



Scope of Work

Technology

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**EQUIPMENT FOR GUMENI**  
**SUBSTATION**

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## 1. General

### 1.1 Background

A second Transformer is required at Gumeni Sub Station in order to add an additional 475 MW to the available capacity base in the area.

### 1.2 Scope

The provision of a complete turnkey protection, tele-control, measurements, metering, DC and AC solution for the proposed GUMENI substation, aligned with Eskom's current methodologies in this regard.

Standard, tested and Eskom approved products are to be utilised.

The scope of works includes the

- Application design to meet the intent as stipulated in the Master drawing, and associated Standards and Specifications
- sourcing of the Eskom approved products
- supply of all material,
- delivery, off-loading, erection, installation, cabling, application of configurations and settings, commissioning; to be accepted by Eskom
- provision of documentation, as-built drawings, in Eskom standard format and to be accepted by Eskom
- anything else deemed necessary by the tenderer for the provision of a working solution

Note:

- All engineering outputs and associated intellectual property shall become the property of Eskom, and
- Roles and Responsibilities, where defined in the references in this document, are not specifically applicable for the purpose of this enquiry and any ensuing contract.

### 1.3 Station Electric Diagram

Refer to the following Station electric for GUMENI :GUM22P03-SE-C3

## 2. Protection

### 2.1 Protection scope of work

This section describes the material required for the protection scope for the proposed GUMENI 400/132 kV substation.

The scope includes all power system protection equipment and directly related infrastructure including networking equipment for the substation automation LAN, such as terminal patch panels / boxes and fibre optic cables between the bay Ethernet switches and the IEDs.

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## **2.2 Sourcing**

Eskom Transmission's current installed base of Protection, Telecommunications, Metering, (tele)Control and associated equipment (PTM&C equipment) has typically been procured through a 2-stage procurement mechanism:

- Development contract, where a supplier will develop a product to meet Eskom's requirements and the product undergoes substantial acceptance testing before being accepted by Eskom. This may be extended for periods of up to 2 years and more in certain instances;
- Supply contract, where a supplier will supply products to Eskom as developed, tested and accepted during the development contract.

Product standardisation forms the backbone of Eskom Transmission's efforts to reduce the burden associated with sustaining the infrastructure and as such the above contracting may typically be extended for periods up to 10 years. Manufacturer specific interfacing may also dictate that only specific supplier's products can be used for infrastructure extension projects to ensure compatibility with the existing installed base.

Eskom's specification and adjudication criteria for PTM&C equipment in this enquiry are based on Eskom's deemed optimal approach (time and cost) to procure / engineer accepted products that are compatible with existing infrastructure and is prescriptive only in this regard. Products other than those previously accepted, as discussed above and sourced from the Eskom approved supplier, would necessitate an extensive testing and acceptance process as well as the development of associated design base documentation to support the configuration, operation and maintenance of the products. In addition, experience has shown that constructive involvement by Eskom during development greatly accelerates the development timeframes and, as such, this has also been specified where relevant in this scope of work.

Suppliers are advised that if they have alternative technology which they may deem appropriate for the current scope of works, they are at liberty to bring this to Eskom's attention as an alternative proposal (but not an alternative tender), which will be assessed at evaluation stage. The use of technology which has not been tested and accepted by Eskom may delay the project and may have cost implications, which delays will impact the delivery timelines, and which additional costs will be for the supplier's account. No product which is proposed as an alternative technology as contemplated shall be supplied or used in respect of the works unless accepted by Eskom.

The tenderer(s) is encouraged to engage with the Eskom approved supplier to compile a detailed bill of material which shall be submitted with the proposal (tender).

## **2.3 Engineering Resources**

Resources utilised for the engineering of the protection and control solution must have previous experience developing and implementing protection and control solutions for Transmission high voltage networks.

## **2.4 EHV transformer scheme requirements and options**

The following protection and telecontrol and substation automation equipment combinations will be permitted:

- Siemens (Pty) Ltd (Eskom contract 4600067750) for the Phase VI breaker-and-a-half protection/Double Busbar equipment in combination with the Siemens (Pty) Ltd (Eskom contract 4600067750) telecontrol and substation automation equipment.

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Note that for the interface between the Protection equipment and the primary plant equipment (via JB's) is hardwire (DC supplies and tripping) and fibre that is connected to the process interface units (PIUs) that shall be located within the JB's. CT and VT interfacing with the protection & control schemes shall be hardwired.

The required protection Transformer Scheme is a 6TA-2300-M1 (DWG No 0.52/30434) and 6TA-2300-M2 (DWG No 0.52/30459)

The following levels are to be switched on for M1 and M2 Levels on 1, 2, 7, 10, 14, 15, 21, 22 & 31

Equipment as per the table below from the Eskom ENC is required to build this scheme:

Material	Siemens	
673631	Scheme: 6TA-2300-M1 Auto Transformer Protection with 1 x LoZ REF	1
673633	Scheme: 6TA-2300-M2 Auto Transformer Protection with 1 x HiZ REF	1
673522	Option - Busbar VT selection for HV (Two 7PA2341 relays)	3
673524	Option - Busbar VT selection for MV (Two 7PA2341 relays)	3
673543	Option: Legacy brownfield tap change control module for 6TA scheme	1
3000018383	Engineering: 6TA-2300 Auto Transformer Protection	2
3000018390	Engineering: Tap Changer	1
673536	Component: 6TA-#300 Mimic - Auto-Transformer	2
673542	Component: Integrated Legacy Tap Change control	1
674036	2 metre LC-LC Duplex MM 50/125 fibre optic patch cord, Non-Ruggedized	2
674037	3 metre LC-LC Duplex MM 50/125 fibre optic patch cord, Non-Ruggedized	13
674038	5 metre LC-LC Duplex MM 50/125 fibre optic patch cord, Non-Ruggedized	1
673991	Small Bay Switch: 2 x 1000BaseSx, LC; 4 x 100BaseFx, LC; 2 x 100BaseTx, RJ45 ; 19" rack; 88-300VDC Dual PS; rear ports; front display	1
673989	Large Bay Switch: 2 x 1000BaseSx, LC; 10 x 100BaseFx, LC; 2 x 100BaseTx, RJ45 ; 19" rack; 88-300VDC Dual PS; rear ports; front display	1
3000018259	Engineering - Bay Switch	2
673972	Device: Breaker PIU	4
674642	Test plugs for Breaker PIUs	4
673963	Device: Transformer PIU	2
673964	Device: Tap Change PIU	1
674646	Test plugs for Transformer PIUs	2
674649	Test plugs for Tap Change PIUs	1

A Fixed frame, rear entry panel for transformer protection schemes (2400x800x600, 19" rack mount) x 2 is required. Panels can be sourced from the Eskom approved suppliers. The Eskom approved suppliers is:

- ENC Contract number 4600071130 supplied by Wirconn

Supply, install and wiring of Transformer Breaker PIUs (Male and Female half Harting Plugs, coding pins & wiring tail) within the EHV and HV breaker 6JB9300 DWG No 0.52/30798, see 2.5 for approved suppliers

Supply, install and wiring of Transformer PIUs (Male and Female half Harting Plugs, coding pins & wiring tail) within Transformer 6JB9200 DWG No 0.52/30797, see 2.5 for approved suppliers Panel main labels – Front and Rear: will be Label size: 340 x 35 mm, Text height: 12 mm and adhere to

Labelling standard: 240-62629353 Specification for panel labelling standard.

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## **2.5 Junction Boxes**

The breaker JB's are required to provide for and interface with the equipment as per 6JB-#300 (0.52/30795 or 0.52/30798) or 6JB-#100 (0.52/30793 OR 052/30796)

The Transformer JB's are required to provide for and interface with the equipment as per 6JB-#200 (0.52/30797 or 0.52/30794), transformer and online tap changer functionality.

JB's can be sourced from the Eskom approved suppliers.

The Eskom approved suppliers are:

- ENC contract number 4600067642 supplied by Vithale Electrical CC
- ENC contract number 4600067641 supplied by Sivtek Holdings (Pty) LTD

## **2.6 400 and 132 kV Bus zone**

Interface the Transformer scheme to the existing 400 kV Bus zone protection scheme DWG No 19.08/19694

Interface the Transformer scheme to the existing 132 kV Bus zone protection scheme DWG No 19.08/19545

AC and DC shall not be in the same cable. Therefore, the CT's shall have its own cable and the Isolators shall have its own cable. The M and N auxiliary contacts shall be used for isolator indication.

The configuration of the buszone will be done by Eskom. The tenderer shall request from Eskom the configuration file 5 weeks prior factory testing.

The tenderer shall compile a factory and site commissioning test plan and shall be submitted to Eskom for review 4 weeks prior the testing activity.

The Bus zone scheme, interface with the main 1 and main 2 protection systems via copper. The cabling between the protection bays (main 1 and main 2) shall appear on the specific protection bay's cable schedule.

## **3. Fibre optic requirements**

All fibre optic cables and ODF's can be sourced from an Eskom approved supplier. See below

All work shall be done in accordance with the standards and specifications listed below:

- IEC 61073-1, Fibre optic interconnecting devices and passive components — Mechanical splices and fusion splice protectors for optical fibres and cables
- 240-46264031, Fibre-Optic Design Standard Part 2 Substations
- 240-70733995, Optical Distribution Frame / Patch Panel
- 240-60725641, Specification for standard (19 inch) equipment cabinets
- 240-70732888, Fibre optic cable system acceptance testing procedure
- 240-46263618, Labelling of fibre optic cables
- 240-722740830, Multimode Fibre Optic Duct Cable Specification
- NRS 088-1, Duct and direct-buried underground fibre-optic cable – Part 1: Product specification
- NRS 088-2, Duct and direct-buried underground fibre-optic cable – Part 2: Installation guidelines
- 240-106030205, Fibre Optic Gantry to Substation Control Room Scope of Work Guideline

Single Mode Duct Cable

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- Single mode duct cable shall adhere to NRS 088-1 and 240-46264031 and where there is a discrepancy, 240-46264031 shall take precedence.
- No armoured duct cables shall be installed.
- Between Control Rooms, single mode cable shall be installed within an HDPE pipe.
- Single mode duct cables shall be 8, 24 or 48 cores dependant on application.
- Single mode cables are installed for Teleprotection and Eskom telecommunication purposes, hence they will be installed between Joint boxes on gantry towers and the control room as well as between control rooms.
- Single mode cables for Main 1 and Main 2, from the same gantry feeder, shall follow diverse routes to the control room.
- These cables will terminate in the Fibre Optic Cabinet in the control room. The patch panel shall adhere to 240-70733995 Option A.
- The substation installation shall follow 240-46264031.

**Multimode Duct Cable**

- Multimode duct cable shall adhere to 240-722740830.
- No armoured duct cables shall be installed.
- Multimode duct cable shall be 24 cores.
- Multimode cables are installed for telecontrol purposes. Hence, they will be installed between the HV yard and the Control room.
- Multimode cables for Main 1 and Main 2 from the same Junction Box/Kiosk, in the HV Yard, shall follow diverse routes to the control room.
- These cables will terminate in the Fibre switching cabinet in the control room. The patch panel shall adhere to 240-70733995, Option B. The patch box, installed in the HV yard Protection junction box, shall adhere to 240-70733995, Option C.
- The substation installation shall follow 240-46264031.

JBs can be sourced from the Eskom approved suppliers.

The Eskom approved suppliers are:

- Fibre optic duct cables are sourced from CBi and MTEC (SA).
- Patch Panel sourced from Prysmian (SA).
- Multimode Patch Panel sourced from Instelec ENC 4600067515
- Multimode Patch Box sourced from Instelec ENC 4600067515

	<b>Multimode Fibre Optic Cables</b>	<b>Fibre Requirements for Breaker and a Half Schemes</b>
1.	Between Junction Boxes in HV yard and Control Rooms	MM Duct cable (50/125 µm) from Junction Box in HV yard to Fibre Switching Cabinet in 400kV control room. Including termination in the patch panels shall be installed in the Fibre Switching Cabinet.  Including termination in the patch boxes in the Junction Boxes.

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2.	Between Panels within the Control Room	MM Duct cable (50/125 µm) from Fibre Switching Cabinet/s to Protection/Control and Fibre Switching Cabinets according to requirements from Control (section 6).
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**Note:** All work to be done shall complete scopes of work according to 240-106030205, Fibre Optic Gantry to Substation Control Room Scope of Work Guideline. A working template can be requested from the Project Manager.

### 3.1 Telecommunication connection requirements

Existing

## 4. Protection settings

Eskom will be responsible to calculate, verify and issue of protection equipment settings. The standard Eskom settings process shall be followed. The tenderer shall be responsible for the implementation and testing of the settings.

The final schemes, IED logic designs and IED documentation, for the schemes to be developed by the tenderer (appointed contractor), shall be submitted to Eskom 8 weeks prior factory testing for compilation of the settings templates.

The request for settings shall be submitted 6 weeks and available prior factory testing.

The following standard shall be used:

- 342-242 – Protection settings management standard.
- SPF-0001 – Protection settings request form

## 5. Metering and measurements

### 5.1 Metering

The Eskom approved suppliers are:

- Sabi Switchboards Contract number: 4600071721
- Landis & Gyr Contract number: 4600070082
- Actom Contract number: 4600069855
- ADC Energy Contract number: 4600068637

### 5.2 400/132/22 kV Auto Transformer 2 metering equipment

The following equipment for 400/132 kV auto transformer 2 shall be sourced, factory tested, delivered, installed, and commissioned. Refer to 240-132226392 Application Guide for Tx Metering Commodities rev 3 for the additional meter point. Master Drawing No 0.52-30131.

### 5.3 Measurements

Measurements functions are performed by the protection control devices.

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## 6. Telecontrol and substation automation

### 6.1 400/132kV Transformer 2

Control functionality is incorporated in the protection scheme (IEC61850). M/M Fibre Optic cables will be installed from the Junction Boxes (M1 & M2) to the Protection Panels M1 & M2 and in turn from the Protection Panels M1 & M2 to the FSP 1 & 2 in the existing carrier room. Alarms will be wired to the IDF and interfaced to the D20 Panel.

Interface to Existing FSP 1 and 2 (DWG No 0.08/20399)  
Interface to Existing D400 (DWG No 0.08/20398)  
Interface to Existing D20 (DWG No 0.08/20397)  
Interface to Existing IDF (DWG No 0.08/20393)

The telecontrol and automation solution to be utilised will depend on which Eskom approved protection equipment and solution currently being used at Gumeni MTS Sub Station. The following protection, telecontrol and substation automation equipment will be permitted:

- Siemens (Pty) Ltd (Eskom development contract 4600059995) for the Phase VI breaker-and-a-half protection equipment in combination with currently installed GE D400 and D20 telecontrol and substation automation equipment.

Eskom requirements in respect of switches and routers must be applied as per the Standard Networking Devices for the Substation Environment Standard: 240-68111223 and the network architecture shall comply with the Substation Automation – Network Architecture Standard for Transmission Substations: 240-612689959

Telecontrol drawings to be created or updated are: -

- D400 Gateway
- D20 RTU
- FSP Main 1 and Main 2
- 400kV SND
- IDF Drawing

The following requirements for the protection and telecontrol and substation automation equipment shall apply:

- The contractor shall be responsible for the IEC61850 engineering and configuration of all the protection and substation automation equipment. The contractor needs to confirm that the D20 has sufficient spare capacity for the hardwire alarms required for the additional bays/requirements. This must be confirmed when presenting to Eskom DRT.
- The contractor shall be responsible for the assignment of the technical key names for IEDs as per the Eskom guide: Substation IEC61850 Physical Device Naming Structure Rev 13.
- Device IP Addresses will be allocated by Eskom PTM&C. The Contractor shall supply a completed application form on the ESKOM PTM&C standard template provided with a substation network diagram. Four weeks' notice is required following receipt of a complete IP address application form. See example below

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No.	Device Description	Physical Device Name	Substation ID	Voltage Level	Diameter/ Object ID	Bay / Scheme ID	Automation ID	IED	Device Function	Bay	Voltage	Station Voltage	Device Type	Located in Scheme	Purchase Order
<b>MAIN 1 EQUIPMENT</b>															
<b>400kV Fdr 3 Main 1 (Kusile 1)</b>															
1	Bay Ethernet Switch (M1)	AC4C1F03Y1	AC4	C1		F03		Y1	Control	C1 F03 M1	400KV	110V	RSG2100	6FZD-2110-M1	4503213101
2	Primary Protection IED (M1)	AC4C1F03A3	AC4	C1		F03		A3	Protection	C1 F03 M1	400KV	110V	7SL87	6FZD-2110-M1	4503213101
3	Breaker PIU (M1)	AC4C1F03A1	AC4	C1		F03		A1	Protection	C1 F03 M1	400KV	110V	6MD85	6JB-8100	4503213101
<b>MAIN 2 EQUIPMENT</b>															
<b>400kV Fdr 3 Main 2 (Kusile 1)</b>															
1	Bay Ethernet Switch (M2)	AC4C1F03Y2	AC4	C1		F03		Y2	Control	C1 F03 M2	400KV	110V	RSG2100	6FZD-2110-M2	4503213101
2	Primary Protection IED (M2)	AC4C1F03A4	AC4	C1		F03		A4	Protection	C1 F03 M2	400KV	110V	7SL87	6FZD-2110-M2	4503213101
3	Breaker PIU (M2)	AC4C1F03A2	AC4	C1		F03		A2	Protection	C1 F03 M2	400KV	110V	6MD85	6JB-8100	4503213101
<b>D400</b>															
1	Gateway Switch	AC4C1 G1G11	AC4	C1		G1	G1	1	Control	GW2 M1	-	110V	RSG2100		4503213101

- The contractor shall produce a substation network diagram inclusive of technical key names for all IEDs that require an IP address. Refer to Vulcan SND as a example DWG No : 0.08/21170
- The contractor shall produce the signal lists for each of the protection schemes and station IEDs to be used for the ESKOM database. These signal lists must be provided to Eskom PTM&C at least 12 weeks prior to the commencement of cold commissioning of the SCADA. The format is SCD (Substation Configuration Description) or CID (Configured IED Description)
- The contractor shall provide the final Protection IED configuration file 12 weeks prior to Scada Commissioning
  - Eskom shall be responsible for the upgrading of the currently installed D400 firmware from Version 2.75 to Version 5.7. Converting the current D400 configuration to the new DSAS version format.
  - Eskom shall be responsible for the addition of the new Phase VI Protection Scheme (IEC 61850) to the converted D400 configuration and iHMI.
  - Scheme hardwired alarms will be wired to the IDF and interfaced to the D20 RTU. Eskom will be responsible for the addition of these alarms to the D20 configuration.
  - Eskom shall be responsible for the configuration updates of all the existing switches
  - The IEC60870-5-101 signal database for National Control, Standby National Control and Regional Control Centres shall be created by Eskom PTM&C.

## 6.2 Telecontrol and substation automation equipment

The telecontrol and substation automation equipment currently installed at Gumeni MTS Substation is the GE D400 Gateway and D20 RTU. Should any additional equipment be required the contractor can source this equipment from Integrators of Systems Technology (Pty) Ltd (iST)

## 7. Auxiliary supplies (AC & DC systems)

### 7.1 DC systems

- The existing 220 DC board is to be interfaced with DWG No 19.08/19699

### 7.2 AC systems

- The existing AC Board is to be interfaced with, DWG No : 19.08/19652.

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- A new Type 1 TDB is to be ordered DWG No: 0.52-20252
- TDB ENC number is 4600059969
- Supplier can be MEC Technology (Pty) Ltd

Refer too

- AC Reticulation philosophy for substations: 240-55151946.
- Supply, Install and commission Type 1 Transformer Distribution Boards (0.52/20252);

## **8. Teleprotection**

- N/A.

## **9. Protection application design**

### **9.1 Protection application design requirements**

The protection application design, interface between the Eskom standard protection schemes and the primary plant and secondary plant equipment, shall be the responsibility of the tenderer. The standard Eskom scheme design diagrams, which include applications levels and the interface requirements to the primary plant equipment and the substation control/relay room equipment, shall be used. No changes to the standard scheme design are permitted, the application design focus only on the interface between the primary plant and the standard protection schemes and equipment. Eskom will supply drawing numbers. The integration, cabling, and wiring of all the Transmission PTM&C equipment within the GUMENI relay room shall be within the tenderer's scope of supply. The final set of application design for construction shall be made available prior to energisation of the primary plant for Settings purposes. The stringing, cabling, earthing and erection specification for transmission substations – 240-82736997 shall be adhere to. The installation of cables and cable racking shall be in strict accordance with the law, SABS codes of practice and standards. The tenderer shall provide all the secondary plant package including but not limited to, application drawings, primary plant equipment, BOM etc. during the project hand over phase. The tenderer shall submit the application drawings 'As Built' after final commissioning as revision 0 to be registered by the Eskom CAD Office. Existing interface T drawings shall be revised to the next number

The following standard shall be used:

- 240-68980568 – Standard for the Application of Transmission and Distribution Protection Schemes; and,
- 240-96632721 Secondary Plant Drawing Practice Standard for Transmission and Distribution

### **9.2 Control room layout**

Contractor to mark Up 400 kV control room Dwg No :19.08/19695. Control room layout shall be accepted by Eskom before construction.

## **10. Protection settings**

Eskom will be responsible to calculate, verify and issue of protection equipment settings. The standard Eskom settings process shall be followed. The tenderer shall be responsible for the implementation and testing of the settings.

The request for settings shall be submitted 6 weeks before they are required.

The following standard shall be used:

- 342-242 – Protection settings management standard.

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- SPF-0001 – Protection settings request form

## **11. Commissioning**

The assets shall be commissioned to Eskom's standards and specifications. This is intended to protect the safety, integrity, and security of the Transmission system.

The pre-commissioning and commissioning activities shall be the responsibility of the tenderer (appointed contractor), and shall be witnessed and the results verified, accepted, and approved by the Eskom Transmission representative(s). The tenderer (appointed contractor) shall utilise the Eskom approved pre-commissioning and commissioning procedures and shall compile the required documentation for handover purposes prior energisation.

The tenderer (appointed contractor) shall submit to Eskom, the pre-commissioning and commissioning test plans and program, which shall comply with the Eskom requirements, for approval.

Eskom Transmission has test routines for most of the protection IEDs and these shall be obtained from Eskom and shall be used by the tenderer (appointed contractor) during commissioning, where applicable. Test routines that are not available for IEDs within the schemes that will be designed by the appointed contractor shall be developed by the tenderer (appointed contractor).

The following standard shall be used:

- 240-54615413 – Standard for Commissioning Protection Assets.
- 240-55197966 – Standard for the commissioning of metering installations (HV and MV).
- 240-137465740 – Standby Battery storage and commissioning in Eskom

## **12. General**

The following shall be presented to Eskom PTM&C DRT for acceptance,

- Station Network Diagram (Technical keys and IP address to be included)
- Bill of Materials for all disciplines
- Control Room/Carrier Room layout

These designs are to be accepted by Eskom prior proceeding to the next stage. Acceptance of designs by Eskom does not relieve the contractor of their accountability for the design

- All work shall comply with (as required)
  - 240-64636794 – Generic Equipment Specification Wire, Wire Marking, Cable Numbering, Fibre Optical Cable Installation and Labelling
  - 240-62629353 – Labelling
  - 240-64100247 – Earthing
  - 240-96632721 – Eskom Drawings
  - 240-132496539 – JB specs
  - 240-60725641 – Panel spec
  - 240-82736997 – The stringing, cabling, earthing and erection specification for transmission substations
- The installation of cables and cable racking shall be in strict accordance with the law, SABS codes of practice and standards, any deviations to be approved by Eskom.
- Eskom will supply drawing numbers. The tender shall request drawing numbers from Eskom.

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- The tenderer shall be given all the scheme drawings accompanied with the relevant application & drawing standards.
- Eskom will review the application drawings before the construction phase of the project commences. A title block for a Eskom representative to sign on the first page of every application needs to be shown on all applications
- The tenderer shall provide all the PTM&C plant package including but not limited to application drawings, primary plant equipment, BOM etc. during the project handing over phase.
- All "As built" drawings shall be submitted to Eskom as revision 0.
- Eskom's Systems Operator requires minimum six weeks' notice to provide protection settings. Finalised scheme application drawings and CT and VT specification data shall be provided to the System Operator together with the request for settings. Protection CT ratio selection shall be done in consultation with the System Operator.

### 13. Specifications to be complied to

- [1] 240-54615413 - Standard for Commissioning Protection Assets
- [2] 240-64139144 AC Boards and Junction Boxes for Substations
- [3] 240-132496539 Yard Digital Interface Junction Boxes for Transmission
- [4] 240-46263618 Labelling of Fibre-Optic Cables Standard
- [5] 240-68980568 – Standard for the Application of Transmission and Distribution Protection Schemes
- [6] 240-96632721 Secondary Plant Drawing Practice Standard for Transmission and Distribution
- [7] 240-60725641 Specification for Standard (19 Inch) Equipment Cabinets rev4
- [8] 240-67712833 Specification for Transmission and Distribution Protection Schemes- Transformers and Reactors
- [9] 240-64100247 Standard for earthing of secondary plant equipment in sub stations rev2
- [10] 240-64636794 Standard for Wiring and Cable Marking in Substation
- [11] 240-132226392 Application Guidelines for Transmission Metering Commodities
- [12] 240-52840736 Standard for three phase programmable energy meters\_rev3
- [13] 240-61268959 Substation Automation - Network Architecture and Application Design Standard for Transmission Substations
- [14] 240-70412803 Interlocking Guideline for Eskom HV Yard SCADA HMI Equipment
- [15] 240-170000395 - Substation Control and Automation Application Guide for Phase 6 Siemens Solution

### 14. Revision and tracking

Rev No	Description	Compiler	Date
1	Initial Scope of Work	Clive Watson	2023/06/12

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