmed		
User Administration / Right Management		
Event & Alarm Management		
Control and function tests of all datapoints interfaces and sub-systems in PSIM		
Graphics		
Archiving		

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Video Handling	
Reporting	
Workflows	
Software Security	
Update Manager	
Comments:	

2) PSIM Firewall checks

Firewall Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
Firewall Model:		
Firewall Name:		
IP Address:		
Firewall Position:		
Time Server (where applicable):		
Serial Number:		
Model Number:		
Operating System Installed:		
FW Commissioning		
IP Address Set		Pass/Fail
Date/Time Set		
Firewall In Place		
Links Connected		
Username		
Password		
Static Routes Configured		
Firewall Policies Configured		

Firewall Functionality	
Standard Functions: Please Comment and Test	
Task Description	Pass/Fail
FW Mounted Securely	
FW Cables Connected and Neat	
Supporting Software Installed & Licenced	
Labelling Confirmed	
Routing and Configuration test	
Comments:	

3) Workstations checks

WORKSTATION Installation Info Sheet		
Site Name:		
Physical Address:		
Floor/Building:		
Workstation Model:		
Workstation Name:		
IP Address:		
Workstation Position:		
Time Server (where applicable):		
Serial Number:		
Model Number:		
Operating System Installed:		
WORKSTATION Commissioning		
IP Address Set		Pass/Fail
Date/Time Set		
Time Zone Set		
Firewall In Place		
Links Connected		

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Username		
Password		
Interface to PSIM		
Workstation Functionality		
Standard Functions: Please Comment and Test		
Task Description	Pass/Fail	
PC Mounted Securely		
PC Cable Connected and Neat		
Operating System Installed & licenced		
Supporting Software Installed & licenced		
Workstation Clean and Free of Dust		
labelling Confirmed		
Comments:		

Annex I – Switches commissioning checks**Switch Installation Info Sheet**

Site Name:

Physical Address:

Floor/Building:

Switch Type:

Switch Name:

IP Address:

Subnet/Gateway:

Switch Position:

Firmware Upgraded

Yes/No

Switch Commissioning

Commissioning	Spare/Copper/Fibre	POE/GBIC	Device attached	IP Of Device	Notes
<u>Port 1</u>					
<u>Port 2</u>					
<u>Port 3</u>					
<u>Port 4</u>					
Port 5					
Port 6					
Port 7					
Port 8					
FP 1					

Switch Functionality**Standard Functions: Please Comment and Test**

Task Description	Pass/Fail
Switch Mounted Securely	
Switch Cables Connected and Neat	
Power Cable Connected and Switch Online	
Fibre Link Online	
Switch Clean and Free of Dust	
labelling Confirmed	
Comments:	