

 Eskom	Standard	Technology
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Title: **TECHNICAL EVALUATION
CRITERIA FOR GAS INSULATED
SWITCHGEAR (GIS)
SUBSTATION EQUIPMENT AND
MIXED TECHNOLOGY
SWITCHGEAR (MTS)**

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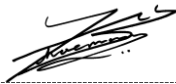
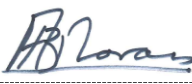


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Content

	Page
1. Introduction	3
2. Supporting Clauses	3
2.1 Scope	3
2.1.1 Purpose	3
2.1.2 Applicability	3
2.2 Normative/Informative References.....	3
2.2.1 Normative.....	3
2.2.2 Informative	4
2.3 Definitions.....	4
2.3.1 General	4
2.3.2 Disclosure Classification	5
2.4 Abbreviations.....	5
2.5 Roles and Responsibilities	5
2.6 Process for monitoring	6
2.7 Related/supporting documents	6
3. Document Content.....	6
3.1 Scope of work.....	6
3.2 Desktop evaluation.....	6
3.2.1 The successful tender submission which meets the threshold of 75%	7
3.3 Factory and product assessment (items that meet threshold for qualification).....	7
3.3.1 Factory assessment.....	7
3.3.2 Factory product assessment.....	8
3.4 Prior to awarding of the contract (shortlisted Suppliers/ Tenderers only)	8
3.5 Final product acceptance post contract award and closing out of deviations.....	9
4. Authorisation.....	9
5. Revisions	9
6. Development team	10
7. Acknowledgements	10
Annex A – GIS technical evaluation criteria for desktop exercise	11
Annex B – : Product assessment CHECKSHEET for GIS/ MTS – all parts.....	17
Annex C – : Product assessment CHECKSHEET for GIS/ MTS switching devices/ components	28
Annex D – Product assessment CHECKSHEET for GIS/ MTS disconnectors and Earth Switches.....	31
Annex E – : Factory Product Assessment EVALUATION Agreement	34

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 all Gas Insulated Switchgear (GIS) equipment and Mixed Technologies Switchgear (MTS) including circuit breakers, disconnectors, earthing switches, instrument transformers, bus bars, SF6 to air bushings 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.

This document contains the evaluation criteria that shall be used throughout the project life cycle. Eskom shall be responsible to complete Annex A and B or C as part of the Returnable.

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 GIS equipment and MTS including circuit breakers, disconnectors, earthing switches, instrument transformers, bus bars, SF6 to air bushings 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 GIS equipment and MTS including circuit breakers, disconnectors, earthing switches, instrument transformers, bus bars, SF6 to air bushings and equipment 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] SANS/ IEC 60050(441):1984: International Electro technical Vocabulary – Chapter 441: Switchgear, control gear and fuses
- [2] SANS/ IEC 62271-1, Common specifications for high voltage switchgear and control gear standards
- [3] 240-56065202, Switchgear training requirements from Original Equipment Manufacturers Standard.
- [4] ISO 9001 Quality Management Systems.
- [5] 240-50807380, Specification for Gas Insulated Switchgear (GIS) and Associated Auxiliary Equipment.
- [6] SANS/ IEC 62271-203 Gas insulated metal enclosed switchgear for rated voltages above 50kV

2.2.2 Informative

- [7] 32-1034, Eskom procurement and supply management procedure
- [8] 240-59030436, Distribution Groups Specific Requirements for 132kV Mixed Technology Gas Insulated Switchgear Standard
- [9] 240-94136452, Specification for the design of substation GIS buildings
- [10] 240-50807380, Specification for Gas Insulated Switchgear (GIS) and associated auxiliary equipment
- [11] 32-1034, Eskom procurement and supply management procedure
- [12] 240-95399672, Substation Engineering Technical Tender Evaluation Report – GIS Building

2.3 Definitions

2.3.1 General

Definition	Description
Circuit-breaker	The mechanical switching device that is capable of making, carrying and breaking the normal currents, and also 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.)
Dead-tank circuit-breaker	[IEV 441-14-25 definition] [2] A circuit-breaker with interrupters in an earthed metal tank
Disconnecter	[IEV 441-14-05 definition] [2] The mechanical switching device which provides, in the open position, the isolating distance in accordance with the specified requirements. Note: A disconnector is capable of opening and closing the circuit when neither negligible current is broken or made, or when no significant change of voltage across the terminals of each of the poles of the disconnector occurs. It is also capable of carrying current under normal circuit conditions or carrying for a specified time current under abnormal conditions such as those of short-circuit.
Earthing switch	[IEV 441-14-11 definition] [2] The mechanical switching device for earthing parts of the circuit, capable of withstanding for a specified time currents under abnormal conditions such as those of short-circuit, but not required to carry current under normal conditions of the circuit. Note: An earthing switch may have the short-circuit making capacity.
Overall Functionality Threshold/ Overall Minimum Threshold for Qualification	This is the threshold that has been determined by Eskom which includes SHE, Quality and Technical, which the submission must meet in order to proceed with the technical evaluation after scoring stage.
SF6 circuit-breaker	[IEV 441-14-29 definition] [2] A circuit-breaker in which the contacts open and close in sulphur hexafluoride.
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.

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
CG	Care Group
CT	Current transformer
DS	Disconnecter
DTCB	Dead-tank circuit-breaker
Dx	Distribution
ES	Earthing switch
Eskom	Eskom Holdings SOC (Ltd)
GA	General Arrangement
GIS	Gas Insulated Switchgear
LCC	Local Control Cubicle
MT-GIS	Mixed Technology-Gas Insulated Switchgear
MTS	Mixed Technology Switchgear
OEM	Original Equipment Manufacturer
OU	Operating Unit
PDE	Power Delivery Engineering
PTM&C	Protection Measurement & Control
RAM	Reliability, Availability, Maintainability
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Quotation
SCOT	Steering Committee of Technology
SF6	Sulphur Hexafluoride
VT	Voltage transformer
WG	Work Group

2.5 Roles and Responsibilities

PDE HV Plant – Compiles this document with inputs from the SCOT Care Groups and Working Groups (HV & EHV GIS/MTS CG, GIS WG and AIS CG) and Substation Engineering, PTM&C and Research. 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.

Project Management – Make use of the up to date version of this document during commercial processes.

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Grids, OU's, Quality Management, Logistics Management and PDE HV Plant – Make reference to this document and the technical specification during switchgear asset life expectancy.

Technical evaluator – Implement the contents of this document applicable to equipment covered by its scope. Technical evaluation report shall be compiled for Eskom purposes that indicates and refers to the clauses of this document.

2.6 Process for monitoring

Not applicable.

2.7 Related/supporting documents

Not applicable

3. Document Content

This document contains the technical evaluation criteria and associated documents for GIS substation equipment and MTS including circuit breakers, disconnectors, earthing switches, instrument transformers, bus bars, bushings and equipment training. The technical evaluation criteria are specific to each of the equipment.

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 GIS or MTS installation 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 Annex for each switchgear item required (refer to Annex A to Annex E).

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:-

- a) Completed Technical A & B schedules
- b) Type test reports
- c) Drawings
- d) Operation and Maintenance Instruction Manuals
- e) GIS Service continuity of availability in relation to substation design (This is part of condition of contract awarding)

Note a.): If the above 5 returnables are not available on each technical submission of that particular item tendered for, that technical submission is disqualified.

Note b.1): The completed Technical A&B schedules of the GIS equipment or MTS, the GIS Building and the Individual components (i.e. circuit-breaker, disconnector, instrument transformer, bushing, surge arrestors and secondary plant).. All the completed Technical A&B schedules shall be submitted in the following 3 formats:-

Paper printed, Adobe PDF & The original electronic format it was issued by Eskom

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%.

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

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3.2.1 The successful tender submission which meets the threshold of 75%

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

- a) The list of technical deviations shall be compiled.

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) The Supplier(s)/ Tenderer(s) of the item that meet technical threshold for qualification threshold may be subjected to – Factory assessment and Product assessment which amongst others, includes raising the technical deviations that form part of the Objective or Discretionary requirements.

3.3 Factory and product assessment (items that meet threshold for qualification)

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 Group Commercial. The subsequent selection of the suppliers and factories to be visited shall be upon Eskom discretion after all evaluation criteria was taken into consideration by Eskom.

The purpose of the factory visit is to perform the factory assessment, to assess the capability of the factory to deliver the requirements. The factory product assessment 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 Assessment Check sheets for all findings, and these shall be raised with the Supplier and Factory Representatives and recorded under the Evaluation Agreement (Annex I). An Eskom confidential report will be produced for these assessments. This will be taken into account for the technical evaluation.

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

3.3.1 Factory assessment

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
- Manufacturing of selected components or sub-assemblies
- Discussion of detail requirements (Service continuity (SANS:IEC 62271-203 Annex F) and availability, extensions, replacement, etc.)
- Factory Performance (including the On Time Delivery (OTD) and Factory Failure Rate (FFR))

3.3.2 Factory product assessment

The Tenderer whose submission has been selected shall be subjected to the factory product assessment.

At the factory, the technical evaluators shall verify the type test records kept. Furthermore, the Eskom technical evaluators shall conduct an assessment of the product(s) through the use of check sheets (Annexes B, C and D) and Evaluation Agreement document (Annex E). The check sheets are used to compare the compliance of the Eskom standard to the tender submissions. Any deviations to be raised with the Tenderer and factory and all those deviations that were found by Eskom during Desktop evaluation shall be listed on the Evaluation Agreement document (Annex E) and signed-off.

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

3.3.2.1 Objective or discretionary requirements

The Eskom technical evaluators shall raise all the technical deviations that form part of the Objective or Discretionary requirements with the Supplier/ Tenderer. These shall be listed on the Evaluation agreement (Annex E) document where all parties shall sign-off.

The Final technical evaluation report will be compiled taking into account the Desktop report and the factory and product assessment which includes the Objective or Discretionary requirements.

3.4 Prior to awarding of the contract (shortlisted Suppliers/ Tenderers only)

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

- Closing of the technical deviations
- Training
- Final design of the Controlled switching devices and/or Online condition monitoring devices
- Optional digital secondary plant interface (where applicable)
- GIS performance verification
- Final design of the Online condition monitoring devices – arc flash detection & online PD monitoring
- Integration of the substation onsite work
- GIS Service continuity of availability in relation to substation design (SANA/IEC 62271-203 annex f)
Are the arrangements of gas sections or compartments such that it is possible to extend and replace existing bus bars or circuits, replace faulted items and perform maintenance without having to take out of service more than one bus bar or adjacent circuits at any one time throughout the entire service life?
- Alignment of the GIS or MTS to the out of scope outdoor AIS yard details of the main earthing terminal and operating mechanism enclosure earthing terminal
- Final building design verification and discussion
- Spares and maintenance policy

3.5 Final product acceptance post contract award and closing out of deviations

3.5.1.1 Finalisation of the design/ pre-construction 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 control and protection drawings (LCC, Breaker Marshalling Kiosk and where applicable the optional digital secondary plant interface) and GIS buildings
- The details of training levels rollout strategy
- Spares ordering

3.5.1.2 Factory Acceptance Tests and witnessing of Routine testing (manufacturing)

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.

3.5.1.3 Inspection of the first off installations and final closing out of deviations

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

4. Authorisation

This document has been seen and accepted by:

Name and surname	Designation
Bheki Ntshangase	Senior Manager HV Plant
Andre Marais	HV & EHV GIS & Mixed Technology Switchgear Care Group Convener
Sphiwe Nkosi	Chief Engineer PDE, HVP
Frik Schoeman	Senior Technologist PDE, HVP, GIS
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5. Revisions

Date	Rev	Compiler	Remarks
July 2018	3	F Schoeman	Final authorised version
Sept 2015	2	S Nkosi	Official approved version Review the following clauses:- 3.2.1 – Updated the paragraph on scoring Annex A – Updated scoring Annex B – Updated scoring

Date	Rev	Compiler	Remarks
May 2015	1	S Nkosi	Official approved version Alignment with the GIS and MTS projects requirements New official document compiled in-order to have the standard documented evaluation criteria for the equipment and discipline it covers.

6. Development team

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

- Sphiwe Nkosi Group Technology – PDE HV Plant
- Andre Marais Group Technology – PDE HV Plant
- Jayandra Haridas Group Technology – PDE Integration
- Frik Schoeman Group Technology – PDE HV Plant

7. Acknowledgements

The author acknowledges the input from the members of the HV & EHV GIS and Mixed Technology Switchgear Care Group, the GIS Work Group, PDE Substation Engineering, PDE PTM&C, PDE Integration and Transmission (Research Test & Development).

Annex A – GIS technical evaluation criteria for desktop exercise

1	STAGE 1- BASIC COMPLIANCE: TENDER DELIVERABLES AND MANDATORY TECHNICAL REQUIREMENTS FOR GIS			
Item	Description of technical requirement		Yes / No	Eskom assessment
a)	The completed Technical A&B schedules (of the GIS Schedule circuit-breaker, Controlled switching device (Point on Wave relay) and Optional digital secondary plant interface.)			
b)	List of type test reports (The copies of the type- test reports)			
c)	Drawings and constructional features • The general arrangement outline drawing (for each offered circuit-breaker type)			
	• Wiring diagrams (Electrical secondary wiring schematics (NOTE: This shall include the wiring schematics of the offered controlled switching device, condition monitoring device and Optional digital interface)			
	• Rating / Name plates			
d)	Operation and Maintenance Instruction Manuals			
e)	GIS Service continuity of availability in relation to substation design (SANA/IEC 62271-203 annex f)			
	NB : FAILURE TO SUBMIT THE TENDER RETURNABLES IN STAGE 1 ABOVE SHALL RENDER THE TENDERER NON-RESPONSIVE AND WILL BE DISQUALIFIED FOR FURTHER EVALUATION			
2	SCORING AGAINST CRITERIA FOR EVALUATION – STAGE 2 (Total = 100 %, threshold for qualification = 75 %)			
Item	Description of technical requirement	Met	Weight	Score
a)	Rated values and characteristics NB: If one requirement is not met 22 % is automatically deducted		26 %	
General	Layout design: As per specified Station Electric Diagram State gas filling connections (Dilo) The arrangement of gas sections or compartments shall be such that it is possible to extend and replace existing bus bars or circuits, replace faulted items and perform maintenance without having to take out of service more than one bus bar or adjacent circuits at any one time Buffer compartments installed to reduce outage time and details indicated in gas schematic diagram Gas schematic diagram indicating the amount of gas in each compartment per phase in kilogram The relative leakage rate to the SF6 gas compartment must not exceed 0.5% per annum. The frequency value for the time between replenishment shall be at least 10 years			

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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**
Unique Identifier: **240-87340147**Revision: **3**Page: **12 of 34**

	<p>Maximum fault level for 1 sec (kA)</p> <p>Switching impulse withstand voltage (250/2500µs) referred to sea level</p> <ul style="list-style-type: none"> To earth and across open switching device position (kV) <p>Lightning impulse withstand voltage (1.2/50µs) referred to sea level</p> <ul style="list-style-type: none"> To earth (kV) <p>Seismic Activity</p> <p>Continuous circuit current (A)</p> <p>Continuous short circuit fault current for 1 sec (kA)</p> <p>Creepage distance equivalent based on 550 kV (mm/kV)</p> <p>GIS connection to transformer and reactor bushings</p> <p>Switching impulse withstand voltage (kV)</p> <p>Lightning impulse withstand voltage (kV)</p> <p>Cantilever withstand force (N)</p> <p>Ratings: Continuous circuit current (kA)</p> <p>Continuous short circuit fault current for 1 sec (kA)</p> <p>Corrosion specification</p>			
Circuit Breaker	<p>Mechanism Operation Type</p> <p>Rated voltage (Ur) (kV)</p> <p>Rated short-duration power-frequency withstand voltage (Ud) (kV)</p> <p>Rated peak lightning impulse withstand voltage (Up) (kV)</p> <p>Rated frequency (fr) (Hz)</p> <p>Rated normal current (Ir) - main circuit (A)</p> <p>Rated short-time withstand current (Ik and Ike) (kA)</p> <p>Rated peak withstand current (Ip and Ipe) (kA)</p> <p>Rated d.c. supply voltage of closing and opening devices and of auxiliary and control circuits (Ua) (V)</p>			
Current Transformer	<p>Nominal system voltage (kV)</p> <p>Maximum system voltage (kV)</p> <p>Rated frequency (Hz)</p> <p>Nominal primary current (A)</p> <p>Short time thermal current (kA)</p> <p>Rated Switching Impulse (kV)</p> <p>Rated Lightning Impulse (kV)</p>			
Voltage Transformer	<p>Rated frequency (Hz)</p> <p>System neutral</p> <p>Rated r.m.s. line-to-line voltage (kV)</p> <p>Maximum continuous r.m.s. line-to-line voltage (kV)</p> <p>Minimum crest value of full wave lightning impulse type test withstand voltage to earth at sea level on HV terminal (kV)</p>			

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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**
Unique Identifier: **240-87340147**Revision: **3**Page: **13 of 34**

	Characteristic of impulse wave (μ s) Minimum crest value of full wave switching impulse type test withstand voltage to earth at sea level on HV terminal (kV) Characteristic of impulse wave (μ s)			
Surge Arrester	Nominal system voltage (U_n). (kV) Maximum system voltage (U_m). (kV) Basic insulation level of equipment to be protected $kV_{(peak)}$ Frequency of supply (Hz) Arrester steep-current impulse residual voltage with 10 kA discharge current with front time of 1 μ s (not greater than). $kV_{(peak)}$ Lightning impulse (1,2/50 μ s) withstand level $kV_{(rms)}$ Switching impulse (250/2500 μ s) withstand level $kV_{(peak)}$			
Disconnecter	Rated voltage (U_r) (kV) Rated normal current (I_r) (A) Rated short-time withstand current (I_k) (kA) Rated peak withstand current (I_p) (kA) Rated short-duration power frequency withstand voltage (kV) Rated lightning impulse withstand voltage (kV) Across the isolating distance (LIWL) (kV) Motor voltage (Vdc)			
Earth Switch	Rated voltage (U_r) ((kV) Rated short-time withstand current (I_k) (kA) Rated peak withstand current (I_p) (kA) Motor voltage (Vdc) Insulation test voltage To earth and between phases in the open position (kV) Across the isolating distance (kV) Power frequency wet withstand voltage (60 second) referred to sea level <ul style="list-style-type: none"> To earth and between phases in the open position (kV) Across the isolating distance (kV) Switching impulse withstand voltage ((250/2500 μ s) referred to sea level <ul style="list-style-type: none"> To earth and across open switching device position (kV) Between phases in the open position 			
b)	Type test reports (NB: type tests for GIS) NB: If one requirement is not met 22 % is automatically deducted		26 %	
	Has the GIS been type-tested to SANS/ IEC 62271-1 and SANS/ IEC 62271-203 standard? Proof of compliance must be submitted of the following type-tests:-.			

**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **14 of 34**

	<p>a) Tests to verify the insulation level of the equipment and the dielectric tests on auxiliary circuits; (SANS/IEC 62271-203 clause 6.2)</p> <ul style="list-style-type: none"> • Power frequency withstand voltage test (PFWL) • Lightning Impulse withstand voltage test (peak) (LIWL) • Rated Switching Impulse withstand voltage (peak) (SIWL) (applicable to $U_r \geq 300$ kV) <p>b) Test to prove temperature rise of any part of the equipment and the measurement of the resistance main circuit</p> <ul style="list-style-type: none"> • Measurement of the resistance main circuit (SANS 62271-100 clause 6.4); • Temperature rise tests (SANS 62271-100 clause 6.5)/ (Rated continuous current test) <p>c.) Tests to prove the rated peak and the short time withstand current</p> <ul style="list-style-type: none"> • Short time withstand current and peak withstand current tests (SANS 62271-203 clauses 6.6); • Short-circuit current making and breaking test duties (SANS 62271-100 clauses 6.102 to 6.106) <p>d) Tests to verify the making and breaking capacity of the included switching devices</p> <ul style="list-style-type: none"> • (SANS/IEC 62271-203 Clause 6.101) <p>e) Tests to prove the satisfactory operation of the included switching devices</p> <ul style="list-style-type: none"> • Mechanical operational and environmental tests (SANS 62271-100 clause 6.101.2.1 to 6.101.2.3) • Operating and mechanical endurance tests (SANS 62271-203 clause 6.102) <p>f) Tests to prove the strength of the enclosures</p> <ul style="list-style-type: none"> • (SANS/IEC 62271-203 Clause 6.103) <p>g) Gas tightness tests</p> <ul style="list-style-type: none"> • SF6 tightness tests (SANS/IEC 62271-203 clause 6.8) <p>h) Tests on partitions</p> <p>(SANS/IEC 62271-203 Clause 6.104)</p>			
	<p>NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.</p>			
	<p><u>The Supplier/ Tenderer shall provide the following or the written commitments to perform these tests subject to contract award:-</u></p> <p>a) Verification of the degree of protection</p>			

**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**
Unique Identifier: **240-87340147**Revision: **3**Page: **15 of 34**

	(SANS/IEC 62271-203 clause 6.7); b) Test under conditions of arcing due to internal fault (SANS/IEC 62271-203 clause 105) c) Mechanical endurance tests (as specified by Eskom on the Technical Schedule section A) d) X-ray tests on insulators (User requirement) e) Partial discharge test (SANS/IEC 62271-203 clause 6.2.9) f) Electro Magnetic Compatibility (EMC) Test (SANS/IEC 62271-203 clause 6.9) g) Radio Interference Voltage (RIV) test (SANS/IEC 62271-203 clause 6.3) (If Applicable) h) Dielectric test on auxiliary circuits (SANS/IEC 62271-203 clause 6.2)			
c)	Drawings and constructional features (GA outline drawing)(Detailed drawings of all components) NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.		7 %	
	Drawing number Detailed description provided in "Title". Overall dimensions Supporting structure and mounting points Main HV terminal details SF6 Gas Schematics Electrical clearances: – to earth; between open contacts; between poles			
	Wiring diagrams (NB: including the wiring of CT's and where applicable, Controlled switching device (Point on Wave relay) NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.		6 %	
	Drawing number Detailed description provided in "Title" Details of secondary terminals			
	Rating / Name plates NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.		4 %	
	Name of manufacturer Type designation and serial number Technical rating details			
d)	Manuals and requested information (operation & maintenance) NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.		8 %	

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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **16 of 34**

	<ul style="list-style-type: none"> Manuals submitted in both hardcopy & Electronic copy and in written in English. Following topics covered:- <ul style="list-style-type: none"> Transport, storage, installation, operation instruction and maintenance <p>(To be provided in hard copy and electronic format)</p>			
	Training Standard compliance NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.		6 %	
	NOTE: Refer to, Standard: 240-56065202 – Switchgear training requirements from Original Equipment Manufacturers. <ul style="list-style-type: none"> Taking into account the Eskom specified Levels of training Commitment by supplier to provide training 			
	Reliability, Availability, Maintainability (RAM) programme manual NB: The score will be the ratio of the successfully met over the total number of items listed here-under, then multiplied by the weight.		8 %	
	NOTE: Refer to, Standard: 240-50807380 – GIS Specification clause 11.16 <ul style="list-style-type: none"> Has the RAM programme manual been submitted Are the three aspects addressed as per Eskom request 			
e)	GIS Service continuity of availability in relation to substation design (SANA/IEC 62271-203 Annex f) Are the arrangements of gas sections or compartments such that it is possible to extend and replace existing bus bars or circuits, replace faulted items and perform maintenance without having to take out of service more than one bus bar or adjacent circuits at any one time throughout the entire service life?		9 %	
	Subtotal			
	Grand total		100 %	

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Annex B – : Product assessment CHECKSHEET for GIS/ MTS – all parts

		GIS/ MTS CHECKSHEET (DESIGN REVIEW)	
Note: This Check sheet must be completed using the GIS Standard: 240-50807380 or MTS Standard: 240-59030436. The deviations found shall be used for Annex E completion.			
Manufacturer			
Name		Country	
Tenderer and Factory Representatives			
Tenderer rep			
Factory rep			
Metal Enclosed Equipment			
Type:		Nominal Voltage:	
Current rating:		Rated Power Frequency Withstand Voltage (PFWL)	
Rated short-circuit current (kA):		Rated Switching Impulse withstand voltage (SIWL)	
Max Operating pressure:		Rated Lightning Impulse Withstand voltage (LIWL):	

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **18 of 34**

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Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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Current Transformers			
Type:		Nominal Voltage:	
Nominal primary current rating (A):		Nominal short-time thermal rating (kA):	

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **20 of 34**

Voltage Transformers			
Type:		Nominal Voltage:	
Electromagnetic type:		Separate gas compartment:	

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EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **21 of 34**

Busbar Conductors			
Type:		Nominal Voltage:	
Continuous circuit Current rating:		Short circuit fault current for 3 sec:	

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EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **22 of 34**

SF6 / Air bushings & connections to Transformers and Reactors			
Type:		Nominal Voltage:	
Nominal primary current rating (A):		Nominal short-time thermal rating (kA):	

Item No#	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **23 of 34**

Connections to Transformers and Reactors			
Voltage:		Removable bus link:	
Nominal primary current rating (A):		Nominal short-time thermal rating (kA):	
Flexible connections:			

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **24 of 34**

HV & EHV Cable Connections			
Type:		Nominal Voltage:	
Nominal primary current rating (A):		Nominal short-time thermal rating (kA):	
Testing facility:			

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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Surge Arrestors			
Type:		Nominal Voltage:	
Normal discharge current:		Basic insulation level of equipment to be protected. (kVpeak)	

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Structural Support Steelwork and Associated Fittings			
Type:		Technical details:	

Item	Items Inspected and findings made	Details on CB Standard			Eskom comments
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General

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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **27 of 34**

Special tools:		Nameplates (corrosion resistant, indicate actual ratings, English, mounted)	
Gas handling device:		Identification labels, high and with of lettering:	
Colour of equipment, panels, cubicles and terminal boxes:		Interchangeability of parts:	


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Annex C – : Product assessment CHECKSHEET for GIS/ MTS switching devices/ components

	CIRCUIT BREAKER CHECKSHEET (DESIGN REVIEW)		
<p>NOTE: This Check sheet must be completed using the GIS Standard: 240-50807380 or MTS Standard: 240-59030436. The deviations found shall be used for Annex E completion.</p>			
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/ rating:	Capacitance
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 ____			

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INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **29 of 34**

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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Designation:		Date:	

CB Operating Mechanism

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INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **30 of 34**

Manufacturer:		Number of mechanisms	
Type:			


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Designation:		Date:	

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Annex D – Product assessment CHECKSHEET for GIS/ MTS disconnectors and Earth Switches

		DISCONNECTOR/ EARTHING SWITCHES CHECKSHEET (DESIGN REVIEW)	
<p>NOTE: This Check sheet must be completed using the GIS Standard: 240-50807380 or MTS Standard: 240-240-59030436. The deviations found shall be used for Annex E completion.</p>			
Manufacturer:			
Name			
Country			
Tenderer and Factory Representatives			
Tenderer rep			
Factory rep			
Disconnecter			
Type:		Voltage:	
Amp rating:		kA rating:	
Operating Mechanism			
Manufacturer:		Motor Voltage:	
Type:		Motor current:	
Hand or Motor Drive	Motor		
Inspected By Eskom Evaluation Representative			
Name:		Signature:	
Designation:		Date:	

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**TECHNICAL EVALUATION CRITERIA FOR GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
EQUIPMENT AND MIXED TECHNOLOGY SWITCHGEAR
(MTS)**

Unique Identifier: **240-87340147**Revision: **3**Page: **32 of 34**

Sheet Number (X of Y): ____ of ____

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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Disconnecter & Earthing switch Operating Mechanism

Manufacturer:		Number of mechanisms	
Type:		Facilities for manual operation:	

Item	Items Inspected and findings made	Details on Eskom Standard			Eskom comments
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Annex E – : Factory Product Assessment 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:	

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