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|  Eskom | Standard | Technology |
|--|-----------------|-------------------|

Title: **TECHNICAL EVALUATION
CRITERIA FOR GAS INSULATED
SUBSTATION EQUIPMENT AND
MIXED TECHNOLOGY
SWITCHGEAR**

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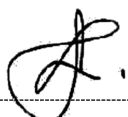


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1. Introduction

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, Gas Insulated 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, B, C or D 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, instrument transformers, bus bars, gas insulated 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, gas insulated 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] ISO 9001 Quality Management Systems.
- [4] SANS/ IEC 62271-203 Gas insulated metal enclosed switchgear for rated voltages above 50kV

2.2.2 Informative

- [5] 32-1034, Eskom procurement and supply chain management procedure
- [6] WKoe11P01-SE-D53, Functional specification for the design and construction of the 400/132kV GIS and control building at Koeberg
- [7] 240-50807380, Specification for Gas Insulated Switchgear (GIS) and associated auxiliary equipment
- [8] 240-134369472 Substation Earth Grid Design Standard
- [9] 240-124520996 – Switchgear training requirements from Original Equipment Manufacturers
- [10] 240-146288697- Specification for the interfacing of the new Protection and Control equipment to the Gas Insulated Substations Bay marshalling kiosk.
- [11] 0.52-30571 – Wiring diagram for the Bay Marshalling kiosk

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

Asset management, SED HV Plant – Compiles this document with inputs from the SCOT Care Groups and Working Groups (HV & EHV GIS/MTS CG, GIS WG, AIS CG), Substation Engineering, PTM&C and Research. It is their responsibility to maintain this document and keep it 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 – Refer 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, DTCB, instrument transformers, bus bars, bushings and equipment training. The technical evaluation criteria are specific to each of the equipment mentioned above.

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, building of the GIS or MTS installation and the providing of technical training (Basic and intermediate).

3.2 Process Starting Phase

A complete project specific Supplier Tender Package is to be compiled by the project task team and the appointed buyer is to ensure that this package is made available to the market.

All interested Suppliers shall be invited to attend the Compulsory Project Clarification meeting upon Tender issued to the market on Tender Bulletin. The purpose of this Clarification meeting is to provide a transparent platform for all interested suppliers to obtain clarity on any aspect or item which they may have regarding the tender in question. At no point during this discussion, may any expectation be set with any Supplier. Eskom will explain the technical evaluation criteria requirements and the Eskom technical specification.

3.3 Desktop evaluation

This evaluation exercise is performed by the Eskom technical evaluators once Commercial Department has released the documentation received from the supplier which qualified against their set criteria. This technical part of the evaluation starts when the submissions are opened for the first time by this Eskom Technical evaluation team. This process of evaluation is started off with the Mandatory criteria Stage 1.

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 Returnable 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)

- f) An accurate and traceable list of reference(s), supported by satisfied client letters confirming the successful completion of design, manufacture, factory testing, supply, delivery, off-loading, installation, pre-commissioning testing and commissioning must be provided. References must also include the successful construction of GIS building(s). (Reference applicable to the voltage level(s) as indicated in this tender)

Note

- If any of the above Six (6) Returnables is not available on each technical submission of that particular item tendered for, that technical submission is disqualified.
- The completed Technical A&B schedules for the GIS or MTS equipment, GIS Building and the Individual components (i.e. circuit-breaker, disconnector, instrument transformer, bushing, surge arrestors and secondary plant) shall be submitted in the following three (3) formats: –
 1. Paper printed (Physical Technical File of the Tender,
 2. Adobe PDF (Soft Copy)
 3. The original electronic format in which it was issued by Eskom

No format or chronological sequence changes on the returnable tender documents are allowed.

Failing to adhere to this will lead to tender to be deemed non-responsive.

Only the tender submission that has complied with the Stage 1 requirement shall be taken through to Stage 2 of the Desktop evaluation which refers to Annex A of this document. The full scoring that the technical submission can score under Stage 2 is 100%. The technical threshold for qualification is 75%, and only suppliers meeting these criteria shall be considered for further evaluation.

Any technical submission that scored below 75% is disqualified from any further evaluation.

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

The Eskom technical evaluators shall:

- a) Compile a list of technical deviations which could not be resolved and verified during the Stage 2 evaluation.

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

- b) These qualifying Suppliers will be subjected to – Factory assessment and Product assessment which amongst others, includes resolving and reaching consensus regarding the technical deviations that form part of the Objective or Discretionary requirements.

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

The Eskom confidential Desktop evaluation report which indicates the technical submission items that were evaluated and those that met the technical threshold for qualification will be used to compile a shortlist of Factories to be visited for evaluation purposes.

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 (Annex B – D) for all findings, and these shall be raised with the Supplier and Factory Representatives and recorded under the Factory/Product Evaluation discussion (Annex E). An Eskom confidential report will be produced for these assessments. This will be taken into account for the final evaluation report.

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 and to ensure the technical compliance with the Eskom requirements as specified.

If the Product or Factory does not meet Eskom's requirements during the factory visit, the Tenderer will be disqualified.

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3.4.1 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))

3.4.2 Factory product assessment

The Tenderer whose submission has been short listed shall be subjected to the factory / product evaluation.

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 Factory/Product Evaluation discussion (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 the Desktop evaluation shall be listed on the Factory/Product Evaluation discussion document (Annex E) and signed-off.

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

If the Product or Factory does not meet Eskom's requirements during the factory visit, the Tenderer will be disqualified.

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

The technical evaluation team confirm in their report, which of the visited tenderers comply with the technical requirements as was requested. Eskom Tender Committee studies the composite report (Technical, Procurement, Treasury, SD&L, etc.). Eskom reserves the right to compile a shortlist of Suppliers / Tenderers based on the outcome of these reports.

The technical evaluators shall meet with the top ranked shortlisted Supplier / Tenderer prior to awarding of the contract. The following shall be discussed in detail with this shortlisted Suppliers: -

- 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

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- 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?
- Discussion and agreement on Factory acceptance and site commissioning testing to be performed, testing protocols, test equipment to be used, format of test results and test plans to be supplied by supplier.
- 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

If agreement on all the above points has been reached, the process will advance to the Final product acceptance post contract award and closing out of deviations. If not, the technical evaluators shall meet with the next ranked shortlisted Supplier agreement.

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

3.6.1 Finalisation of the design/ pre-construction review (pre-manufacturing)

The following technical issues 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

3.6.2 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 their designed functionality witnessed.

3.6.3 Inspection of the first installations and final closing out of deviations

All outstanding deviations and/ or factors that the Supplier/ Tenderer agreed to rectify as per the signed Factory/Product Evaluation discussion 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 SED |
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| Name and surname | Designation |
|------------------|---------------------------------|
| Jayandra Haridas | Senior Technologist Integration |

5. Revisions

| Date | Rev | Compiler | Remarks |
|-----------|-----|------------|--|
| Sept 2022 | 5 | F Schoeman | Sixth mandatory returnable was added under 3.3 |
| May 2019 | 4 | F Schoeman | Added Number reference to Annexures and Added process flowchart. Reference to Local Control Marshalling Kiosks implemented |
| 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 |
| 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 – SED HV Plant
- Jayandra Haridas Group Technology – SED Integration
- Frik Schoeman Group Technology – SED HV Plant
- Raymond Dolly HV Plant Eastern Grid
- Quinten Nepgen HV Plant Northeast Grid

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, SED Substation Engineering, SED PTM&C, SED Integration and Transmission (Research Test & Development).

Annex A – GIS technical evaluation criteria for desktop exercise

| STAGE 1 - BASIC COMPLIANCE: TENDER DELIVERABLES AND MANDATORY TECHNICAL REQUIREMENTS FOR GIS | | | | |
|---|--|-----|---------------|------------------|
| Item | Description of technical requirement | | Yes / No | Eskom assessment |
| 1.1 | 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.) | | | |
| 1.2 | List of type test reports (The copies of the type-test reports) | | | |
| 1.3 | Drawings and constructional features • The general arrangement outline drawing (for offered equipment 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) 0.52-30571 | | | |
| | • Rating / Name plates | | | |
| 1.4 | Operation and Maintenance Instruction Manuals | | | |
| 1.5 | GIS Service continuity of availability in relation to substation design (SANS/IEC 62271-203 annex f) | | | |
| 1.6 | An accurate and traceable list of reference(s), supported by satisfied client letters confirming the successful completion of design, manufacture, factory testing, supply, delivery, off-loading, installation, pre-commissioning testing and commissioning must be provided. References must also include the successful construction of GIS building(s). (Reference applicable to the voltage level(s) as indicated in this tender) | | | |
| | NB : FAILURE TO SUBMIT ALL THE TENDER RETURNABLES IN STAGE 1 ABOVE SHALL RENDER THE TENDERER NON-RESPONSIVE AND WILL BE DISQUALIFIED FOR FURTHER EVALUATION | | | |
| STAGE 2 - SCORING AGAINST CRITERIA FOR EVALUATION (Total = 100 %, threshold for qualification = 75 %) | | | | |
| Item | Description of technical requirement | | | |
| 1. | Rated Values and Characteristics | Met | Weight | Score |
| | NB: If one requirement listed below and market with an (*) is not met 26% is automatically deducted | | 26 % | |

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| | | | | |
|---------------------|---|--|--|--|
| 1.1 General | <p>*1.1.1 Layout design: As per specified Station Electric Diagram</p> <p>1.1.2 State gas filling connections (Dilo)</p> <p>*1.1.3 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</p> <p>*1.1.4 Buffer compartments installed to reduce outage time and details indicated in gas schematic diagram</p> <p>*1.1.5 Gas schematic diagram indicating the amount of gas in each compartment per phase in kilogram</p> <p>*1.1.6 The relative leakage rate to the Insulation gas compartment must not exceed 0.5% per annum.</p> <p>*1.1.7 Maximum fault level for 1 sec (kA)</p> <p>*1.1.8 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>1.1.9 Lightning impulse withstand voltage (1.2/50µs) referred to sea level</p> <ul style="list-style-type: none"> • To earth (kV) <p>*1.1.10 Seismic Activity</p> <p>*1.1.11 Continuous circuit current (A)</p> <p>*1.1.12 Continuous short circuit fault current for 1 sec (kA)</p> <p>1.1.13 Creepage distance equivalent based on 550 kV (mm/kV)</p> <p>1.1.14 GIS connection to transformer and reactor bushings</p> <p>*1.1.16 Switching impulse withstand voltage (kV)</p> <p>*1.1.17 Lightning impulse withstand voltage (kV)</p> <p>1.1.18 Cantilever withstand force (N)</p> <p>*1.1.19 Corrosion specification</p> | | | |
| 1.2 Circuit Breaker | <p>*1.2.1 Mechanism Operation Type</p> <p>1.2.2 Rated voltage (Ur) (kV)</p> <p>1.2.3 Rated short-duration power-frequency withstand voltage (Ud) (kV)</p> <p>1.2.4 Rated peak lightning impulse withstand voltage (Up) (kV)</p> <p>1.2.5 Rated frequency (fr) (Hz)</p> <p>1.2.6 Rated normal current (Ir) - main circuit (A)</p> <p>1.2.7 Rated short time withstand current (Ik and Ike) (kA)</p> <p>1.2.8 Rated peak withstand current (Ip and Ipe) (kA)</p> <p>1.2.9 Rated DC. supply voltage of closing and opening devices and of auxiliary and control circuits (Ua) (V)</p> | | | |


| | | | | |
|--------------------------------|---|--|--|--|
| 1.3 Current Transformer | 1.3.1 Nominal system voltage (kV) 1.3.2 Maximum system voltage (kV) 1.3.3 Rated frequency (Hz) 1.3.4 Nominal primary current (A) 1.3.5 Short time thermal current (kA) 1.3.6 Rated Switching Impulse (kV) 1.3.7 Rated Lightning Impulse (kV) | | | |
| 1.4 Voltage Transformer | 1.4.1 Rated frequency (Hz) 1.4.2 System neutral 1.4.3 Rated r.m.s. line-to-line voltage (kV) 1.4.4 Maximum continuous r.m.s. line-to-line voltage (kV) 1.4.5 Minimum crest value of full wave lightning impulse type test withstand voltage to earth at sea level on HV terminal (kV) 1.4.6 Characteristic of impulse wave (μ s) 1.4.7 Minimum crest value of full wave switching impulse type test withstand voltage to earth at sea level on HV terminal (kV) 1.4.8 Characteristic of impulse wave (μ s) | | | |
| 1.5 Surge Arrester | 1.5.1 Nominal system voltage (U_n). (kV) 1.5.2 Maximum system voltage (U_m). (kV) 1.5.3 Basic insulation level of equipment to be protected $kV_{(peak)}$ 1.5.4 Frequency of supply (Hz) 1.5.5 Arrester steep-current impulse residual voltage with 10 kA discharge current with front time of 1 μ s (not greater than). $kV_{(peak)}$ 1.5.6 Lightning impulse (1,2/50 μ s) withstand level $kV_{(rms)}$ 1.5.7 Switching impulse (250/2500 μ s) withstand level $kV_{(peak)}$ | | | |
| 1.6 Disconnecter | 1.6.1 Rated voltage (U_r) (kV) 1.6.2 Rated normal current (I_r) (A) 1.6.3 Rated short time withstand current (I_k) (kA) 1.6.4 Rated peak withstand current (I_p) (kA) 1.6.5 Rated short-duration power frequency withstand voltage (kV) 1.6.6 Rated lightning impulse withstand voltage (kV) 1.6.7 Across the isolating distance (LIWL) (kV) 1.6.8 Motor voltage (Vdc) | | | |
| 1.7 Earth Switch | 1.7.1 Rated voltage (U_r) ((kV) 1.7.2 Rated short time withstand current (I_k) (kA) 1.7.3 Rated peak withstand current (I_p) (kA) 1.7.4 Motor voltage (Vdc) 1.7.5 Insulation test voltage <ul style="list-style-type: none"> To earth and between phases in the open position (kV) | | | |

| | | | | |
|----|---|-----|---------------|-------|
| | <ul style="list-style-type: none"> Across the isolating distance (kV) <p>1.7.6 Power frequency withstand voltage (60 second) referred to sea level</p> <ul style="list-style-type: none"> To earth and between phases in the open position (kV) Across the isolating distance (kV) <p>1.7.7 Switching impulse withstand voltage ((250/2500 μs) referred to sea level</p> <ul style="list-style-type: none"> To earth and across open switching device position (kV) Between phases in the open position | | | |
| 2. | Type test reports (NB: type tests for GIS) | Met | Weight | Score |
| | NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | | 26 % | |
| | <p>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: -.</p> <p>2.1 Tests to verify the insulation level of the equipment and the dielectric tests on auxiliary circuits: (SANS/IEC 62271-203 clause 6.2)</p> <p>2.1.1 Power frequency withstand voltage test (PFWL)</p> <p>2.1.2 Lightning Impulse withstand voltage test (peak) (LIWL)</p> <p>2.1.3 Rated Switching Impulse withstand voltage (peak) (SIWL) (applicable to $U_r \geq 300$ kV)</p> <p>2.2 Test to prove temperature rise of any part of the equipment and the measurement of the resistance main circuit</p> <p>2.2.1 Measurement of the resistance main circuit (SANS 62271-100 clause 6.4).</p> <p>2.2.2 Temperature rise tests (SANS 62271-100 clause 6.5)/ (Rated continuous current test)</p> <p>2.3 Tests to prove the rated peak and the short time withstand current</p> <p>2.3.1 Short time withstand current, and peak withstand current tests (SANS 62271-203 clauses 6.6).</p> <p>2.3.2 Short-circuit current making and breaking test duties (SANS 62271-100 clauses 6.102 to 6.106)</p> <p>2.4 Tests to verify the making and breaking capacity of the included switching devices</p> <p>2.4.1 (SANS/IEC 62271-203 Clause 6.101)</p> <p>2.5 Tests to prove the satisfactory operation of the included switching devices</p> <p>2.5.1 Mechanical operational and environmental tests (SANS 62271-100 clause 6.101.2.1 to 6.101.2.3)</p> <p>2.5.2 Operating and mechanical endurance tests (SANS 62271-203 clause 6.102)</p> | | | |

| | | | | |
|----|---|-----|---------------|-------|
| | 2.6 Tests to prove the strength of the enclosures 2.6.1 (SANS/IEC 62271-203 Clause 6.103) 2.7 Gas tightness tests 2.7.1 Insulation gas tightness tests (SANS/IEC 62271-203 clause 6.8) 2.8 Tests on partitions 2.8.1. (SANS/IEC 62271-203 Clause 6.104) | | | |
| 3. | The Supplier/ Tenderer shall provide the following or the written commitments to perform these tests subject to contract award: - NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | Met | Weight 8% | Score |
| | 3.1 Verification of the degree of protection (SANS/IEC 62271-203 clause 6.7). 3.2 Test under conditions of arcing due to internal fault (SANS/IEC 62271-203 clause 105) 3.3 Mechanical endurance tests (as specified by Eskom on the Technical Schedule section A) 3.4 X-ray tests on insulators (User requirement) 3.5 Partial discharge test (SANS/IEC 62271-203 clause 6.2.9) 3.6 Electro Magnetic Compatibility (EMC) Test (SANS/IEC 62271-203 clause 6.9) 3.7 Radio Interference Voltage (RIV) test (SANS/IEC 62271-203 clause 6.3) (If Applicable) 3.8 Dielectric test on auxiliary circuits (SANS/IEC 62271-203 clause 6.2) | | | |
| 4. | 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, multiplied by the weight. | Met | Weight 7 % | Score |
| | 4.1 Drawing number 4.2 Detailed description provided in "Title". 4.3 Overall dimensions 4.4 Supporting structure and mounting points 4.5 Main HV terminal details 4.6 SF6 Gas Schematics 4.7 Electrical clearances: – to earth; between open contacts; between poles | | | |

| | | | | |
|----|---|-----|--------|-------|
| 5. | Wiring diagrams (NB: including the wiring of CT's and where applicable, Controlled switching device (Point on Wave relay) | Met | Weight | Score |
| | NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | | 6 % | |
| | 5.1 Drawing number 5.2 Detailed description provided in "Title" 5.3 Details of secondary terminals as per 0.52-30571 | | | |
| 6. | Rating / Name plates | Met | Weight | Score |
| | NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | | 6 % | |
| | 6.1 Name of manufacturer 6.2 Type designation and serial number 6.3 Technical rating details | | | |
| 7. | Manuals and requested information (operation & maintenance) | Met | Weight | Score |
| | NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | | 10 % | |
| | 7.1 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 • maintenance (To be provided in hard copy and electronic format) | | | |
| 8. | Training Standard compliance | Met | Weight | Score |
| | NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | | 5 % | |
| | NOTE: Refer to, Standard: 240-124520996 – Switchgear training requirements from Original Equipment Manufacturers. <ul style="list-style-type: none"> • Commitment by supplier to provide training taking into account the Eskom specified Levels of training | | | |
| 9. | Reliability, Availability, Maintainability (RAM) programme manual | Met | Weight | Score |
| | NB: The score will be the ratio of the successfully met over the total number of items listed here-under, multiplied by the weight. | | 6 % | |
| | 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 | | | |
| | Subtotal | | | |
| | Grand total | | 100 % | |

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 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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| Sheet Number (X of Y): ____ of ____ | | | | | |
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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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| Voltage Transformers | | | |
|-----------------------|--|---------------------------|--|
| Type: | | Nominal Voltage: | |
| Electromagnetic type: | | Separate gas compartment: | |

| Item | Items Inspected and findings made | Details on Eskom Standard | | | Eskom comments |
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| Busbar Conductors | | | |
|------------------------------------|--|--|--|
| Type: | | Nominal Voltage: | |
| Continuous circuit Current rating: | | Short circuit fault current for 3 sec: | |

| Item | Items Inspected and findings made | Details on Eskom Standard | | | Eskom comments |
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| SF6 / Air bushings & connections to Transformers and Reactors | | | |
|---|--|---|--|
| 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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| 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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| 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. (kV peak) | |

| Item | Items Inspected and findings made | Details on Eskom Standard | | | Eskom comments |
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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 | | | |
|---|--|---|--|
| 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: | |


| Item | Items Inspected and findings made | Details on Eskom Standard | | | Eskom comments |
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**Annex C – Product assessment CHECKSHEET for GIS/ MTS switching
devices/ components**

| | | | |
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|  | | CIRCUIT BREAKER 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 | | | |
| 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: | |
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Sheet Number (X of Y): ____ of ____

| Item | Items Inspected and findings made | Details on Eskom Standard | | | Eskom comments |
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CB Operating Mechanism

| | | | |
|----------------------|--|-----------------------------|--|
| Manufacturer: | | Number of mechanisms | |
| Type: | | | |

| Item | Items Inspected and findings made | Details on Eskom Standard | | | Eskom comments |
|-------------|--|----------------------------------|-------------|----------------|-----------------------|
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**Annex D – Product assessment CHECKSHEET for GIS/ MTS disconnectors
and Earth Switches**

| | | | |
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|  | | DISCONNECTOR/ EARTHING SWITCHES CHECKSHEET (DESIGN REVIEW) | |
| NOTE: This Check sheet must be completed using the GIS Standard: 240-50807380. The deviations found shall be used for Annex E completion. | | | |
| 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 Operated | | Motor Drive | |
| | | | |
| Inspected By Eskom Evaluation Representative | | | |
| Name: | | Signature: | |
| Designation: | | Date: | |

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to ensure it is in line with the authorized version on the WEB.

Sheet Number (X of Y): ____ of ____

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

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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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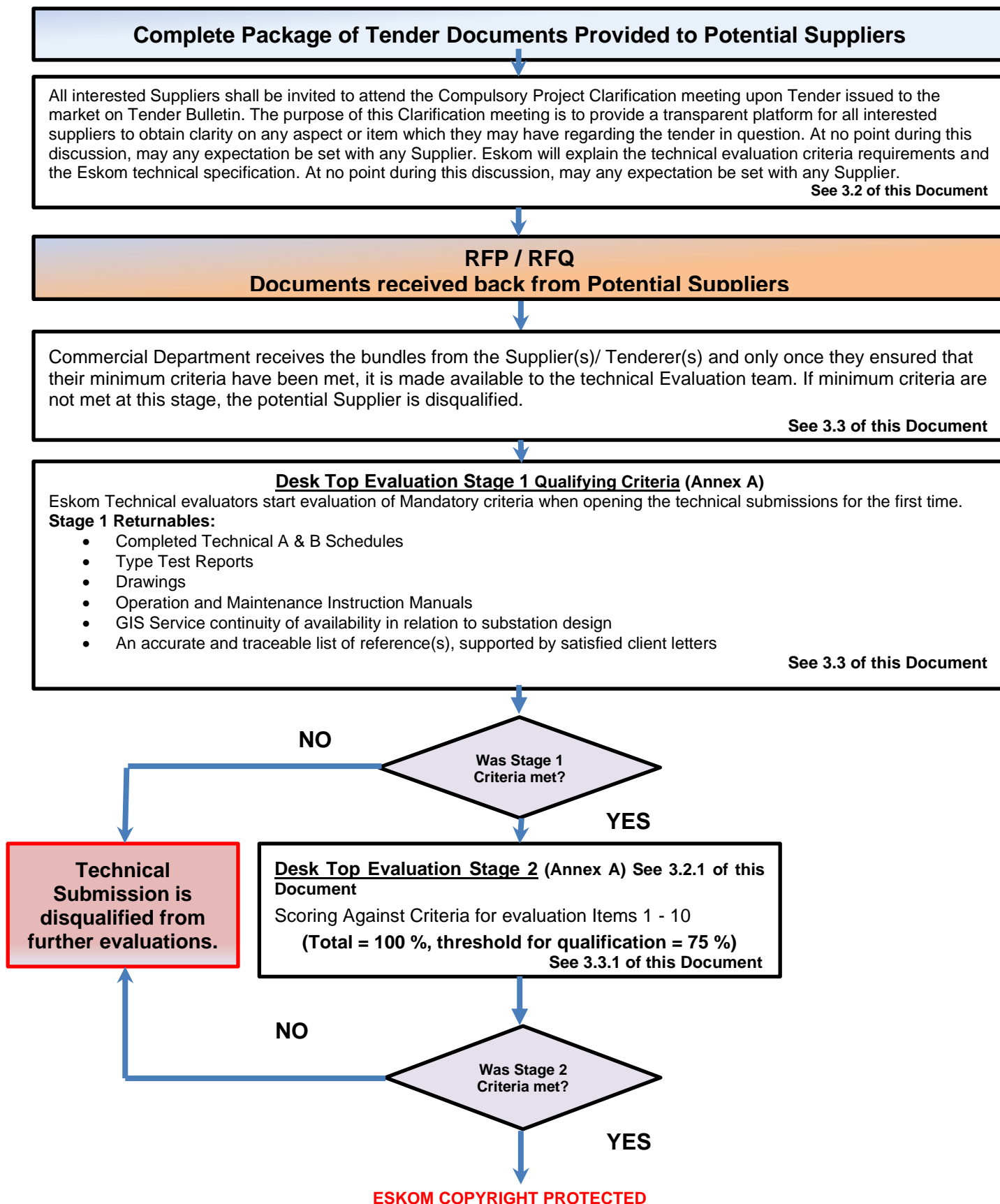
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| Designation: | | Date: | |

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Annex F – Technical Evaluation Criteria Flow Diagram



Utilizing the outcome of Stage 2 evaluation, the Eskom Technical Evaluators compile a report. This report indicate the Final Desk Top results, factories to be visited and also include all Technical deviations which still needs to be resolved during the factory visit. **See 3.4 of this Document**

Commercial (Commodity Sourcing) will draft a letter to each factory to be visited.
Criteria to be verified is to be shared with these factories

During this visit, the delivery capability of the factory, if the product meets all the technical requirements and product assessment are evaluated and documented on Annex B - D.
All technical deviations will be discussed and documented on Annex E during the visit. After consensus has been reached, Annex E will be signed off by all parties. **See 3.4.2 of this Document**

The technical evaluators compile a final confidential report in order to confirm the technical compliance of the qualified potential suppliers **See 3.5 of this Document**

Prior to contract awarding:
Eskom studies the composite report and compile the final short list of potential suppliers/tenderers. **See 3.5 of this Document**

The Technical Evaluators is to meet with the potential supplier and finalize all issues as specified in this documented. **See 3.4 of this Document**

NO

Was consensus
reached?

YES

The last process is the final product acceptance post contract award and closing out of deviations. This includes:

- Finalisation of the design/pre-construction review
- Factory acceptance tests and witnessing of Routine testing
- Inspection of the first installations and final closing out of deviations.

See 3.6.1 to 3.6.3 of this Document

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