Eskom	Specification	Generation

Title: **Kusile Power Station Installation of Additional CCTV Cameras Specification**

Unique Identifier:	**KUS-20240254**
Alternative Reference Number:	**N/A**
Area of Applicability:	**Engineering**
Documentation Type:	**Specification**
Revision:	**1**
Total Pages:	**22**
Next Review Date:	**N/A**
Disclosure Classification:	**CONTROLLED DISCLOSURE**

Compiled by	Functional Responsibility	Authorised by
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Date: 22 Febraury 2024	Date: 22.02.2024	Date: 25 Feb 2024

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TABLES

1. INTRODUCTION

CCTV systems provide surveillance capabilities used in protection of people, assets, and systems. A CCTV system serves mainly as a security force multiplier, providing surveillance for a larger area, more of the time, than would be feasible with security personnel alone. CCTV systems are often used to support comprehensive security systems by incorporating video coverage and security alarms for barriers, intrusion detection, and access control. For example, a CCTV system can provide the means to assess an alarm generated by an intrusion detection system and record the event.

The cameras installed at Kusile Power Station are not enough to cover all critical areas, the various stakeholders have identified more areas that require surveillance for protection of people, plant, systems, and monitoring of critical plants where visuals will help controllers to manage and control the plant better.

To design such an integrated system with required interfaces, a comprehensive site survey to support the development of detailed equipment specifications, installation design, and ultimately a thorough system test requires a specialised skill set. These skills and capabilities cannot be sourced within the organisation.

1.1 IDENTIFICATION

The areas will be identified for the additional CCTV cameras at Kusile Power Station. The composition of these areas will consist of a combination of cameras covering them and will be as follows Table 1

Table 1: Location of required cameras and their function

AREA (Location)	Env.	Lens	Power	House	Mount	Mon. Type	Tx	Store	Camera Type (*)	Quantity (*)	Unit Price (Rands)	Monitoring Centre (Display)	Function	
													Monitoring	Security (Honeywell Interface)
Limestone Stockyard												BOP Control Room	x	
Limestone Hopper Offloading Facilities													x	
Limestone Conveyor 3													x	
Four Dewatering Lines at FGD, including Head Ends												FGD Control Room	x	
Dewatering Building													x	
Gypsum Transfer Houses													x	
Reagent / Ball Mill Areas													x	
Recirculation Pumphouses													x	
Coal Weighbridge Offices												BOP Control Room	x	
Coal Offloading and Weighbridge Areas													x	
Coal Stockyard													x	
Drum Reclaimers													x	
Buffalo Feeders													x	
Coal Belts from stockyard up to Units													x	
Submerged Scraper Conveyors													x	

*Note: this information to be filled by the Contractor as part of the submission.

AREA (Location)	Env.	Lens	Power	House	Mount	Mon. Type	Tx	Store	Camera Type (*)	Quantity (*)	Unit Price (Rands)	Monitoring Centre (Display)	Function	
													Monitoring	Security (Honeywell Interface)
Terrace Ash Conveyor												BOP Control Room	x	
Radial Stacker Areas													x	
Fuel Offloading Station													x	
Coal Transfer Houses													x	
Station Lifts												Main Control Room (EOD)	x	
Outside Switchgear/Equipment Rooms													x	
Cable Tunnels												Security Building (North Gate)		x
Dam Pumphouse Buildings														x
Bulk Diesel Tank Area														x
New Diesel Management Facility														
Coarse Ash Conditioners												BOP Control Room	x	
Top of Ash Silos													x	
Ash Conditioners at BOP													x	
Ash Emergency Stacker													x	
Overland Link Conveyor and Discharge Points													x	

*Note: this information to be filled by the Contractor as part of the submission.

1.2 SYSTEM OVERVIEW

A Closed-Circuit Television (CCTV) system is a comprehensive and sophisticated surveillance solution designed to enhance security and monitoring capabilities for various environments and plant areas within the parameters of Kusile Power Station. This system will employ video cameras, digital video recorders (DVRs), and associated components to capture, record, and manage visual information. Supporting Clauses

2. SCOPE

The scope of this document is limited to the additional CCTV surveillance system and strategic listed areas at Kusile Power Station. The design for the surveillance camera system shall consider the following:

2.1 CAMERAS

Specifications for cameras strategically placed to cover the identified critical areas in Table 1.

Table 2: Minimum specifications for cameras

Characteristics	Requirements
AGC	At least 30dB.
BLC	Back light compensation must be implemented.
Coverage Distance	The camera's specified coverage distance shall be 10% further than is required by the site design.
Frames Frequency	Minimum 8 fps
Lens	The lens shall be chosen to suit the application and the functional requirements of the site.
ONVIF Compliance	If cameras are IP Cameras, they shall be ONVIF compliant. It must however be noted that ONVIF compliance does not guarantee compatibility between systems.
Image Format	1/3 inch or larger.
Remotely Configurable	All cameras' settings (except focal length and focus) shall be remotely configurable, either via the DVR, or directly using Ethernet.
Resolution	A minimum horizontal resolution of 600 TV lines or 800 pixels.
SNR	The signal to noise ratio shall be ≥ 52dB.
WBC	Camera shall implement wide dynamic range and white balance control functionality to compensate for bright areas.
Wide Dynamic Range	Camera shall have Wide Dynamic Range.
Scalability and Flexibility	Camera shall cater for future expansions.
Environmental Damage Resistance	Camera sensor shall be protected from environmental damage. Mechanical Shutters are susceptible to failure and will not be accepted.

NB: all cameras shall have a 360-degree coverage and motion detection for comprehensive surveillance.

2.1.1 Recording and Storage

i. Continuous recording with configurable frame rates and resolutions.
ii. Storage capacity to retain footage for a minimum of 30 days/month.
iii. Redundant storage solutions for data backup.

2.1.2 Network Infrastructure

i. Integration with the existing power plant network.
ii. Scalability to accommodate future expansion.

iii. Network security measures, including encryption and secure access protocols.

2.1.3 Monitoring and Control

i. Centralized monitoring station with a user-friendly interface (suitable location to be proposed/identified).
ii. Real-time monitoring capabilities for security personnel.
iii. Remote access for authorized personnel (names to be provided by the Client).

2.1.4 Integration

i. Seamless integration with access control systems, alarms, and other security infrastructure.
ii. Compatibility with industry-standard and national Key Point protocols.

2.1.5 Power Supply

i. Power-over-Ethernet (PoE) support for simplified installation.
ii. Backup power solutions to ensure continuous operation during power outages.

2.1.6 Compliance and Standards

The surveillance camera system must comply with relevant security, industry standards and regulations, including but not limited the list section 2.3. The contractor shall provide documentation certifying compliance with these standards.

2.1.7 Installation, Commissioning and Maintenance Requirements

2.1.7.1 Installation Plan

i. Detailed installation plan outlining camera placement, cabling, and mounting specifications.
ii. Compliance with safety regulations during the installation process.

2.1.7.2 Commissioning

i. Comprehensive testing and calibration of all cameras.
ii. System verification to ensure proper functioning.

2.1.8 Maintenance and Support

2.1.8.1 Warranty

i. Minimum 8 to 10 years warranty for all hardware components.
ii. Schedule for maintenance and requirements.

2.1.8.2 Maintenance Services

i. Regular maintenance schedule to ensure optimal system performance and availability.
ii. Prompt response times for issue resolution.

2.1.9 Documentation

The contractor shall provide comprehensive documentation, including but not limited to:

i. System architecture diagram.
ii. User manuals for system operation and troubleshooting.
iii. As-built documentation.

NB: Documentation formatting and labelling requirements shall be as per the Eskom requirements to be provided to the successful contractor.

2.2 PURPOSE

The purpose of this document is to outline the technical specifications for the installation of a comprehensive surveillance camera system at Kusile Power Station. The surveillance system is intended to enhance the security measures at the power plant, ensuring the safety of personnel, protecting critical infrastructure, and enabling effective incident response.

2.2.1 Applicability

This document shall apply to all stakeholders involved and authorized in the safety of personnel and plant at Kusile Power Station.

2.2.2 Limitations of this Revision

Areas identified in Table 1 may not be a comprehensive or exhaustive list at the time of compiling and publishing this document. Accessibility might be a challenge in some areas of the plant due to plant conditions from operations.

2.3 NORMATIVE AND INFORMATIVE REFERENCES

2.3.1 Normative

The applicable documents are listed in **Error! Reference source not found.**, Table 4, Table 5 and Table 6 below. These documents (of the specific indicated revision) form part of this specification.

This section does not include documents cited in other sections or appendices of this specification, documents that are recommended for additional information or documents that serve as examples.

In the event of a conflict between the text of this specification and the applicable parts of the documents listed below, the text of [3] takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations, unless a specific exemption has been obtained from the relevant authorities.

Table 3: Applicable Standards and Codes

Document title	Document number	Revision
[1] Video Surveillance Systems for use in Security Applications.	BS EN 62676-4	
[2] Electrical security installations - CCTV installations – CCTV surveillance systems for use in security applications.	SANS 10222-5:2007	

Table 3: Applicable Eskom Documents

Document title	Document number	Revision
[3] Specification for CCTV Surveillance with Intruder Detection.	240-91190304	2
[4] Information Security - IT/OT Remote Access Standard	32-373	
[5] Cyber Security Configuration Guideline of Networking Equipment for Operational Technology	240-91479924	
[6] Specification for Electrical Terminal Blocks	240-70413291	
[7] Definition of operational technology (OT) and OT / IT collaboration accountabilities	240-55683502	
[8] Cyber security standard for Operational Technology	240-55410927	

Table 4: Other Applicable Documents

Document title	Document number	Revision
[9] Kusile Power Station Electrical Tunnel/Trench (Conceptual layout)	146838 ES 00071	A

2.3.2 Informative

The following documents as listed in Table 5 **Error! Reference source not found.**, although not invoked in this specification, provide additional information or examples.

Table 5: References

Document title	Document number	Revision
[10] Video surveillance systems for use in security applications.	IEC EN62676-4	
[11] IEEE Guide for Developing System Requirements Specifications.	IEEE Std1233	1998
[12] Systems and software engineering, Life cycle processes, Requirements engineering.	ISO 29148	2011
[13] European Standard: Alarm systems.	EN 50132-1	2010
[14] Planning, design, installation and operation of CCTV Surveillance Systems	BSIA	2014
[15] Quality Management Systems	ISO 9001	

2.4 DEFINITIONS

2.4.1 Disclosure Classification

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

Table 6: Definition of Terms

Term	Definition
Automatic Gain Control	Automatic gain control (AGC) increases the cameras sensitivity automatically when the ambient light deteriorates.
Availability	Relates to the ability of the system-of-interest to be accessed and operated when needed.
Back Light Compensation	Electronically compensates for high background lighting to give details which would normally be silhouetted.
CCTV Camera	The unit that contains an imaging device that produces a video signal from an optical image.
CCTV system	A system that consists of camera equipment as well as any monitoring and associated equipment for transmission and controlling purposes that is necessary for surveillance of a defined security zone.
Constrained	A statement that expresses measurable bounds for an element or function of the system. That is, a constraint is a factor that is imposed on the solution by compulsion and may limit or modify the design changes.
Coverage Distance	The distance covered visually between a fixed camera's position and the next camera.
Frames Frequency	The number of frames per second (fps).
Maintainability	Relates to the ability of the intended system to be easily serviced or repaired, including the ability to be easily diagnosed. In this context, maintainability is synonymous with 'Repairability' or 'Serviceability'.
May	Expresses a non-mandatory suggestion with optional compliance by the implementer.
Must	Preferably not used in requirement statements. If both "shall" and "must" are used there is an implication of difference in the degree of responsibility upon the implementer, which is undesirable.
ONVIF Compliance	ONVIF is an international specification with the aim of 'promoting and developing global standards for interfaces of IP-based physical security products.
Reliability	Relates to the ability of the intended system to perform within the specification limits with correct and consistent results over time. This includes the numerical reliability characteristics (with confidence levels, if appropriate).
Remotely Configurable	Ability to change camera settings through a network.
Shall	Expresses a mandatory demand or a binding requirement.
Should	Expresses a non-mandatory preference, desire, target or recommendation. Other implementations of the requirement can be accepted, but the implementer (if challenged) should be able to demonstrate that these other implementations are equivalent or better.
Signal to Noise Ratio	The ratio between useful television signal and disturbing noise signal.
White Balance Control	Automatically adjusts a colour camera's colour to maintain white areas.
Wide Dynamic Range	Ability of camera to provide clear images when there are very light and very dark areas simultaneously in the camera's field of view.
Will	Expresses the future tense or a declaration of intent. For example, "The operator will initialise the system by…" conveys an item of information for the designer but it does not constitute a requirement on the designer.

2.5 ABBREVIATIONS

Abbreviation	Description
AGC	Automatic Gain Control
CCTV	Closed-Circuit Television
DVM	Digital Video Manager

Abbreviation	Description
DVR	Digital Video Recorder
FPS	Frames per Second
LCD	Liquid Crystal Display
ONVIF	Open Network Video Interface Forum
RAM	Reliability, Availability and Maintainability
SNR	Signal to Noise Ratio
WBC	White Balance Control

3. SYSTEM REQUIREMENTS

The components that are common to the existing and the extension system and are required for the entire system to operate are not listed since they are already available. The extended CCTV system can be broken down into four parts. These parts indicate the chain of signalling to provide the footage from the cameras to where the footage is required.

Monitoring Stations: These are the points where a human operator accesses the live and archived/recorded footage from the cameras. These are the access points for the system, and they are made up of the physical machines and the software running on them. Desks and chairs are not included.

Camera Servers: The DVM Camera Servers run the DVM camera server software package which allows interfacing to cameras, analytics, and basic camera administration, amongst others.

Network and Cabling: This consists of network switches and the wired or fibre links joining the network components to each other and to the existing network. Included are the cable trunking, conduits and supports for the conduits.

Field Devices: These include the cameras installed in the area to be monitored as well as supporting equipment e.g., illuminators, supports, shields etc.

3.1 SYSTEM DEFINITION

3.1.1 Context

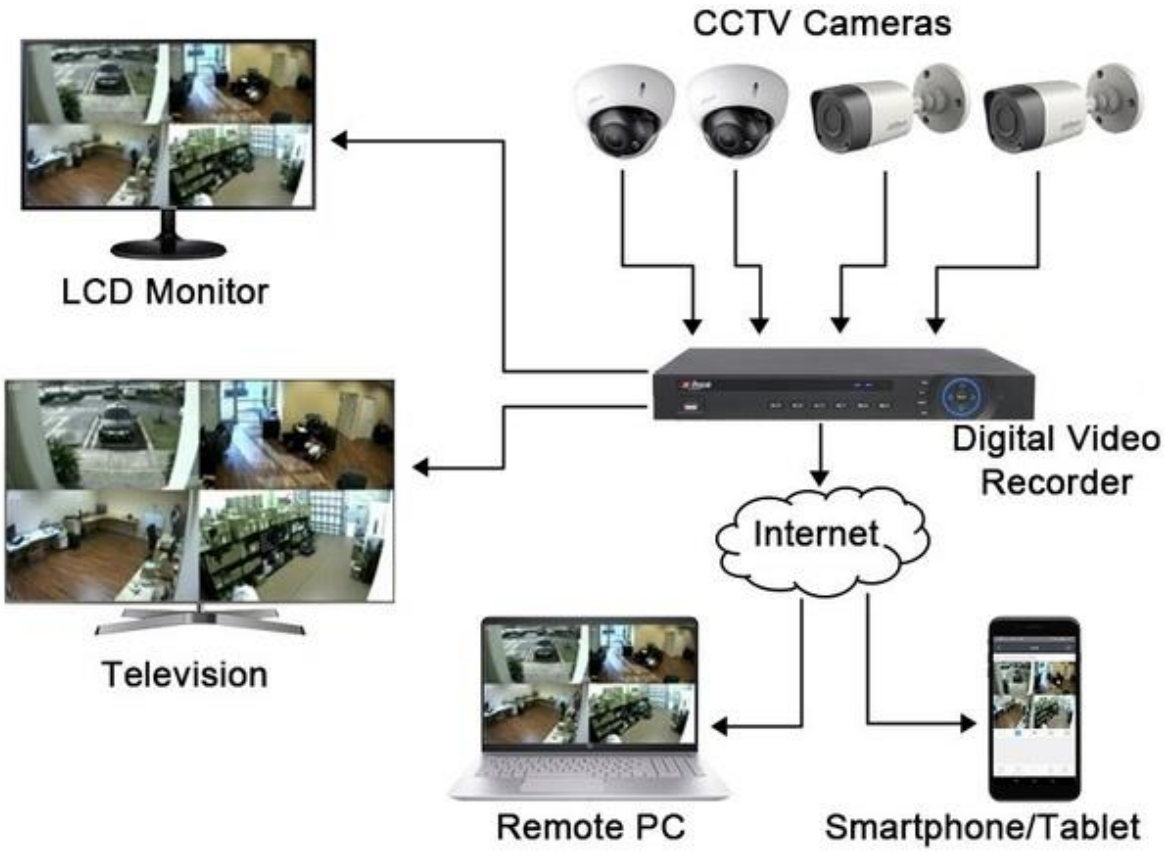

Figure 1: Overview of additional CCTV system – Plant Monitoring

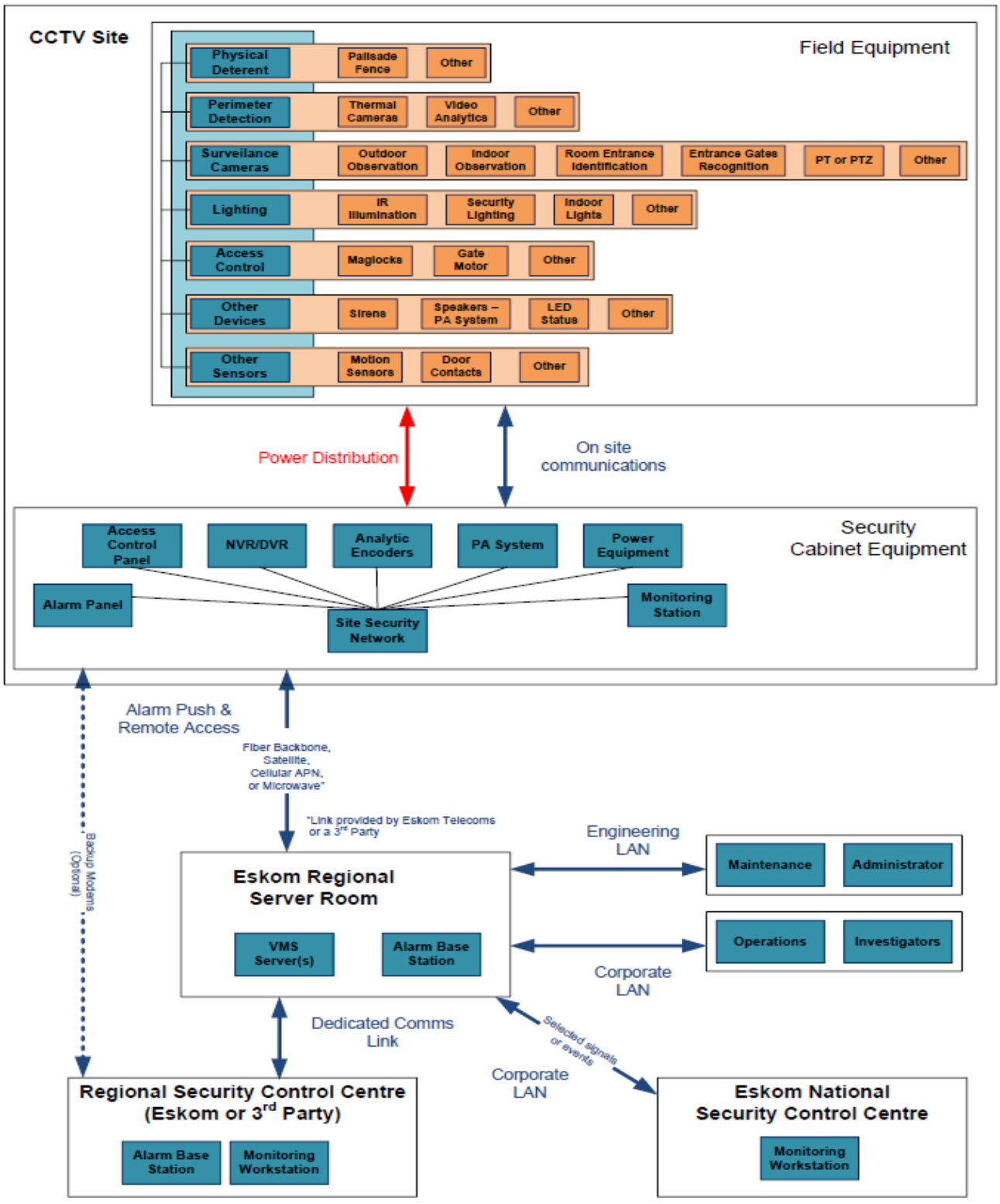

Figure 2: Functional Block Diagram of CCTV System - Security

3.1.2 External Interfaces Identification

i. The external interfaces for the monitoring system will be the remote access capabilities.
ii. The external interfaces for the security system are to the Eskom National and Reginal Security Control Centre.
iii. The designs (especially for security) shall be able to interface to the existing system (Honeywell EBI R500 and DVM R700).

3.2 REQUIRED STATES AND MODES

i. Any additions to the existing infrastructure shall not impact the current modes of operation.
ii. The system shall be available during power failures.
iii. Maintenance shall be minimal to minimise downtime.

3.3 SYSTEM FUNCTION AND PERFORMANCE REQUIREMENTS

The following formulae shall be used to evaluate the performance of CCTV and Intruder detection systems and shall be calculated monthly (adapted from DISPAVACE8).

System Availability

System Availability shall be greater than 98%

$$\boldsymbol{System\ Availability} = (\boldsymbol{Total\ hours}) / (\boldsymbol{Total\ non\ operational\ hours})\boldsymbol{Total\ Hours} \times \mathbf{100}$$

This can be calculated per site or per region.

System Reliability

Monthly System Reliability shall be greater than 95%

$$\boldsymbol{Monthly\ System\ Reliability} = \boldsymbol{Number\ of\ Faults\ in\ a\ Month} / \boldsymbol{Number\ of\ Systems\ Installed} \times \mathbf{100}$$

This can be calculated per site or per region.

System Dependability

Any single zone of the alarm / detection system shall give no more than 7 false detections in any 7-day period.

To measure this as a KPI, the following formulae below shall be used.

Monthly System Dependability shall be greater than 85%

$$\boldsymbol{Per\ Site\ System\ Dependability} = (\mathbf{1} - \boldsymbol{Number\ of\ false\ alarms\ in\ a\ month} / \mathbf{400})^2$$

This calculation is per site. Per region, the System dependability is the average of the per site values.

NOTE: This formula was chosen so as to reflect the following:

- 0 false alarms is ideal – 100% Dependable.
- 7 faults per 7 days is acceptable - 85% Dependable.
- 30 faults per 7 days indicates a poorly functioning system – 50% Dependable.
- 100 false alarms per 7 days indicates an unusable system – 0 % Dependable.

3.3.1 System Function (Monitoring)

The specific functional requirements for this type of system:

i. Observation and identification will be required from cameras that will be for monitoring purpose.

ii. The monitoring will be onsite in the plant control rooms on the operator control desks (both units and outside plant). Remote access will be for the identified personnel.

3.3.2 System Function (Security)

The specific functional requirements for this type of system:

i. Detection, observation, recognition, and identification will be required from cameras that will be for security purpose.

ii. The monitoring will be onsite in the control room (security control centre). Remote access will be as per the stated requirements in [3].

iii. The communication medium shall be interfacing to the existing security control room.

iv. The suggested zones to be covered will be as listed in Table 1.

3.4 RELATIONSHIPS BETWEEN STATES, MODES AND FUNCTIONS

N/A

3.5 SYSTEM EXTERNAL INTERFACE REQUIREMENTS

See section 3.1.2

3.5.1 Interface

The system will interface with existing systems at Kusile Power Station and may require access clearance from others.

3.6 EXTERNAL ENVIRONMENTAL REQUIREMENTS

All equipment shall be designed for application in ‘special’ environmental conditions as follows (adapted from Table 2 of IEC 60255-1):

i. Ambient air temperature: -25°C to +55°C (installed indoors); or -25°C to +70°C (installed outdoors, within enclosures).
ii. Altitude: < 2 500 m.
iii. Pollution: Location in urban areas with industrial activities and without special precautions to minimize the presence of sand or dust (conditions as per classes 3C2 and 3S2 in IEC 60721-3-3).
iv. Relative humidity (24h average): 98%.
v. All outside equipment Including fasteners and supports should be corrosion resistant and appropriate for the environment on site.
vi. After fabrication, metal surfaces including doors and removable covers shall be prepared and finished with corrosion protection.
vii. Paint work damaged during transport and delivery shall be made good as per manufacturer repair specification at no cost to Eskom. If site re-painting is necessary, the equipment and labels shall be carefully masked, and any overpaint which occurs in spite of the masking must be removed. If the damage is not repairable, Eskom reserves the right to return the equipment.

viii. All nuts, bolts and washers use for the construction to be stainless steel. Screws can be cadmium plated.
ix. Equipment installed will need added dust protection.
x. Convection cooled (fan-less) equipment are strongly preferred. If fans are used, they shall be speed controlled and the electronics shall be isolated and conformal coated to protect against dust ingress.

3.7 EXTERNAL RESOURCE UTILISATION REQUIREMENTS

i. The expected life of equipment under conditions specified Table 2 shall be a minimum of 8 to 10 years.
ii. All power cable shall be appropriately sized to ensure voltage drops along cable runs remain within the operating specifications of the equipment being powered.
iii. All equipment shall be effectively protected against overvoltage due to lighting strikes or switching surges by strategically placed surge arrestors.
iv. Descriptive cable markings shall be used as agreed to with Eskom. These shall be reflected on the drawings.
v. Cable selection and routing shall always be done in such a way that operation of equipment is not affected by electrical interference. This may be achieved by separating power and communications cables, shielding of cables, or a combination of the two.
vi. Equipment shall not be affected by electrostatic discharges that are applied directly to the equipment or to metal objects in the proximity of the equipment: All electronic equipment shall be a class 2 device as specified in IEEE 1613-2009, 8 Electrostatic discharge tests.

3.8 PHYSICAL CHARACTERISTICS REQUIREMENTS

Over and above the requirements covered in section 3.6 and 3.7 above the following additional requirements shall be catered for:

i. Cable routing.
ii. Outdoor cables and trenching (where required).
iii. Interface to security cabinets.
iv. Backup power supplies.
v. Communication.

3.9 SAFETY

The site-specific Health and Safety plan shall be accepted by an Eskom Health and Safety practitioner before any installation begins.

3.10 RELIABILITY, AVAILABILITY AND MAINTAINABILITY

The RAM for the CCTV system must involves a combination of quality components, robust design, proactive maintenance, and user-friendly interfaces. Regular monitoring, testing, and adherence to best practices in system design and operation contribute to the overall effectiveness of the CCTV system in providing continuous and reliable surveillance.

3.10.1 Reliability

The reliability of the system shall have the ability to consistently, accurately capture and record video footage without failures or disruptions.

3.10.2 Availability

The availability of the system being supplied over its life in percentage of time shall be 99.99% or greater measured annually.

3.10.3 Maintainability

The system should be designed to cater for ease and efficiency of repairs (availability of spares), upgrades and maintenance.

3.11 AFFORDABILITY

The design should try to minimise costs for construction plus running costs.

3.12 SYSTEM LIFE-EXPECTANCY

i. All equipment shall be supported and maintainable until the station's end of life.
ii. Proven technology shall be utilized.

3.13 SECURITY

The system shall be designed to protect the plant and the station from unauthorised access and cyber-attacks.

3.14 DESIGN AND CONSTRUCTION REQUIREMENTS

3.14.1 General Design and Manufacturing Process Constraints

a) Flexibility, expandability, scalability, and reusability must be provided to support future areas of growth or changes in technology and purpose:

i. **Expandability:** the capability of the intended system to be easily modified in response to potential areas of growth in requirements. Once modified, the system may require different procedures with respect to operations, maintenance, or both.

ii. **Flexibility:** the ease with which the intended system can be modified to be able to handle input variety and input volume changes, differing from those for which the system was specifically designed. An example would be anticipated changes in the quality of coal delivered to a coal-fired power-station at some future date.

iii. **Scalability:** the capability of the intended system to continue operating correctly with minimal change in current procedures as the system is enlarged to accommodate growth; and

iv. **Reusability:** the capability of the intended system to be deployed into scenarios different to the initial requirement and environment.

b) Training of personnel who will use or support the system identified by the client shall be provided.

3.14.2 Sub-System Requirements

N/A.

3.14.3 Engineering Disciplinary Requirements

Kusile Power Station engineers shall be able to connect to the Local OT Security Server remotely from the Eskom Engineering (OT) LAN to perform maintenance and administrative tasks on the system.

3.14.3.1 Civil and Structural

To be catered for in the design proposals.

3.14.3.2 Mechanical and Materials

To be catered for in the design proposals.

3.14.3.3 Chemical and Process

N/A.

3.14.3.4 Electrical

See section 3.7

3.14.3.5 Instrumentation and Control

Manual and automatic actions for system initiation and control, indicators, alarms, manual controls that are used to operate the system, required ranges and accuracies to be provided for in the designs.

3.14.3.6 Computer Hardware and Software

For any software that may require licences (if any):

i. All licenses covering the equipment, standard software and application software provided shall be provided for.
ii. All licenses shall remain valid in the event of the failure and replacement of faulty equipment.
iii. All licenses provided shall be valid for the entire life of the system being provided.
iv. All licenses shall be site licenses for use at Kusile Power Station Site.

3.14.3.7 Fire Detection and Protection

To be catered for in the design proposals.

3.14.4 Human Factors Engineering Requirements

N/A.

3.14.5 Documentation

The Contractor is responsible to plan for the supply of the documentation during the design, supply, installation, testing, commissioning and handover of the CCTV System and a document is thus any written or pictorial information describing, defining, specifying, or certifying activities, requirements, procedures and or results.

All documentation (entire architectural, equipment room layout, loop diagrams drawings, datasheets etc.) issued by the Employer for this contract is copyright protected and are not to be copied or distributed by the Contractor [8].

The Contractor shall submit all documentation on a formal transmittal form in triplicate to the Project Manager. All documents, reports and engineering documentation shall be compiled and presented in English language be in the required Microsoft Office Word, PowerPoint, Excel, PDF and or Project file extensions format.

The Contractor shall implement a legible, comprehensive, and complete documentation (control system), including their revision status and of the document status in relation to the "as designed" system status. Software licence, network architecture manuals and drawings, document control, loop diagrams, termination diagrams are included.

The drawing documentation format shall include:

Drawing number (Employer and makers number)

i. Revision.
ii. Approval status.
iii. Location of drawing at that stage.
iv. Drawing KKS number.
v. Drawing description.
vi. Sheet number.
vii. Transmittal number.

3.14.6 Packaging, Handling and Transporting Requirements

i. All the identified equipment that will be supplied as part of the scope shall be packaged such that it can be easily transported without being damaged.
ii. Dedicated areas shall be provided by Kusile Power Station for temporary storage.
iii. A detailed inventory of all equipment that is stored in the storage areas shall be provided.

3.15 OTHER REQUIREMENTS

N/A.

3.16 PRECEDENCE OF REQUIREMENTS

Shall be dealt with contractually.

3.17 VERIFICATION

The Contractor shall demonstrate that the CCTV System hardware equipment has been tested satisfactory by producing the test certificates. The contractor shall demonstrate the functionality of the system prior to the installation of the system in the production environment through a FAT. Furthermore, it is the responsibility of the Contractor to ensure that the system is tested after installation to the satisfaction of the Employer's data quality requirements with commissioning and a SAT.
The Testing environment needs to be accommodated that may be used as training once the system is deployed in production by the Contractor. As well as the production environment needs to be created for production or security. The submissions shall include the various test phases as stated in section 3.5 of [3].

3.18 NOTES

This project is of a strategic nature and covers aspects of compliance to requirements of the National Key Point. All the information and discussions will be treated in strict confidentiality and should not be shared without the consent of Eskom.

4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
Christopher Nani	Power Station General Manager
Luvuyo Feni	Technical Plant Manager
Sipho Shabangu	Risk and Assurance
Grace Olukune	Engineering Manager
Abel Vuma	Maintenance Manager
Junaid Moola	Operating Manager (Acting)
Isaac Sithole	Compliance Manager (GMR 2.1)
Siyabonga Mahaye	Outage Manager

5. REVISIONS

Date	Rev.	Compiler	Remarks
February 2024	0	Joseph Ngqendesha	First issue

5.1 PLANNED FUTURE UPDATES

To Be Determined.

6. DEVELOPMENT TEAM

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

- Tebogo Thebe
- Joseph Ngqendesha
- Puseletso Ndlovu

7. ACKNOWLEDGEMENTS

N/A

APPENDIX A: REQUIREMENTS TRACEABILITY

N/A.