Eskom	Standard	Technology

Title: **TECHNICAL EVALUATION CRITERIA FOR HIGH VOLTAGE SWITCHGEAR STANDARD**

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PCM Reference: **<xxxxxx>**

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Content

1. Introduction

This document is aimed at setting the standard technical evaluation criteria to be used when evaluating the tender submissions. This covers the technical evaluation on live-tank circuit-breakers, dead-tank circuit-breakers, and equipment training for Eskom Holdings SOC (Ltd). It has Annexures developed to address various aspects required to perform the technical evaluation. It has been drawn from the equipment Standards.

Each voltage level according to the issued Technical A&B schedules shall be treated and evaluated separately through all the technical evaluation stages contained in this document. The successful Tenderer shall be required to prepare for a detailed Design Review with the Eskom technical evaluators

2. Supporting clauses

2.1 Scope

This document covers the technical evaluation criteria for all live-tank circuit-breakers, dead-tank circuit-breakers, and equipment training within Eskom Holdings SOC (Ltd).

2.1.1 Purpose

This document addresses the standard documented technical evaluation criteria to be used when performing the technical evaluation of the tender submissions in line with Eskom Holdings SOC (Ltd) requirement. The Technical evaluation report shall be compiled for Eskom purposes based on this document specified evaluation criteria.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions.

This standard is applicable to all technical evaluations of the tender submissions for circuit breakers, and switchgear training as per Eskom Holdings SOC (Ltd) requirements.

2.2 Normative/informative references

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

2.2.1 Normative

[1] ISO 9001 Quality Management Systems.

[2] 240-56063756, Outdoor Circuit Breakers for system with nominal voltages from 6.6kV up to and including 132kV Standard.

[3] 240-56030435, Outdoor Ceramic Station Post Insulators for Systems with Nominal Voltages up to 765kV Standard.

[4] 240-124520996, Switchgear training requirements from Original Equipment Manufacturers Standard.

[5] SANS/ IEC 62271-1, Common specifications for high voltage switchgear and control gear standards

[6] SANS/ IEC 62271-100, High voltage switchgear and control-gear: Part 100: High voltage alternating current circuit-breakers

[7] SANS/ IEC 60050(441):1984: International Electrotechnical Vocabulary – Chapter 441: Switchgear, controlgear and fuses

2.2.2 Informative

[8] 32-1034, Eskom procurement and supply management procedure.

2.3 Definitions

2.3.1 General

Definition	Description
Submission	The tender in accordance with the requirements of the enquiry
Technical evaluator	End-users, technical experts nominated by the end-user and Divisional technical functionaries with the necessary technical expertise.
Circuit-breaker	The mechanical switching device that can make, carrying and breaking the normal currents, and making and carrying for a specified time, and breaking currents under specified abnormal circuit condition such as those of short circuit. [IEV 441-14-20 definition] [2] (**Note**: without malfunctioning when called to operate, even when it has been standing in one position for long duration.)
Live-tank circuit-breakers	[IEV 441-14-26 definition] [2] A circuit-breaker with interrupters in a tank insulated from earth.
SF6 circuit-breaker	[IEV 441-14-29 definition] [2] A circuit-breaker in which the contacts open and close in sulphur hexafluoride.
Threshold for Qualification	This is the threshold that has been determined by Eskom Technical evaluation, which the submission must meet to proceed with the technical evaluation after scoring stage.
Vacuum circuit-breaker	[IEV 441-14-29 definition [2]; also IEC 62271-100 clause 3.4.108] A circuit-breaker in which the contacts open and close within a highly evacuated envelope.

2.3.2 Disclosure classification

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

2.4 Abbreviations

Abbreviation	Description
CB	Circuit-breaker
LTCB	Live-tank circuit-breaker
Eskom	Eskom Holdings SOC (Ltd)
OEM	Original Equipment Manufacturer
OU	Operating Unit
PI	Post insulator
RFI	Request for Information
RFQ	Request for Quotation
g	Acceleration due to gravity

2.5 Roles and responsibilities

Technology & Engineering, Substation and Lines – Compiles this document with inputs from the switchgear Care Groups and Work Groups. Maintain this document up to date with the technical standards.

Commercial – Make use of the up-to-date version of this document during commercial processes.

Technical evaluator – Implement the contents of this document applicable to equipment covered by its scope. Provide the evaluation report that indicates and refers to the clauses of this document.

2.6 Process for monitoring

Not applicable.

2.7 Related/supporting documents

240-46425564 Rev 0, Technical Evaluation Criteria for High Voltage Switchgear

240-46425564 Rev 1, Technical Evaluation Criteria for High Voltage Switchgear

3. Document content

3.1 Scope of work

Unless otherwise stated by the Procurement documentation, the scope of work shall be the design, manufacture, testing, supply, delivery, off-loading, installation, testing, commissioning, and building of the switchgear and provide technical training

3.2 Desktop evaluation

This evaluation exercise is performed by the Eskom technical evaluators. This part of the evaluation starts when the technical submissions are opened for the first time. It begins at evaluation of the Mandatory criteria Stage 1, then proceeds to the Scoring – Stage 2, and refers to relevant Annexures for each switchgear item required (refer to Annex A to Annex F).

The Eskom technical evaluator will go through the details of the returnable submissions that are required and will ensure that Stage 1 qualification criteria are met. Stage 1 returnables are the following: -

1) Completed Technical A & B schedules

2) Type test reports

3) Drawings

4) Operation and Maintenance Instruction Manuals

Note: If the above 4 returnables are not available on each technical submission of that item tendered for, that technical submission is disqualified.

Only the tender submission that has complied with the Stage 1 requirement, shall be taken through to Stage 2 of Desktop evaluation. The full scoring that the technical submission can score under Stage 2 is 100%. The technical threshold for qualification is 75%.

The successful tender submission that scores 75% and above, shall be considered for further technical evaluation process. Any technical submission that scored below 75% is disqualified for any further evaluation.

The Eskom technical evaluators shall perform the following to the tender submission that has successfully met the technical threshold for qualification of 75%: -

a) Compile list of technical deviations.

Note: It must be noted that when the Supplier has listed the technical deviations on an offered item, it does not mean that such are already acceptable to Eskom.

b) Perform factory Evaluation and product Evaluation including raising the technical deviations that form part of the objective or discretionary requirements.

3.3 Factory and Product Evaluation

The Eskom registered confidential Desktop evaluation report which indicates the technical submission items that were evaluated and those that met the technical threshold for qualification, will be presented to Commercial. The selection of the suppliers and factories to be visited shall be upon Eskom discretion.

The purpose of the factory visit is to perform the factory Evaluation, to assess the capability of the factory to deliver the requirements. The factory product Evaluation at the factory is to ensure if the product meets the technical requirements as specified. During this visit, Eskom will also discuss the technical deviations that the technical evaluators found during the Desktop evaluation. The technical evaluators shall populate the applicable Product Evaluation Check Sheets for all findings, and these shall be raised with the supplier and factory representatives and recorded under the Evaluation Agreement Form (Annex D). An Eskom confidential report will be produced for these Evaluations.

The technical evaluator is responsible for explaining to the tenderer and factory representatives that the purpose of the visit is not a negotiation, but purely an Evaluation of the product which has been offered to ensure the compliance with Eskom requirements as specified.

3.3.1 Factory Evaluation

Eskom technical evaluators will visit the factory to assess the capabilities of the factory, machinery, skills, and technical processes, to ensure the factory can deliver on the requirements. The following will be included: -

- Manufacturing Methods
- Workshop Practices
- Design Practices and Application
- Testing Facility and Practices
- Raw material Procurement, Storage and Sub-contractor practices
- Site and Other Services
- Factory Performance (including the On Time Delivery (OTD) and Factory Failure Rate (FFR))

The factory evaluation criteria are as shown in Annexure F. The OEM must obtain at least 80% to pass the factory evaluation. Where the criterion is met, one point will be awarded and zero points will be awarded for criterion not met, e.g. Yes = 1 and No =0. The factory evaluation results are not a gatekeeper for product evaluation. All findings and recommendations will form part of the evaluation agreement form.

3.3.2 Product Evaluation

At the factory, the technical evaluators shall verify the **type test records** kept. Furthermore, the Eskom technical evaluators shall assess the product(s) using the Compliance Clause by Clause Schedule (Annexures B), Check Sheets (Annexure E) and Evaluation Agreement document (Annexure D). The Check Sheets are used to ascertain compliance of the tender submissions to Eskom specification. Any deviations will be listed on the Evaluation Agreement document. Factory failure rate and supporting documentation will be required as per Clause 3.5.2.

The technical evaluators, the tenderer and factory representatives shall sign the completed Evaluation Agreement document which is used to conclude the product evaluation. It shall be emphasised by the technical evaluators that the Evaluation Agreement document is not meant for negotiating deviations, but rather to get consensus on the findings and state of the product and the compliance improvements.

The technical evaluators shall re-assess the score allocated for the desktop evaluation (Level 3) taking into consideration the findings made on the product evaluation at the factory.

The final technical evaluation report will be compiled comprising the desktop evaluation results, factory evaluation results and product evaluation results.

3.4 Prior to Contract Award

Eskom reserves the right to shortlist the suppliers/ tenderers based on the compliance of all other evaluations, after the factory and product evaluation. The technical evaluators shall meet with those shortlisted suppliers/ tenderers prior to contract award. The following shall be discussed in detail: -

- Closing of the technical deviations
- Training
- Final design of the Controlled switching devices and/or Online condition monitoring devices, where applicable.
- Optional digital secondary plant interface where, applicable.

3.5 Final Product Acceptance Post Contract Award

3.5.1 Detailed Design Review (pre-manufacturing)

The following for the technical submission shall be addressed by the technical evaluators with the successful supplier/ tenderer prior to manufacturing and onsite works: -

- Final drawings – equipment, secondary wiring schematics, and where applicable, the optional digital secondary plant interface
- The details of training levels rollout strategy

3.5.1.1 Factory Acceptance and Routine Tests Witnessing

Eskom shall witness factory and routine testing. During this visit all the Controlled switching devices and/or online Condition monitoring devices and secondary control and protection devices (including the optional digital secondary plant interface) shall be inspected and witnessed their designed functionality.

3.5.1.2 First Batch Inspection and Closing out of Deviations

All outstanding deviations and/ or factors that the supplier/ tenderer agreed to rectify as per the signed Evaluation Agreement document, desktop evaluation findings and product acceptance stages shall be closed out within the agreed time frames. The technical evaluators shall make the follow-up evaluation to ensure closeout post contract award. Also, the first-off installations shall be inspected by both parties.

3.5.2 Factory Failure Rate (FFR)

The number of units tested and failed divided by the number of total units tested times 100, per calendar year for units rated for

a) Units rated for 11 – 66kV. The limit for Eskom to do business with a factory must be less than 7.5%.

b) Units rated 132 kV or the highest rating the factory makes. This limit for the Eskom to do business with a factory must be less than 5%.

The submission must contain FFR for the last 5 years and the figures supplied by the OEM must be auditable.

4. Authorisation

This document has been seen and accepted by:

Name & Surname	Designation
Mfundi Songo	Senior Manager Technology-Engineering
Simphiwe Mbonambi	Procurement Manager (Commercial)
Jabulani Cebekhulu	Air Insulated Switchgear Care Group Convener

Name & Surname	Designation
Vuyani Masuku	Technology-Engineering

5. Revisions

Date	Rev	Compiler	Remarks
June 2025	9	V. Masuku	Annexure E and F added. Factory evaluation updated. Headings re-organized.
June 2023	8	I Sibeko	The document is now applicable only for Distribution. The normative references have been updated.
Sept 2017	7	S Nkosi	Final authorised version
Aug 2017	6.1	S Nkosi	Circulated for SCOT process comments and voting Revised the following clauses: - - 2.5 – Roles - 3.1.1 (b) – Factory and product Evaluation - 3.2 – Operating and Maintenance Instruction Manuals - Annex A, B, C and D – Training, Type tests and Operating and Maintenance Instruction manuals - Revised the Threshold for qualification
June 2017	6	S Nkosi	Final authorised version
June 2017	Draft 5.1	S Nkosi	Document revised to reflect the technical Threshold for qualification. Sections replaced to align with 240-70413969 (MV AIS and Kiosk switchgear), 240-83011927 (Technical evaluation criteria for Fordsburg) and some parts of the 240-79707491 (Station post insulators) Added requirements for HVDC bypass switchgear.
Sept 2015	5	S Nkosi	Final authorised version
June 2015	Draft 4.1	S Nkosi	Circulated for comments and voting SCOT and Transmission upon updating the document to align with the Procurement policy 32-1034 on the PPPFA requirements and scoring
June 2014	4	S Nkosi	Alignment with the revised 32-1034 Rev 2 and 240-53207174 – Practice Note and Guide on the implementation of the Preferential Procurement Policy Framework Act (PPPFA)
May 2014	3	S Nkosi	Alignment with the Standards revised in May 2014: – Appendix A – Introduced Maintenance analysis and Digital secondary plant interface requirement Removed all Station Post Insulators technical evaluation criteria
Aug 2013	2	S Nkosi	Revised the details of the document in accordance with the Standards that have been revised with the “240- ” numbering. Updated the changes that are on these Standards. Revised Check sheets
March 2013	1	S Nkosi	Revised the document to the new Eskom format. Introduced clause 4.5; Made minor changes on the document in-line with the changes on the Specifications;

6. Development team

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

- Sphiwe Nkosi — PDE – HV Plant
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- Isaac Sibeko — PDE – HV Plant
- Kevin Kleinhans — PDE – HV Plant
- Phineas Tlhatlhetji — PDE – Substation Design
- Mario Petersen — PDE – Secondary Plant
- Stuart van Zyl — PDE – Secondary Plant
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- Almund Cilliers — Dx OU (Northern Region)
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7. Acknowledgements

The author acknowledges the input from the members of the AIS Care Group, Transmission Switchgear Work Group and Distribution Switchgear Care Group and the Switchgear Cross-functional Team.

Annex A – Circuit Breaker Technical Evaluation Criteria

Standard: 240-56063756 – Outdoor Circuit Breakers for system with nominal voltages from 6.6kV up to and including 132 kV Standard

Desktop Evaluation Criteria			
Level 1 Gatekeeper – Mandatory			
Task / Measure			
Activity	**Clause**	**Score**	**Gatekeeper type**
Is completed Schedule B submitted?	3.2.23.1a)	Yes / No	Level 1
Are technical deviations submitted?	Annex B	Yes / No/ Not Applicable	Level 1
Drawings: Outlines/ GA submitted?	3.2.23.1b)	Yes / No	Level 1
Drawings: Wiring Schematics submitted?	3.2.23.1e)	Yes / No	Level 1
Drawings: Rating/ Nameplate submitted	3.2.21	Yes / No	Level 1
List of type-tests	3.3.1.2.a)	Yes / No	Level 1
Type-test Certificates	3.3.1.2.a)	Yes / No	Level 1
Type-test Reports	3.3.1.2.a)	Yes / No	Level 1
Are training contents submitted?	3.7	Yes / No	Level 1
Has the wiring terminal detail been submitted?	3.2.20; Technical Schedule A, clause 23	Yes / No	Level 1
Are manuals submitted in English?	3.6.1; 3.6.2	Yes / No	Level 1
Level 2: GATEKEEPERS			
Technical schedules			
Does it meet Eskom schedule A *"non-shaded"* requirements? (all items must comply or be better than the prescribed value/ description on schedule A).		Yes/ No	Level 2
Type Test Certificates			
Has the circuit breaker been type-tested to IEC62271-100 standard? Proof of compliance must be submitted.	1; 3.2.2	Yes/ No	Level 2
Has type testing been performed at an ISO/ IEC or equivalent Accredited Test facility i.e. including country standards authority?	Annex A.1(b)	Yes/ No	Level 2

Training			
Are the training instructors authorised by the OEM to perform the training?	3.7	Yes/ No	Level 2
Technical Support			
Is LOCAL aftersales technical specialist support available?	3.4.10	Yes/ No	Level 2
Other Requirements			
Is the written commitment to provide maintenance USB provided?	3.2.23.1. p13; 3.5.2	Yes/ No	Level 2
Level 3 – SCORED CRITERIA			
Task/ Measure			
A: Technical schedules			
Activity	**Clause**	**Weight [pts]**	**Score**
Are all *"shaded"* boxes completed on Schedule B?		50 (NB: Score each deviation -5pts)	
Clause by clause schedule deviations?		50 (NB: Score each deviation -5pts)	
Total score (A)		**100**	
B: Drawings			
B1) Outline or General Assembly			
Activity	**Clause**	**Weight [pts]**	**Score**
Drawing number	3.2.23.1b)	5	
Revision number	3.2.23.1b)	5	
Detailed description provided in "Title".	3.2.23.1b)	10	
Dimensions	3.2.23.1b)	10	
Approved by & the date of drawing approval provided		5	
Completed legend	3.2.23.1b)	5	
Terminal details	3.2.23.1b)	10	
Mass in kilograms	3.2.23.1b)	5	

Loading details, forces and moment details	3.2.23.1b)	15	
External insulation details	3.2.9	15	
General arrangement of mechanism enclosure	3.2. 4	15	
Subtotal (B1)		**100**	
B2) Wiring diagram			
Activity	**Clause**	**Weight [pts]**	**Score**
Drawing number	3.2.20	10	
Revision number		10	
Detailed description provided in “Title”.		10	
Approved & date drawings		10	
Contact arrangement	240-56030489–132kV & below	60 (NB: Score each deviation - 5pts)	
Subtotal (B2)		**100**	
B3) Rating / Nameplate			
Activity	**Clause**	**Weight [pts]**	**Score**
Fixing details	3.2.21d)	20	
Material details available	3.2.21d)	20	
Technical rating details	3.2.23	60 (NB: Score each deviation - 5 pts)	
Subtotal (B3)		**100**	
Total B (B1 x 0.4+B2 x 0.4+B3 x 0.2)		**100**	
C: Type Test and Routine Test Certificates and Reports			
Activity	**Clause**	**Weight [pts]**	**Score**
Compliance to tests listed on Eskom CB Standard (Score the tests IEC62271-100 spec evenly).	3.3.2	100	
Total (C)		**100**	

D: Manuals and Requested Information (Operation & Maintenance)			
Activity	**Clause**	**Weight [pts]**	**Score**
Transport & Storage	3.4	20	
Installation & Testing	3.4	20	
Inspection & Maintenance	3.4	20	
Dismantling, repair, settings, inspections & lubrication - Special tools list - Spares parts list	3.4	40	
Total (D)		**100**	
E: TRAINING & TECHNICAL SUPPORT			
Clause by clause Training Spec deviations	Training Standard 240-124520996	85	
Local aftersales technical specialist support offered?	3.4.10	15	
Total (E)		**100**	
Grand Total (A+B+C+D+E)		**500**	
Final score (Grand Total x 20%)		**100%**	
Threshold			**80%**
Outcome			**DIS/QUALIFIED**

Annex B – circuit-breaker compliance clause by clause schedule

Standard: 240-56063756 – Outdoor Circuit Breakers for system with nominal voltages from 6.6kV up to and including 132 kV Standard		
* If the Supplier does not comply', then it shall be covered in the Deviation Schedule		
Clause	**Question/ Item**	**Response (Yes or No)**
3.1.12 e	Does the circuit-breaker open-close-open before the closing spring needs to be charged again?	
3.1.15 c)	For shunt capacitor switching, is the circuit-breaker capable to operate without need for controlled opening/ closing?	
3.1.15 c)	Can the circuit-breaker be used on a capacitor connected to busbar or through thyristor switched reactive power controller?	
3.1.15 c)	Does the CB meet the requirements under the NOTES (5 listed points) of this clause?	
3.1.15	Does the CB meet the requirements of this clause and the NOTES (4 listed points)?	
3.2.1 b)	132kV and below: Is the circuit-breaker suitably rated for application on the systems that is non-effectively earthed neutral?	
3.2.4 m)	Does the design use the normal gland plate and terminations made on terminals, not the plug-in type cabling?	
3.2.5 a)	Are all mechanical loads and parameters relating to the design of the circuit-breaker support structure and foundation shown on the general arrangement (outline) drawing?	
3.2.5 a)	Is the steel support designed in accordance with the Eskom specified details?	
3.2.6 a)	Are all exposed metal protected against corrosion in accordance with DSP 34-1658 for outdoor "high" to "very high" (i.e. coastal) corrosivity rating environments?	
3.2.6 b)	Is the minimum detailed specification ("DS") for all exposed metal in accordance with DSP 34-1658, "DS-11"?	
3.2.6 c)	Has the Supplier submitted with this tender submission, all identified lubricants used and tests carried out to prove suitability for the application?	
3.2.6 c)	Has the Supplier provided the list of equivalent lubricants from South African sources?	
3.2.6 d)	Are MSDS sheets for all liquids or chemicals supplied?	
3.2.6 e)	Has the Supplier provided the details of measures to prevent flange corrosion, including drawings of the flange arrangements, treatments and service experience?	
3.2.6 f)	Has the Supplier provided Material and Corrosion Protection Information for each tendered design?	
3.2.6 f)	Are anti-condensation heaters rated for single-phase 230 V a.c.?	
3.2.6 f)	Are they designed to maintain dew-point above ambient temperature and constantly circulate air to all parts of the mechanism enclosure?	
3.2.6 f)	Do the heater control comply with 240-56030489 and if 132kV and below D-DT-5407;	

3.2.7 a)	Are the fixed HV terminals arranged such that they can be removed without interfering with the integrity of the circuit-breaker?	
3.2.7b)	Is the circuit breaker earthing achieved through the steel structure?	
3.2.7b)	If not above, is a suitably rated conductor (not copper) provided between the circuit-breaker and the support structure?	
3.2.8 e)	Has the Supplier provided details with this tender documentation (refer to 5.24.1) regarding the time during which an arc due to an internal fault up to a given value of short-circuit current will cause no external effects? (Refer to D.1 of SANS 62271-203)	
3.2.9 a)	Are insulators of the ceramic type in accordance with the requirements of SANS 62155 and SANS 60815-2?	
3.2.9 a)	Are insulators of the silicone rubber composite type in accordance with the requirements of SANS 61462 and SANS 60815-3?	
3.2.11 b)	If rotary switch applicable: Is the rotary switch turned anti-clockwise to trip, and clockwise to close?	
3.2.11 b)	If push-buttons applicable: Is the trip button at the bottom or to the left of the close button [IEC 60447]?	
3.2.11 b)	Are the trip and close controls colour coded (opposite to IEC 60073), with Red = Close and Green = Trip? If not, are they without unique colour?	
3.2.11 c)	Are warning labels provided for danger when manually operating the circuit-breaker without adequate insulation and/or extinguishing medium?	
3.2.11 d)	Are warning labels provided inside the mechanism for minimum time interval required between repeated C-O operations during testing?	
3.2.11 e)	The function not clearly identified by pictograms; do they have labels in text using black letters at least 5 mm high on a white background?	
3.2.11 f)	Are all labels manufactured in accordance with 240-56062515 and using inherently corrosion-resistant rivets or self-tapping screws?	
3.2.11 f)	Are there no "stick-on" labels, double sided tape or glue used?	
3.2.12 b)	When installation is called for, are circuit-breakers filled with the new SF6 or environmental friendly insulation and/or extinguishing medium at the rated normal pressure?	
3.2.12 e)	132kV and below circuit-breaker: Are the filling/evacuation points of DILO DN8 connections provided? (for SF6 or other environmental friendly insulation and/or extinguishing medium)	
3.2.12 e)	Are Pressure gauges numerically marked and calibrated in Pascal's (kPa or MPa)?	
3.2.12 e)	Are Gauges measuring in "absolute" pressure and clearly labelled 'ABSOLUTE'?	
3.2.12 e)	Rated pressure shall be no more than 80% of the full-scale reading.	
3.2.13 a)	If DTCB: Are ring-type CT's manufactured and tested in accordance with IEC 61869-1, SANS 60044-1 (IEC 61869-2), SANS 60044-6 and NRS 029 (IEC 61869-6)?	
3.2.13 e); 3.2.13.1	If DTCB: Does, the CT design comply with the clause' specific requirements for dead tank circuit breaker CT's?	
3.2.13.2	Are the details of magnetizing curves (on a log-scale) provided?	

3.2.14 a)	Is the electronic controller for switching surge control IEC61850 protocol compliant?	
3.2.18 a)	If applicable, are full details of the controlled switching system i.e. the OEM's technical specification/ manual for the controller and necessary sensors and auxiliary equipment required to achieve controlled switching, supplied as per 3.2.23.1 p) ix.?	
3.2.18a)	Is the circuit-breaker capable of switching without the use of a controlled switching system?	
3.2.18Notes	Are all accessories and cabling provided with the Point on Wave relay?	
3.2.18b)	Has this circuit-breaker been tested in accordance with SANS 62271-302 for inductive load switching?	
3.2.18 b)	Has it been tested independent from any controller or whether it was tested with a dedicated controller and the necessary sensors and auxiliary equipment which form part of the tested equipment?	
3.2.18 c)	Has the Supplier provided details regarding the mechanical characteristics of the circuit-breaker which affect the mechanical operating time, e.g. influence of ambient temperature, substation d.c. control voltage, standing time, operating pressure, contact wear?	
3.2.18 c)	Are the causes of deviations in operating times indicated in all cases, e.g. arising in the operating coil/latch assembly, energy storage device, etc?	
3.2.18 c)	Has the Supplier provided details of the circuit-breaker dielectric characteristic – as a function of time (closing), and as a function of filling pressure up to the maximum rated design pressure? Also the upper and lower limits of the dielectric characteristic which can be expected over the service life of the circuit-breaker?	
3.2.18 c)	Has the critical arcing time window been indicated for re-ignition-free shunt-reactor switching? Is the tolerance less than ± 1 ms required as a function of the above-mentioned parameters?	
3.2.18 c)	Has the Supplier stated, if special measures are required to maintain operating times within the above limits (Refer to 3.2.18 c))?	
3.2.19 b)	Has the Supplier indicated the timing events to determine the correct settings for this control timer? - Same pole, main contact timing and the auxiliary contacts timing (Close & Open)? - Between all poles, main contact timing and the auxiliary contacts timing (Close & Open) assuming command received simultaneously? - Auxiliary contacts designation?	
3.2.20 f)	Does the secondary system of the circuit-breaker experience spurious operation or damage due to induced electromagnetic disturbances?	
3.2.20g)	Is it possible to change the d.c. supply voltage at with the CB operates by only replacing the opening and closing coils, motors, and motor contactor coils? Does the Supplier offer the d.c. supply voltage "conversion kit" for this?	

3.5.3.5	Will the Supplier keep the d.c. supply voltage “conversion kits” locally in South Africa for the duration of the contract to ensure readily availability as and when required?	
3.2.22 f)	Do the nameplates display actual ratings to which the circuit-breaker been type-tested (and not merely the values specified)?	
3.2.22 f)	Did the Supplier provide the written letter that states that in case of the design obsolescence, they shall notify Eskom and present all spares manufacturing drawings and specification (i.e. metal, Bill of material, masses) for the maintenance spares required for circuit breaker life expectancy?	
3.2.23.1 g) – p)	Has all the documentation and additional information stated under this clause been submitted with this tender submission (refer to 3.2.23.1 g) to p))?	
3.2.23.1 b)	Has the Supplier allocated the fields on the drawing for the following: - Eskom order No; Eskom Contract No; Eskom Stock (SAP) No; Eskom drawing No?	
3.2.23.4	Upon contract awarding: Shall the Supplier provide the information required under clause 3.2.24.4?	
3.2.24	Does the packaging and preservation method meet the requirements stated under clause 3.2.25?	
3.2.24.k)	Will the external temporary easily accessible 230 Va.c. connection point be provided, labelled “230 V AC HEATER CONNECTION: CONNECT IF STORED > 2 DAYS”?	
3.3.1.2 b)	Have the generic routine test certificate/reports been supplied with the tender documentation?	
3.3.2 d)	Are the routine tests detailed under clause 3.3.3 being performed by the manufacturer?	
3.3.1.3 a)	Have all the type test certificates together with each test reports (in English) been supplied with this tender submission?	
3.3.2 a)	Are type test reports according to IEC 62271-100?	
3.3.2 b)	Have all the type tests as specified in clause 3.3.2 b) been performed?	
3.3.2 c)	Are time-current curves of the electrical tripping and closing circuits provided, for both normal operations, and if the tripping/closing plunger is prevented from moving? Are the resolution of the function times clearly shown on the report?	
3.3.2 f) – j)	Where applicable, are all the type tests as specified in clause 3.3.2 f) to j) been performed?	
3.3.3 a)	Are site pre-commissioning tests and checks done in accordance with IEC 62271-100 clauses 10.2.101 and 10.2.102?	
3.3.3 b) – i)	Are site pre-commissioning tests and checks done in accordance with clauses 3.3.3 b) to i)	
3.3.3 c)	Are the measured operating times when applying nominal and minimum coil control voltage within ± 5 % of the times from pass sheet results of the factory routine test?	
3.3.3 d)	During each operating time, are the individual coil currents measured and the resolution of the function times clearly shown on the results?	
3.3.3 e)	Is site measured motor current (peak and nominal) within ± 2 % of the circuit-breaker’s pass sheet results of the routine test?	

3.3.3 j)	Are the site pre-commissioning tests documented, signed-off and copy made available for handing over?	
3.5.3.1	Has the Supplier provided a list of the minimum recommended spares (refer to 3.2.23 e))?	
3.5.3.2	Are the following spares readily available in SA within 12 hours? namely, trip coils; close coils; spring charging motors; SF6 density monitoring devices; and contactors and relays.	
3.5.3.3	Are spares identified by a unique number and cross-referenced in the instruction manual?	
3.5.3.4	Is care being taken to ensure that spares are protectively packed for satisfactorily long-term storage?	
3.5.4	Will the details of any modification occurring during service life of the circuit-breakers and the reason be communicated to Eskom as specified?	
3.5.4	In case of the above, will the suitable training and parts be supplied to Eskom within 30 days of any modification required for all circuit-breakers supplied to Eskom?	
3.5.5	Has the Supplier developed practical and innovative methods to improve circuit-breaker's reliability and maintainability (i.e. condition monitoring and/or diagnostics devices to achieve - per pole accumulative current and contact wear; early warning of SF6 gas leaks; SF6 gas test analysis; monitoring, recording and alarm signalling of mechanical characteristics?	
3.5.5	Is the on-line condition monitoring and/or integrated diagnostic device IEC61850 protocol compliant	
3.5.5	Has the Supplier provided all information required to carry out condition monitoring of circuit-breakers (including, but not limited to, specification sheets, speed calculation points, travel curve values, etc.)?	
3.6.1; 3.6.2	Are the manuals written in English?	
3.7	Shall the Supplier provide first-hand training of an international standard on the supplied equipment by the OEM accredited instructors?	
3.7	Can the Supplier provide training that meets the requirements of 240-124520996?	

Annex C – Switchgear Training Standard compliance clause by clause schedule

SWITCHGEAR TRAINING TECHNICAL EVALUATION CRITERIA (Standard: 240-124520996– Switchgear training requirements from Original Equipment Manufacturers)		
* If the Supplier does not comply', then it shall be covered in the Deviation Schedule		
Clause	**Question/ Item**	**Response (Yes or No)**
3.1 (a)	Does the Supplier provide OEM accredited instructors to do first-hand training?	
3.1 (d)	Does the Supplier provide training levels 1 – 4, all in English?	
3.1 (f)	Does the Supplier training consist of 30% theoretical training and theoretical examination? Certification	
3.1 (f)	Does the Supplier training consist of 70% practical training and practical examination?	
3.2.2 (c)	Level 4: Does the training include theoretical and practical training, and all documentation, USBs, and certificates?	
3.2.3.1 (a)	Level 4: Does the OEM agree to offer two yearly re-evaluations of accreditation/certified Switchgear Maintenance Specialists?	
3.2.3.1 (b)	Level 4: Will the Supplier provide training as and when required?	
3.2.4 (c)	Has the Supplier provided the Level 4 training duration on submission?	
3.2.4 (d)	Will the Supplier agree with Eskom on location where Level 4 training will be offered? Will the Level 4 training be offered locally?	
3.3.2 (b)	Level 3: Does the cost of training include theoretical and practical training, and all documentation, USBs, and certificates?	
3.3.2 (Note)	Level 3: Does the training include two yearly re-Evaluations?	
3.3.3.2 (b)	Has the Supplier provided the Level 3 training duration on submission?	
3.3.3.2 (c)	Will the Supplier agree with Eskom on location where Level 3 training will be offered? Will the Level 3 training be offered locally?	
3.4.2 (b)	Level 2: Does the cost of training include theoretical and practical training, and all documentation, USBs, and certificates?	
3.4.3 (b)	Is the duration of Level 2 training one-day?	
3.4.3 (c)	Will the Level 2 training be offered at central Eskom location?	
3.5.2 (b)	Level 1: Does the cost of training include theoretical and practical training, and all documentation, USBs, and certificates?	
3.5.3 (b)	Is the duration of Level 1 training one-day?	
3.5.3 (c)	Will the Level 1 training be offered at central Eskom location?	

Annex D – Product Evaluation Agreement

EVALUATIONS AGREEMENT

No	DEVIATION	RESPONSE	TENDERER		FACTORY		Eskom		Target date
Sec	Comments	Comments	Agree	Disagree	Agree	Disagree	Agree	Disagree	

Eskom Evaluating Representative I			
Name:		Signature:	
Designation:		Date:	

Tenderer Representative I			
Name:		Signature:	
Designation:		Date:	

Factory Representative I			
Name:		Signature:	
Designation:		Date:	

Annex E– Product assessment CHECKSHEET for LTCB Circuit-breakers

Eskom	**CIRCUIT-BREAKER CHECKSHEET (DESIGN REVIEW)**		
NOTE: This Checksheet must be completed using the Standard: 240-56030436. The deviations found shall be used for Annex D completion.			
Manufacturer			
Name			
Country			
Tenderer and Factory Representatives			
Tenderer rep			
Factory rep			
Circuit-Breaker			
Type:		Nominal Voltage:	
Current rating:		Breaking capacity (kA):	
Live/ Dead tank:		Number of series breaks:	
Closing Resistors/ Grading Capacitors			
Make & Type:		Voltage:	

Current rating:		Resistance/ Capacitance rating:	
Synchronous/ Controlled Switching Relay			
Make & Type:		Voltage:	
Operating Mechanism			
Manufacturer:		Number of mechanisms	
Type:		(Spring):	
Inspected By Eskom Evaluation Representative			
Name:		Signature:	
Designation:		Date:	

Sheet Number (X of Y): ____ of _____

Item No#	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
		Clause	Page	Comply?	
1					
2					
3					
4					
5					
6					

7					
8					
9					
10					
11					
12					
13					
14					

Inspected By Eskom Evaluation Representative			
Name:		Signature:	
Designation:		Date:	

CB Operating Mechanism			
Manufacturer:		Number of mechanisms	
Type:			

Item No#	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
		Clause	Page	Comply?	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Inspected By Eskom Evaluation Representative			
Name:		Signature:	
Designation:		Date:	

Annex F – Factory Evaluation Criteria (Technical Quality)

Section 1	
GENERAL INFORMATION	
Name of Supplier:	
Name of Manufacturer:	
Registered name and full street address of the factory at which the audit and inspection is done:	
Factory representatives:	
Name:	Position:
Name:	Position:
Name:	Position:
Name:	Position:
RECEIVING/GOODS INWARDS INSPECTION AND STORAGE	

Are materials, components and sub-assemblies verified by the factory as complying with the applicable requirements?	Yes	No
Comments:		
If the factory relies on certificates of conformity of test results from suppliers, do these clearly identify the products, specifications, quantity of items, dated and signed?	Yes	No
Comments:		
Are non-conforming products/components/materials clearly identified and segregated to prevent their use?	Yes	No
Comments:		
Are records of raw material received, kept/stored? In what format and for how long?	Yes	No
Comments:		
Is there a system in place to manage reception and allocation of raw materials?	Yes	No

Comments:		
PRODUCTION LINE INSPECTION AND ROUTINE TESTS		
Comments:		
ASSEMBLY: Do personnel have readily available up to date procedures, assembly instructions, photographs, drawings or reference samples?	Yes	No
Comments:		
PRODUCTION LINE TEST: Do personnel have readily available up to date procedures, work instructions and drawings related to the required testing to be carried out on the intermediate stage and the final product, related to conformance of the finished product?	Yes	No
Comments:		
Are the test results monitored for trends or recurrences and reported to production/quality management?	Yes	No

Comments:		
Are repaired and reworked products re-inspected in accordance with documented procedures?	Yes	No
Comments:		
Does the “Production line inspection” and the “Routine Tests” performed by the factory sufficiently cover all the applicable requirements?	Yes	No
Comments:		
Are personnel involved in the assembly and quality control, adequately briefed on their duties and competent to perform them?	Yes	No
Comments:		
CALIBRATION OF TEST EQUIPMENT AND TESTING FACILITY		
Is all equipment used for testing calibrated?	Yes	No

Comments:		
Is the equipment provided with a label, or similar method, indicating the date of the last calibration and the due date for the next calibration?	Yes	No
Comments:		
Are records from equipment calibrations appropriate and kept by the factory?	Yes	No
Comments:		
Do the records indicate that the calibration is traceable to National/International metrology standards?	Yes	No
Comments:		
Does the factory have the capability to carry out all the routine tests?	Yes	No
Comments:		

Do test reports identify the test specimen and are they properly singed and stored?	Yes	No
Comments:		
FACTORY CAPABILITY AND QUALITY MANAGEMENT SYSTEM		
Does the factory have a documented Quality Management System?	Yes	No
Comments:		
Does the factory regularly perform internal audits of its Quality Management System, and periodically check that all documented procedures, including those required for certification, are followed?	Yes	No
Comments:		
Are the records from internal audits and the corrective actions, where applicable, available and are they sufficiently detailed to demonstrate that the Quality Management System is effective?	Yes	No
Comments:		
COMPLAINTS/NON-CONFORMANCES		

Does the factory have a documented system for handling complaints?	Yes	No
Comments:		
Do the factory review complaints from customers or other stakeholders and take appropriate action?	Yes	No
Comments:		
Are records of the complaints and of the corrective actions taken kept?	Yes	No
Comments:		
CHANGE CONTROL		
Is there a documented procedure that covers control of products and production process changes?	Yes	No
Comments:		

Does the procedure cover the review and approval of product or production process changes by the responsible personnel/management?	Yes	No
Comments:		
Are there provisions to ensure that changes to the product construction are accepted by competent/authorise personnel?	Yes	No
Comments:		
Is there an up-to-date parts list or similar evidence available, specifying the components/parts to be used during production of the products?	Yes	No
Comments:		
DESIGN PRACTICES		
Are designs done in-house?	Yes	No
Comments:		
Does the company have design tools and guidelines?	Yes	No

Comments:		
Is there a design process workflow system?	Yes	No
Comments:		
Is there a documented process for verification and validation of designs?	Yes	No
Comments:		
Are new designs approved and verified by competent personnel?	Yes	No
Comments:		
Following final design approval, is there a process in place to link the new design to the manufacturing process?	Yes	No
Comments:		

FINDINGS
CONCLUSION
RECOMMENDATION(S)