

 <b>Eskom</b>	<b>Report</b>	<b>Project Engineering</b>
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Title: **TECHNICAL EVALUATION CRITERIA FOR THE PTM&C EQUIPMENT & COMMISSIONING ASSOCIATED WITH UPINGTON AND FERRUM SUBSTATIONS** Unique Identifier: **240-171000110**  
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## **1. Introduction**

This document provides an overview of Eskom's technical evaluation strategy and criteria to be used when evaluating the tender submissions for:

- a. Supply of Phase V (BAH) and Phase VI protection schemes for feeders; junction boxes; teleprotection and disturbance fault recorder equipment as listed in Table 2 and detailed in 240-171000113 High Level Scope of Work – PTM&C Equipment for Upington and Ferrum Substations.
- b. Commissioning of Phase V (BAH) and Phase VI protection schemes for feeders; junction boxes; teleprotection and disturbance fault recorder equipment as listed in Table 2 and detailed in 240-171000113 High Level Scope of Work – PTM&C Equipment for Upington and Ferrum Substations.

## **2. Supporting clause.**

### **2.1 Scope**

This document contains the technical evaluation strategy and criteria relating to the:

- a. Supply of Phase V (BAH) and Phase VI protection schemes for feeders; junction boxes; teleprotection and disturbance fault recorder equipment as listed in Table 2 and detailed in 240-171000113 High Level Scope of Work – PTM&C Equipment for Upington and Ferrum Substations.
- b. Commissioning of Phase V (BAH) and Phase VI protection schemes for feeders; junction boxes; teleprotection and disturbance fault recorder equipment as listed in Table 2 and detailed in 240-171000113 High Level Scope of Work – PTM&C Equipment for Upington and Ferrum Substations.

and details specific tender returnables required to facilitate this evaluation.

#### **2.1.1 Purpose**

The purpose of this document is to define the technical evaluation strategy and criteria and detail specific tender returnables required to facilitate this evaluation.

#### **2.1.2 Applicability**

This document shall apply to Eskom Transmission Division.

## **2.2 Normative/informative references**

Parties using this document shall apply:

### **2.2.1 Normative**

Note: Certain documents listed below may state applicability to Eskom Distribution, however those documents are also applicable to Eskom Transmission.

- [1] Drawing No: 0.52/30268 – Master Drawing for 5FZB-3100
- [2] Drawing No: 0.52/30274 – Master Drawing for 5DIP-3100
- [3] Drawing No: 0.52/30367 – Master Drawing for 5DIP-3210
- [4] Drawing No: 0.52/20249 – Master Drawings for 1JB-0333
- [5] Drawing No: 0.54/6731 – Master Drawings for 1JB-0700
- [6] Drawing No: 0.52/30555 and 0.52/30556 – Master Drawings for 6FZD-2110
- [7] Drawing No: 0.52/30793 or 0.52/30796 – Master Drawings for 6JB-#100
- [8] Drawing No: 0.52/1186 – Master Drawing for 1JB-0602

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- [9] Drawing No: 0.52/20251 – Master Drawing for 1PB-0100
- [10] Drawing No: 0.52/30112 – Master Drawings for 6DR-7100
- [11] Drawing No: 0.52/30110 – Master Drawings for Teleprotection (PLC)
- [12] 240-60725641: Specification for Standard (19 inch) Equipment Cabinets
- [13] 240-70733995: Optical Distribution Frame / Patch Panel
- [14] 240-171000113: High Level Scope of Work – PTM&C Equipment for Upington and Ferrum Substations
- [15] 240-54615413: Standard for Commissioning Protection Assets
- [16] 240-11329030: Western Grid In and Out Commissioning Sheets
- [17] TCP 41-141: Inspection Sheets for Substation Equipment to be Taken Over by the Asset Owner
- [18] 240-180000670 EPC Equipment and Commissioning Template

## 2.2.2 Informative

- [19] 240-60665215 – Delivery projects commissioning management procedure

## 2.3 Definitions

### 2.3.1 General

Definition	Description
<b>Breaker and a half</b>	The breaker and a half bus arrangement consist of two main busbars, each normally energised. Between each of the main busbars are similar arranged “bays” of three circuit breakers configured such that the two lines or a combination transmission line and transformer position share the centre circuit breaker.
<b>Double Busbar</b>	A substation layout consisting of the conventional double busbar configuration with or without bus section / bus couplers etc. A set of isolator links per busbar are used to connect the transformer bay to either busbar. In double bus bar system two identical bus bars are used in such a way that any outgoing or incoming feeder can be taken from any of the bus.
<b>Extra High Voltage</b>	Nominal AC voltages above 220kV up to and including 765kV.
<b>Intelligent Electronic Device</b>	A microprocessor-based device that encompasses all or some of the following functionalities: protection, control and automation, metering, tele control, substation DC and auxiliary supply systems, quality of supply monitoring, and disturbance and event recording.

### 2.3.2 Disclosure classification

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

## 2.4 Abbreviations

Abbreviation	Description
<b>DFR</b>	Disturbance Fault Recorder
<b>DIP</b>	Diameter Interface Panel
<b>EHV</b>	Extra High Voltage
<b>FZB</b>	Breaker and a Half Feeder Impedance

Abbreviation	Description
JB	Junction Box
kV	Kilovolt
PTM&C	Protection Telecommunication Measurements & Control
TET	Technical Evaluation Team
TWS	Travelling Wave System

## 2.5 Roles and responsibilities

It is proposed that:

- Eskom shall utilise this document as the basis for the technical evaluation process.
- Tenderers shall note the evaluation criteria and required tender returnables as laid out in this document and submit proposals in compliance to the stipulated requirements.

## 2.6 Process for monitoring

Not applicable.

## 2.7 Related/supporting documents

Not applicable.

## 3. Technical Tender Evaluation Procedure

The evaluation process has three stages, with corresponding minimum scoring thresholds per stage required for a bid to be deemed compliant:

- a) **Stage 1:** Technical Qualitative Requirements for the Supply of Equipment which require a minimum of 80% compliance. Only submissions that pass the scoring threshold of a minimum of 80% will proceed to the next stage.
- b) **Stage 2:** Technical Qualitative Requirements for Installation, Testing & Commissioning which require a minimum of 80% compliance threshold. Only submissions that pass the scoring threshold of a minimum of 80% will proceed to the next stage.
- c) **Stage 3:** Deemed offer Risks which should at least be acceptable with a minimum threshold of 80%.

The technical evaluation process will follow a chronological order:

- 1) Stage 1 evaluates the technical criteria for the Supply of Equipment and will be scored against the thresholds defined. If the Stage 1 threshold is met, then the qualifying bid will proceed to Stage 2. If the bidder fails to achieve the defined threshold, then the submission is deemed to be non-compliant and will not be considered for further evaluation. Based on the evaluation, qualifying offers with any non-compliances which Eskom deems necessary, may be recommended for negotiation as compulsory prior to contract award.
- 2) Stage 2 evaluates the technical criteria for Installation, Testing & Commissioning and will be scored against the thresholds defined. If the Stage 2 thresholds are met, then the qualifying bids will proceed to Stage 3. If the bidder fails to achieve the defined threshold, then the submission is deemed to be non-compliant and will be removed from further evaluation. Based on the evaluation, qualifying offers with any non-compliances which Eskom deems necessary, may be recommended for negotiation as compulsory prior to contract award.

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- 3) Stage 3 is a report written by the evaluation team to determine and motivate whether any risks found throughout the evaluation are deemed low / acceptable / high and will serve as input to the recommendation as to whether the offer should be accepted.

The detailed methodologies for scoring in each stage are provided in Sections 4 to 6.

#### **4. Stage 1: Evaluation of Technical Qualitative Requirements for the Supply of Equipment**

This section contains the technical evaluation strategy and criteria for the supply as stipulated in the 240-171000113 High Level Scope of Work – PTM&C Equipment for Upington and Ferrum Substations.

The following criteria will be used to assess the tenderer's technical acceptability pursuant to a contract with Eskom with respect to the supply of specific products to meet Eskom's requirements.

Each item will be assigned a score by the Eskom evaluation team, based upon the tendered response, using Table 1 to score those items in Schedule B of the A&B Technical Schedule in Annexure A.

Tender responses claiming compliance to an item (e.g., 'Comply') but which are found to be non-compliant during verification will be assigned the corresponding score by the Eskom evaluation team. Items for which compliance is not claimed (e.g., 'Do Not Comply'), but which are found to be compliant during verification will be scored as 'non-compliant' based on the original response.

All scores for the Technical Schedules A&B will be tallied and shall be calculated based on the maximum possible score (Score from Table 1). This value will be recorded as the equivalent amount out of a score of 100% in Table 2. There is a minimum score threshold of 80% to pass this stage.

Annexure A: A&B Technical Schedule and Annexure J: Deviation Schedule shall be completed, signed and submitted as a tender returnable.

**Table 1: Scoring of Items in Technical Schedules A&B**

Criteria	Score
Fully compliant	1
Non-compliant (major deviation)	0

**Table 2: Technical Qualitative Requirements Evaluation**

No.	Item	Score (1/0)	Comments
1.	Full compliance to Drawing No: 0.52/30268 & 240-60725641, in respect of equipment supplied and wiring.		
2.	Full compliance to Drawing No: 0.52/30274 & 240-60725641, in respect of equipment supplied and wiring.		
3.	Full compliance to Drawing No: 0.52/30367 & 240-60725641, in respect of equipment supplied and wiring.		
4.	Full compliance to Drawing No: 0.52/20249, in respect of equipment supplied and wiring.		

No.	Item	Score (1/0)	Comments
5.	Full compliance to Drawing No: 0.52/30555 and 0.52/30556 & 240-60725641, in respect of equipment supplied and wiring.		
6.	Full compliance to Drawing No: 0.52/30793 or 0.52/30796, in respect of equipment supplied and wiring.		
7.	Full compliance to Drawing No: 0.52/30112, in respect of equipment supplied and wiring.		
8.	Full compliance to Drawing No: 0.54/6731, in respect of equipment supplied and wiring.		
9.	Full compliance to Drawing No: 0.52/1186, in respect of equipment supplied and wiring.		
10.	Full compliance to Drawing No: 0.52/20251, in respect of equipment supplied and wiring.		
11.	Full compliance to Drawing No: 0.52/30268, sheet number 10 & refer to 240-171000113, Section 5 in respect of equipment supplied and wiring.		
12.	Full compliance to Drawing No: 0.52/30555, sheet number 14 & refer to 240-171000113, Section 5 in respect of equipment supplied and wiring.		
13.	Full compliance to Drawing No: 0.52/30110 & refer to 240-171000113, Section 5 & Annexure B in respect of equipment supplied, wiring and frequency.		
14.	Full compliance to 240-171000113, Section 6 (Patch Panels/Boxes) in respect of equipment supplied and wiring.		
15.	Full compliance to other equipment, refer to 240-171000113, Annexure F in respect of equipment supplied and wiring.		
Total Score %			<b>Threshold = 80%</b>

Tenderers that do not achieve at least the **threshold** for this stage will not be evaluated further for consideration in terms of this Request For Proposal.

## 5. Stage 2: Evaluation of Technical Qualitative Requirements for Installation, Testing & Commissioning Capability

This section contains the technical evaluation strategy and criteria for evaluating submissions to perform installation, testing and commissioning of the equipment listed in Table 2 at Eskom substations.

The following criteria will be used to assess the tenderer's technical capability to enter into a contract with Eskom with respect to installation, testing and commissioning work. The assessment is based on the returnables requested in:

1. Annexure B: Engineering Schedule (To be excluded / Not applicable)
2. Annexure C: Procedure for Commissioning
3. Annexure D: Schedule for Commissioning
4. Annexure E: Tool List
5. Annexure F: Test Equipment List
6. Annexure G: Software List
7. Annexure H: Training Courses per technician
8. Annexure I: Organogram, CV's & Project Experience
9. Annexure J: Deviation Schedule

Each item will be assigned a score by the Eskom evaluation team using Table 3. The score for each item will be multiplied by its weight to obtain the total score per item.

**Table 3: Scoring for Contractor Commissioning**

Score	Description
10	Deemed to fully meet requirements
7	Deemed to mostly meet requirements
2	Deemed as substantially not meeting requirements
0	Nonresponsive
Note: Scores will be allocated in the range 0 - 10 with the above as a guideline	

The quality criteria will be adjudicated as a weighted score out of 100% and will comprise of scoring in the categories as defined in Table 4. Each category has a minimum threshold score of 80%.

**Table 4: Installation, Testing & Commissioning Capability Criteria**

Category	Item	Threshold Score	Score	Sub-Weight	Weighting
1.	Engineering	0%	(%)		0%
2.	Procedure for Commissioning	>80%	(%)		30%
3.	Schedule for Commissioning	>80%	(%)		20%
3.1	Tools, Test Equipment, Software	>80%	(%)	30%	50%
3.2	Training Courses	>80%	(%)	10%	
3.3	Related Experience and references	>80%	(%)	60%	
	Score		(%)		100%



## 6. Stage 3: Deemed Offer Risk(s)

Eskom's evaluation team shall compile a report summarising risks associated with any aspect of the offer:

- a) noted during the Technical Qualitative Requirements for the Supply of Equipment,
- b) noted during the Technical Qualitative Requirements for Installation, Testing & Commissioning.
- c) based on any pricing anomalies, noted during the subsequent financial evaluation that cannot be acceptably clarified.
- d) Noted on the deviation schedule as in Annexure J: Deviation Schedule.

This narrative shall be used to determine and motivate whether the risk is deemed high / acceptable / low and will serve as input to the recommendation as to whether the offer should be accepted as shown in Table 5.

Note, the TET shall only have access to financial information post completion of the technical evaluation report. Any changes as a result of c) above will be included in an update to the initial report. Deemed offer Risk(s) shall be assessed as per Table 6.

**Table 5: Deemed Offer Risk(s) Evaluation**

Criteria	Score	Comments
Deemed Offer Risk(s)		
<b>Threshold</b>	<b>80%</b>	<b>Accepted</b>

**Table 6: Scoring guide for Deemed offer Risk(s)**

Score	Description
91% – 100%	Deemed low risk
80% – 90 %	Deemed acceptable risk
≤ 79%	Deemed high risk
Note: Deemed offer Risk(s) will be assessed, as per section 6, with Table 6 as a guideline, and Table 5 as the threshold for this stage.	

## 7. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Mario Petersen	PTM&C Planning and Project Support Manager (Acting)
Judith Malinga	PTM&C Engineering Senior Manager

## 8. Revision History

Date	Rev	Compiler	Remarks
Apr 2023	1	L. Nogela	First issue
Dec 2023	2	L. Nogela	The template was updated.

## 9. Acknowledgements

N/A

## Annexure A: A&B Technical Schedule

This Annexure must be completed, signed and submitted.

Schedule A: Purchasers specific requirements. Each of these requirements are equally weighted.

Schedule B: Tenders to stipulate “**Comply**” or “**Do not Comply**”. All equipment supplied must be identical to the master drawings and wired identically in order to respond “**Comply**”.

No.	Requirements	Description	Schedule A	Schedule B	Comments
1.	Full compliance to Drawing No: 0.52/30268, in respect of equipment supplied and wiring.	Master Drawing for 5FZB-3100.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment. If a newer IED version is supplied for a scheme, then a configuration file with identical functionality must be supplied by the tenderer.	Comply		
2.	Full compliance to Drawing No: 0.52/30274, in respect of equipment supplied and wiring.	Master Drawing for 5DIP-3100.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment. If a newer IED version is supplied for a scheme, then a configuration file with identical functionality must be supplied by the tenderer.	Comply		
3.	Full compliance to Drawing No: 0.52/30367, in respect of equipment supplied and wiring.	Master Drawing for 5DIP-3210.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment. If a newer IED version is supplied for a scheme, then a configuration file with identical functionality must be supplied by the tenderer.	Comply		

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No.	Requirements	Description	Schedule A	Schedule B	Comments
4.	Full compliance to Drawing No: 0.52/20249, in respect of equipment supplied and wiring.	Master Drawings for 1JB-0333  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		
5.	Full compliance to Drawing No: 0.54/6731 and 0.52/1186, in respect of equipment supplied and wiring.	Master Drawings for 1JB-0700 and 1JB-0602.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		
6.	Full compliance to Drawing No: 0.52/30555 and 0.52/30556, in respect of equipment supplied and wiring.	Master Drawings for 6FZD-2110.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment. If a newer IED version is supplied for a scheme, then a configuration file with identical functionality must be supplied by the tenderer.	Comply		
7.	Full compliance to Drawing No: 0.52/30793 or 0.52/30796, in respect of equipment supplied and wiring.	Master Drawing for 6JB-#100.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment. If a newer IED version is supplied for a scheme, then a configuration file with identical functionality must be supplied by the tenderer.	Comply		

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No.	Requirements	Description	Schedule A	Schedule B	Comments
8.	Full compliance to Drawing No: 0.52/20251, in respect of equipment supplied and wiring.	Master Drawing for 1PB-0100.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		
9.	Full compliance to Drawing No: 0.52/30112, in respect of equipment supplied and wiring.	Master Drawings for 6DR-7100  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment. If a newer IED version is supplied for a scheme, then a configuration file with identical functionality must be supplied by the tenderer.	Comply		
10.	Full compliance to Drawing No: 0.52/30268, sheet number 10, in respect of equipment supplied and wiring.	NSD570 – Refer to Sheet 10  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		
11.	Full compliance to Drawing No: 0.52/30555, sheet number 14 in respect of equipment supplied and wiring.	NSD570 – Refer to Sheet 14  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		

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No.	Requirements	Description	Schedule A	Schedule B	Comments
12.	Full compliance to Drawing No: 0.52/30110 & refer to 240-171000113, Section 5 & Annexure B in respect of equipment supplied, wiring and frequency.	Power Line Carrier Link – Refer to 240-171000113, Annexure B.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		
13.	Full compliance to 240-171000113, Section 6 in respect of equipment supplied and wiring.	Patch Panels/Boxes – Refer to 240-171000113, Annexure D & E  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		
14.	Full compliance to other equipment, refer to 240-171000113, Annexure F in respect of equipment supplied and wiring.	Other Equipment – Refer to 240-171000113, Annexure F.  Note: Where component obsolesce or other reasons predicate changes to the existing design, <i>Suppliers</i> shall propose alternatives, while minimising impact to the existing design, for acceptance by <i>Purchaser</i> at the <i>Purchaser's</i> discretion prior to delivery of the equipment.	Comply		

Signed by: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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## Annexure B: Engineering Schedule

This Annexure must be completed, signed and submitted.

Tenderers are to supply a method statement indicating the approach and deliverables for the engineering of the proposed scope.

Schedule A: Purchasers specific requirements. Each of these requirements are equally weighted.

Schedule B: Tenders to stipulate “**Comply**” or “**Do not Comply**”.

No.	Requirements	Comment	Schedule A	Schedule B	Comments
1.	Compliance to 240-68980568 – Standard for the Application of Transmission and Distribution Protection Schemes;	Application Engineering should comply to Eskom’s standard approach to application engineering to ensure a consistent look and feel across Transmission installed infrastructure to facilitate operations and maintenance, and to facilitate lifecycle management and possible future expansion of the infrastructure.	Comply		
2.	Compliance to 240-96632721 Secondary Plant Drawing Practice Standard for Transmission and Distribution	Drawings should comply to Eskom’s standard approach to ensure a consistent format across all drawings.	Comply		
3.	Control layout drawing as per existing drawing no *.**/*****	Additional equipment in terms of this scope to be added to the existing control room layout.	Comply		
4.	Compliance to 240-170000395 - Substation Control and Automation Application Guide for Phase 6 Siemens Solution	Application Engineering should comply to Eskom’s standard approach to application engineering to ensure a consistent look and feel across Transmission installed infrastructure to facilitate operations and maintenance, and to facilitate lifecycle management and possible future expansion of the infrastructure.	Comply		

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**Document Classification: Controlled Disclosure**

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**Signed by:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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## Annexure D: Schedule for Commissioning

Tenders are required to propose a schedule for commissioning (task sequencing and duration) incorporating the procedure(s) developed in Annexure C, in compliance with the Scope of Work 240-171000113; whilst considering and ensuring the continuity of existing operations. This schedule will be scored against Table 3. The schedule for commissioning refers to a list of activities and the order in which the activities will be performed, with corresponding timelines. Use as many pages as required to provide details.

Activity Name	Activity Description	Start Date	End Date

Signed: \_\_\_\_\_ (Company Rep)      Date: \_\_\_\_\_

Rep Name: \_\_\_\_\_

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**Annexure E: Tool List**

Please, complete this annexure, and submit it with the tender document. Examples are provided below; however, this is not an exhaustive list. Ensure that you list all relevant tools required for the project.

Tools to be used for construction	Description	Requirement (e.g. per person / per team / per section)	Indicate if owned(O) or to be hired(H)**
Technicians Toolbox	Pliers, side cutters, insulated screw drivers, strippers, etc	Per Team	
JST insulated lug crimper	Crimper for crimping reinsulated lugs – quality of crimp connection to be certified per tool.	Per Team	
Hand-held radio set	Hand-held radio set	Per Team	
Anti-static wrist strap	3 m	Per technician	
Test Leads	2.5mm <sup>2</sup> with a minimum of 20 leads with a 3m length	Per Team	
Universal panel key	To Open Panels	Per Team	
Crimper	(Red, Blue and Yellow lugs)	Per Team	
Crimper	(eg. Suhner: RF Connectors, with jaws for LMR 400, LMR 195, RG213)	Per Team	
Test handles	Test block PK2 - 4 way	2 per technician	
Test handles	Test block PK2 - 6 way	1 per technician	
Metering Seals	Traceable Plastic/Wire and Ferrule seals for sealing meters and test blocks	Per technician	
1000V rated Torque wrench	Gedore 8 to 54 Nm - with insulated sockets (8,10,13,17,19)	Per Team	

**\*\*When tools would be hired, a hiring letter from the reputable hiring agency is required**

**DECLARATION:** I hereby confirm that the tools list above is a true reflection of the tools owned or hired by my Company.

I will also ensure that all tools will be enough to cater for multiple full teams and tools that require calibration will have valid calibration certificates before the execution of work.

**Signed:** \_\_\_\_\_ (Company Rep)

**Date:** \_\_\_\_\_

**Rep Name:** \_\_\_\_\_

**Tendering Company:** \_\_\_\_\_

**Annexure F: Test Equipment List**

Please, complete this annexure, and submit it with the tender document. Examples are provided below; however, this is not an exhaustive list. Ensure that you list all relevant test equipment required for the project.

Test equipment to be used for construction	Description	Requirement (e.g. per person / per team / per section)	Valid test / calibration certificate no.	Serial no.	Indicate if owned(O) or to be hired(H)**
AC Current clamp: 0-5A	Accuracy +/- 2% of reading, safety CAT III 600V, 10mm jaw inner diameter (max)	Per team			
AC Current clamp: 0-1000A	Accuracy +/- 2% of reading, safety CAT III 600V, 55mm jaw inner diameter (min)	Per team			
Digital multi-meter	4 ½ Digit true RMS as per DSP 34-1053	Per technician			
Insulation tester 500V		Per team			
Insulation tester 5kV		Per site			
Laptop with 3G capability	Suitable Laptop dependant on software requirements.	Per technician			
Relay communication cables	All relevant cables for the service area	Per technician			
IEC61850 Test Tools		Per Site			
Secondary Injection test set including all required test leads	e.g., suitably calibrated Omicron 356 or 256, or equivalent. GPS Time synchronisation required for feeder commissioning.	Per team			

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Primary Injection test set including all required test leads, including portable test leads to connect to primary conductor.	e.g., suitably calibrated CPC 100 or equivalent with sufficient test leads.	Per team			
Current Transformer test set including all required test leads.	e.g., suitably, suitably calibrated CT Analyser or equivalent with sufficient test leads.	Per site			
Voltage Transformer test set including all required test leads.	e.g., suitably calibrated Voltano or equivalent with sufficient test leads.	Per site			
Meter accuracy verification test unit	Metes320 test unit /MTE or similar. Including: 3X Clip-on current sensors with 1A & 5A ranges	Per team			
Optical eye	Universal type for meter programming	Per technician			
Polarity tester		Per team			
Discharge Unit	Torqual 860	Per Team			
Digital hydrometer	Anton Paar	Per Team			
TMC2001D	Voltage Unit	Per Team			
Digital hydrometer	Anton Paar	Per Team			
State-of-Health tester	Impedance or conductance tester	Per Team			
Scopemeter	Fluke	Per Team			
Circuit breaker simulator		Per team			
Audio measuring set		Per team			

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Handheld Signal Strength measuring set (FSM 500)		Per team			
LAN tester		Per team			
Bird Watt meter or VSWR meter		Per team			
ASE2000 Communication Test Set	V1 or V2	per Team			

*\*\*When test equipment would be hired, a hiring letter from the reputable hiring agency is required.*

**DECLARATION:** I hereby confirm that the test equipment list above is a true reflection of the test equipment owned or hired by my Company.

I will also ensure that all test equipment will be enough to cater for multiple full teams and equipment that require calibration will have valid calibration certificates before the execution of work.

**Signed:** \_\_\_\_\_(Company Rep)

**Date:** \_\_\_\_\_

**Rep Name:** \_\_\_\_\_

**Tendering Company:** \_\_\_\_\_

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**Annexure G: Software List**

Please, complete this annexure, and submit it with the tender document. Examples are provided below; however, this is not an exhaustive list. Ensure that you list all relevant software required for the project.

Computer test software** to be used for construction (include Version no.)	Description of what the software does (and also which relay scheme it is used with)	Requirement	Indicate if owned(O) or to be Purchased (P)
Omicron Test Universe V4.3 (Update as released)	Secondary injection of relays	Per Team	
Primary Test Manager V3.4	Primary testing transformers, VTs and bushings and analysis	Per Team	
CT Analyzer Suite V5	CT Testing and analysis	Per Team	
FRAnalyzer V2.2	Sweep frequency test on transformer	Per Team	
PowerDB11 lite	Megger Insulation resistance testing	Per Team	
Wireshark 2.2.1 or latest	Sniff network packets; eg. IEC61850 GOOSE	Per Team	
IED Scout	IEC61850 Network Software	Per Team	
PCM600 2.3 and 2.10	To connect to ABB Relion series relays,RED760,REF615	Per Team	
DIGSI 4.94	Connect to Siemens 7SS Bus Zone relay	Per Team	
Qualitrol	Connect to disturbance recorder	Per Team	
Specific Point of Wave Software	Point of Wave relays	Per Team	
REG-D Software	Tap changer software	Per Team	
METES 320 Software	Meter accuracy verification METES 320 software	Per Team	
ION Setup	Schneider PM8000 configuration software	Per technician	
Landis + Gyr MAP 120	Landis + Gyr configuration software	Per technician	
Landis + Gyr MAP 110	Landis + Gyr configuration/downloading software	Per technician	

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Osprey Lite	Configuration software for CT Labs Vecto III	Per technician	
Cordex Controller Software	Relevant Cordex controller software with corresponding software and bootloader/operating system versions. Detail the software/bootloader/operating system versions	Per Technician	
ASE2000 Communication Test Set V1 (Driver ver 0.1.0.56)	Driver for ASE Protocol Test Set	per Team	
ASE2000 Communication Test Set V2 (Driver ver 2.7.0.0)	Driver for ASE Protocol Test Set	per Team	
ABB ITT600 (Integrated Testing Tool) (V2.0 or later)	Integrated Testing Tools for AB IEC61850 commissioning	per Team	
ABB RTUtil560 (Ver 7.1.1.0)	Configure ABB RTU560 CMU04 (500 series fdr schemes)	per Technician	
ABB RTUtil560 (Ver 9.9.2.0)	Configure ABB RTU560 CMU05 (670 series fdr schemes)	per Technician	
ABB RTUtil560 (Ver 7.6.1.0)	Configure ABB RTU560 CMU04 (SVCs & Komsberg Series CB)	per Technician	
ABB RTUtil560 (Ver 6.3.230.1)	Configure ABB RTU560 SLI (Proteus & Bacchus Series CB)	per Technician	
Unicon (Ver 1.7.24)	Configure IST Talus RTU or BP devices	per Technician	
GE Config Pro (V6.00)	Configure GED20 & D25 RTUs	per Technician	
GE DS Agile Studio (V2.5)	Configure D400 Firmware ver 5.5	per Technician	
GE Energy IEC 61850 Loader (Ver 2.1.4.9344)	Configure D400 Firmware ver 2.75	per Technician	
GE D400 Utilities (Ver 1.8)	Configures D400	per Technician	
GE D400 Utilities (Ver 2.0.3.9344)	Configures D400	per Technician	
D400 Runtime HMI (Ver 5.5)	DSAS D400 Browser	per Technician	
CIRC (Ver 1.54)	Configure D400 Interlocking	per Technician	
IST Estex (Ver 2.00)	PC Estel Protocol Simulator	per Technician	

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IST RTU Logger (Ve 1.00 (2010Build)	IST serial logs upload	per Technician	
IST VT Terminal	IST Talus RTU Terminal Emulator	per Technician	
Siemens SICAM PAS (Ver 9.17)	Siemens Gateway Software	per Technician	
WINCC Runtime (Ver 7.5 SP2 + Update)	Siemens HMI software	per Technician	
SICAM SCC (Ver 9.07)	Siemens HMI software	per Technician	
Schneider Electric Vijeo Citect SCADA Software (Ver 2015)	Citect HMI software	per Team	
DIGSI 5 (Ver 7.5)	Configure Siemens Siprotec IEDs (Pinotage SS only)	per Team	
DIGSI 5 (Ver 8.7)	Configure Siemens Siprotec IEDs	per Team	
SEL AcSELerator Architect (Ver 2.3.6.1014)	Configure SEL IEC 61850 systems	per Technician	
SEL AcSELerator RTAC (1.32.148.7000)	Configure SEL RTAC devices	per Technician	
IEC Browser (V03.50)	IEC61850 Diagnostic Tool	per Technician	

**DECLARATION:** I hereby confirm that the software list above is a true reflection of the software owned or hired by my Company.

I will also ensure that all software will be enough to cater for multiple full teams and software that require licenses will be procured and activated before the execution of work.

**Signed:** \_\_\_\_\_(Company Rep)

**Date:** \_\_\_\_\_

**Rep Name:** \_\_\_\_\_

**Tendering Company:** \_\_\_\_\_

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**Annexure H: Training Courses per technician**

Please, complete this annexure, examples are shown, and submit it with the tender document, indicating the training and courses related to this tendered project that each employee (to be involved with this tendered construction project) has undergone. This requirement also includes employees who would be employed on temporary basis for this tendered project.

Submit copies of the training certificates and these copies must be certified by the Commissioner of Oaths, with a signature and date not older than three months from the tender closing date.

Training certificates need to be still valid on the date of tender close. Certificates that have expired prior to this date would not be accepted as valid evidence.

Name and surname		
Position held		
Related training and courses completed	Date obtained	Expiry date
Competency in power system protection, including breaker and a half operation. Eg, reading technical drawings, substation automation using IEC61850, secondary plant injection test tests, primary plant injection test tests.		
Competency in Control and Automation		
Competency in SCADA.		
Competency in Metering.		
Competency in Teleprotection.		
Competency in DC & Auxiliary Systems.		
Competency in Access Control & Security Systems.		
ORHVS as a Responsible/Authorised Person		
<p><b>DECLARATION:</b> I hereby confirm that the training courses above is a true reflection of the resource employed by my company.</p> <p><b>Signed:</b> _____ (Company Rep)    <b>Date:</b> _____</p> <p><b>Rep Name:</b> _____    <b>Tendering Company:</b> _____</p>		

**Annexure I: Organogram, CV's & Project Experience**

Tenderers are required to submit company organogram together with CV's of each key person that will work on this scope. Also, please complete all sheets to this annexure and submit it with the tender document.

Note: Tenderers are requested to indicate if Eskom may contact customers listed below for reference feedback. To this end Eskom may request contact details during the evaluation.

Equipment or device description	Has the tenderer installed it before? [Yes / No] + [Reference]	Has the tenderer tested it before? [Yes / No] + [Reference]	Has the tenderer commissioned it before? [Yes / No] + [Reference]
<i>(For example, for a current transformer)</i>	<i>Yes – Customer, Site Name, Date, Responsible Technician Name,</i>	<i>Yes – Customer, Site Name, Date, Responsible Technician Name,</i>	<i>Yes – Customer, Site Name, Date, Responsible Technician Name,</i>
1. Microprocessor based relay/scheme with digital communications used for the protection of a power <b>TRANSMISSION FEEDER</b> with voltages rated from 220 kV to 765kV			
2. Microprocessor based relay/scheme with digital communications used for the protection of a power <b>TRANSMISSION FEEDER SCHEMES WITH TRANSFER</b> with voltages rated from 220 kV to 765kV			
2. Microprocessor based relay/scheme with digital communications used for the protection of power <b>SUB-TRANSMISSION FEEDER</b> with voltages rated from 11 kV to 132 kV			
3. Microprocessor based relay/scheme with digital communications used for the protection of <b>POWER TRANSFORMER</b> (2-winding or 3-winding) with terminal voltages rated from 11kV to 765kV			

## Annexure I: Project Experience Continued

Equipment or device description	Has the tenderer installed it before? [Yes / No] + [Reference]	Has the tenderer tested it before? [Yes / No] + [Reference]	Has the tenderer commissioned it before? [Yes / No] + [Reference]
4. Microprocessor based relay/scheme with digital communications used for the control of the <b>ON-LOAD TAP CHANGER</b> of a power transformer (2-winding or 3-winding) with terminal voltages rated from 11kV to 765kV			
5. Microprocessor based relay/scheme with digital communications used for the <b>BUSBAR ARC DETECTION</b> protection with terminal voltages rated from 11kV to 765kV			
6. Microprocessor based relay/scheme with digital communications used for the protection of a <b>BUSZONE</b> with voltages rated from 11kV to 765kV			
7. Microprocessor based relay/scheme with digital communications used for the <b>BUSSECTION</b> protection with voltages rated from 11kV to 765kV			
8. Microprocessor based relay/scheme with digital communications used for the <b>BUSCOUPLER</b> protection with voltages rated from 11kV to 765kV			
9. Microprocessor based relay/scheme with digital communications used for the <b>CAPACITOR BANK</b> protection with voltages rated from 132kV to 765kV			

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## Annexure I: Project Experience Continued

Equipment or device description	Has the tenderer installed it before? [Yes / No] + [Reference]	Has the tenderer tested it before? [Yes / No] + [Reference]	Has the tenderer commissioned it before? [Yes / No] + [Reference]
10. Microprocessor based relay/scheme with digital communications used for the protection of <b>REACTOR</b> with terminal voltages rated from 11kV to 765kV			
11. Microprocessor based relay/scheme with digital communications used for the <b>UNDER FREQUENCY LOAD SHEDDING (UFLS)</b> protection with voltages rated from 11kV to 132kV			
12. Microprocessor scheme with digital communications used for <b>REMOTE ENGINEERING</b> of substation protection and control equipment and devices			
13. <b>MAGNETIC VOLTAGE TRANSFORMER</b> with primary terminal voltages ranging from 11kV to 765kV			
14. <b>CURRENT TRANSFORMER</b> with primary terminal voltages ranging from 11kV to 765kV			
15. <b>CAPACITOR VOLTAGE TRANSFORMER</b> , with the primary terminal voltage ranging from 220kV to 765kV			
16. <b>BREAKER AND A HALF CONFIGURATIONS</b> , with the primary terminal voltage ranging from 132kV to 765kV			

## Annexure I: Project Experience Continued

Equipment or device description	Has the tenderer installed it before? [Yes / No] + [Reference]	Has the tenderer tested it before? [Yes / No] + [Reference]	Has the tenderer commissioned it before? [Yes / No] + [Reference]
17. Microprocessor relay/scheme with digital communications used for <b><u>DISTURBANCE RECORDERS</u></b> of substation protection and control equipment and devices.			
18. Microprocessor relay/scheme with digital communications used for <b><u>QUALITY OF SUPPLY</u></b> of substation protection and control equipment and devices.			
19. <b><u>SCADA</u></b> , with the primary terminal voltage ranging from 11kV to 765kV			
20. <b><u>METERING</u></b> , with the primary terminal voltage ranging from 11kV to 765kV			
21. <b><u>TELEPROTECTION</u></b> , with the primary terminal voltage ranging from 11kV to 765kV			
22. <b><u>SUBSTATION TELECONTROL AND NETWORKING EQUIPMENT</u></b>			
23. <b><u>DC &amp; AUXILIARY SYSTEMS</u></b>			
24. <b><u>ACCESS CONTROL &amp; SECURITY SYSTEMS</u></b>			
25. <b><u>MODEM</u></b>			
26. <b><u>TRANSDUCER</u></b>			

**DECLARATION:** I hereby confirm that the Project Experience above is a true reflection of the resource employed by my company.

**Signed:** \_\_\_\_\_ (Company Rep) **Date:** \_\_\_\_\_

**Rep Name:** \_\_\_\_\_ **Tendering Company:** \_\_\_\_\_

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