

	Technical Evaluation	Technology
---	----------------------	------------

Title: **TECHNICAL EVALUATION
CRITERIA FOR MINIATURE
SUBSTATIONS**

Alternative Reference Number: **<n/a>**

Area of Applicability: **Engineering**

Documentation Type: **Report**

Revision: **1**

Total Pages: **32**

Next Review Date: **N/A**

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 National document(s).....	3
2.2.2 Eskom document(s).....	4
2.2.3 Informative.....	5
2.3 Definitions.....	5
2.3.1 General.....	5
2.3.2 Disclosure classification.....	6
2.4 Abbreviations.....	6
2.5 Roles and responsibilities.....	6
2.6 Process for monitoring.....	6
2.7 Related/supporting documents.....	6
3. Requirements.....	6
3.1 Documentation Evaluation.....	7
3.2 Factory Evaluation.....	8
3.3 Factory Sample Evaluation.....	10
3.4 Technical Evaluation Criteria For The Documentation Evaluation Stage.....	11
3.4.1 Level 1 mandatory technical evaluation requirements for Type A mini subs:.....	11
3.4.2 Technical evaluation criteria Type A Mini Subs – Level 2 score.....	14
3.5 Technical Evaluation Gate Keepers for all Type B Mini.....	16
3.5.1 Technical Evaluation Criteria applicable to all Type B Mini Sub types: Mandatory Technical Evaluation Requirements.....	16
3.5.2 Technical evaluation criteria for Type B Mini Subs – Level 2 score.....	21
3.6 Technical Evaluation Gate Keepers for RMU (Type B mini subs only).....	24
3.6.1 Technical Evaluation Criteria for RMU: Mandatory Technical Evaluation Requirements...24	
3.6.2 Technical evaluation criteria for RMU – Level 2 score.....	25
3.7 Technical Evaluation Gate Keepers for IRTU (for IRTU fitted Type B mini subs only).....	29
3.7.1 Technical Evaluation Criteria for IRTU: Mandatory Technical Evaluation Requirements...29	
3.7.2 Technical evaluation criteria for IRTU – Level 2 score.....	31
3.8 Conclusion.....	31
4. Revisions.....	32
5. Acknowledgements.....	32

1. Introduction

This document has been developed to set the standard technical evaluation criteria to be used when evaluating tender submissions for mini substations used in Eskom. These mini substation product range types will include Type A mini subs, Type B mini subs, Type B high risk mini subs, Type B mini subs fitted with IRTUs, Type B high risk mini subs fitted with IRTUs and all related components per type used. The technical evaluation criteria have clauses developed to address various aspects required to perform the technical evaluation. It has been developed in line with the Eskom mini substation equipment specifications.

This document contains both the evaluation criteria used for the documentation evaluation, factory evaluations and factory sample evaluations. In addition it contains the questions which are required for technical evaluation purposes.

2. Supporting clauses

2.1 Scope

The document covers the criteria for the evaluation of the mini substations within Eskom Holdings SOC Limited (Ltd).

2.1.1 Purpose

The document addresses the standard documented technical evaluation criteria to be used when evaluating the tender submissions for the mini substations in line with the Eskom Holdings SOC Limited (Ltd) requirements and it is applicable to all stages of the technical evaluations for the related tender submissions.

2.1.2 Applicability

This document shall apply for the Eskom Holdings SOC Limited, Distribution and Transmission division wherein Eskom has a controlling interest, and Generation division where required.

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 National document(s)

- [1] SANS 1029, Mini-substations for rated A.C voltages up to and including 24 kV.
- [2] SANS 1874, Switchgear — Metal-enclosed ring main units for rated a.c. voltages above 1 kV and up to and including 36 kV.
- [3] SANS 876, Cable terminations and live conductors within air-filled enclosures (insulation coordination) for rated a.c. voltages from 7.2 kV and up to and including 36 kV.
- [4] SANS 1332, Accessories for medium-voltage power cables (3,8/6,6 kV to 19/33 kV).
- [5] SANS 121 / ISO 1461, Hot-dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods.
- [6] SANS 1019, Standard voltages, currents and insulation levels for electricity supply.
- [7] SANS 1091, National colour standard.
- [8] SANS 60076-7, Power transformers – Part 7: Loading guide for oil-immersed power transformers.
- [9] SANS 60269-2 / IEC 60269-2, Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to I.
- [10] SANS 60529, Degrees of protection provided by enclosures (IP Code).

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 4 of 32

-
- [11] SANS 60815-1, Selection and dimensioning of high-voltage insulators intended for use in polluted conditions – Part 1: Definitions, information and general principles.
 - [12] SANS 60947-3 /IEC 60947-3, Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units.
 - [13] SANS 61243-5, Live working – Voltage detectors – Part 5: Voltage detecting systems (VDS).
 - [14] SANS 61439-1, Low-voltage switchgear and controlgear assemblies – Part 1: General rules.
 - [15] SANS 780, Distribution transformers.
 - [16] SANS 62271-202, High-voltage switchgear and controlgear - Part 202: High-voltage/low-voltage prefabricated substation.
 - [17] SANS 62271-200, High-voltage switchgear and control gear - Part 200: AC metal-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV.

2.2.2 Eskom document(s)

- [18] 240-56062752: Specification for medium voltage miniature substations for systems with nominal voltages of 3.3 kV, 6.6 kV, 11 kV and 22 kV standard.
- [19] 240-70413291 (DSP 34-253): Specification for electrical terminal blocks.
- [20] 240-56364491 (DST 34-462): Standard design for distribution protection schemes.
- [21] 240-75655480 (DSP 34-1080): Specification for earth fault indicators used for MV cable networks.
- [22] 240-75655504 (DSP 34-1658): Corrosion protection specification for distribution outdoor equipment manufactured from steel.
- [23] 240-97690165: Tele-control requirements for ring main units.
- [24] 240-64685228 (DST 34-333): Generic Specification for Protective Intelligent Electronic Devices (IEDS).
- [25] 240-56030406 (DSP 34-210): Ring main units for systems with nominal voltages from 11 kV to 33 kV.
- [26] 240-56065202: Switchgear Training Requirements from Original Equipment Manufacturers Standard.
- [27] 240-57648800: New oil filled auxiliary transformers rated 1 MVA and below and 33 kV and below.
- [28] D-DT-0853: 11 kV air-insulated cable junction box detail (Type A mini-sub).
- [29] D-DT-0859: Type B mini-substation plinth details.
- [30] D-DT-0860: 11 kV and 22 kV Type A mini-sub cable termination detail.
- [31] D-DT-0868: Schematic and wiring diagram.
- [32] D-DT-1013: Mini-sub meter plate details.
- [33] D-DT-3034: LV circuit breakers.
- [34] D-DT-3088: Distribution transformer LV neutral surge arrester.
- [35] D-DT-3132: Wire, meter sealing s/steel.
- [36] D-DT-3181: LV fuses.
- [37] D-DT-3409: Fuse holder, vertical 3P 440V.
- [38] D-DT-3196: Ferrule, tinned Cu sealing 12mm LG.
- [39] D-DT-3202: Danger sign (unauthorised entry prohibited).
- [40] D-DT-6073: Signs D & E (Treatment and Full First Aid Instructions).

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 5 of 32

- [41] D-DT-8016: Unscreened separable connectors (11kV).
- [42] D-DT-8017: Screened separable connectors (22kV).
- [43] D-DT-8019: Cable Clamp (black polypropylene).
- [44] D-DT-8026: LV flexible cables.
- [45] D-DT-8029: Sealant strip for mini-sub/ RMU.
- [46] D-DT-8050: Mini-substation 11 kV, Type B.
- [47] D-DT-8051: Mini-substation 22 kV, Type B.
- [48] D-DT-8052: Mini-substation 11 kV, Type A.
- [49] D-DT-8053: Mini-substation 22 kV, Type A

2.2.3 Informative

- [50] 32-9: Definition of Eskom documents.
- [51] 32-644: Eskom documentation management standard.
- [52] 474-65: Operating manual of the Steering Committee of Technologies (SCOT).

2.3 Definitions

2.3.1 General

Definition	Description
Eskom Evaluating Representative(s)	The person(s) appointed by Eskom to perform the evaluation of tender submission(s) in line with the Eskom requirements.
Nominal voltage	The stated r.m.s. phase-to-phase voltage of the supply to which equipment is connected.
Rated voltage	The highest r.m.s. phase-to-phase voltage of the supply for which equipment is designed to operate continuously.
Ring main unit	A medium voltage metal-enclosed switchgear assembly that comprises a combination of two ring switch-disconnectors and a circuit-breaker tee-off function. These functions incorporate integral cable earthing switches and have facilities for cable testing.
Type A mini-sub	A mini-sub that is fitted with an off-load, dead-break isolating arrangement in the MV compartment, that consists of extensible screened separable connectors at 11 kV and 22 kV.
Type B mini-sub	A mini-sub that is equipped with a ring main unit in the MV compartment.
IRTU fitted Type B mini-sub	A miniature substation that is equipped with a ring main unit in the MV compartment and an IRTU control system.
IRTU	Integrated remote terminal unit that is fitted in or on the mini substation enclosure in accordance with requirements of 240-97690165 (Tele-control requirements for ring main units) and powered from the mini substation transformer.
High risk Type B mini-sub	A miniature substation that is equipped with a ring main unit in the MV compartment and a high risk enclosure design.

ESKOM COPYRIGHT PROTECTED

2.3.2 Disclosure classification

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

2.4 Abbreviations

Abbreviation	Description
IRTU	Integrated Remote Terminal Unit
LV	Low Voltage
MCCB	Moulded Case Circuit Breaker
Mini-sub	Miniature Substation
MV	Medium Voltage
OEM	Original Equipment Manufacturer
PECU	Photo-Electric Control Unit
RMU	Ring Main Unit
RTU	Remote Terminal Unit
SHEQ	Safety, Health, Environmental and Quality

2.5 Roles and responsibilities

All Eskom employees and/or appointed bodies involved in the procurement of the mini-substations shall ensure that the project deliverable meets the requirements of these technical evaluation criteria. Any deviation from these requirements shall constitute non-conformance, unless it was in advance agreed to by a delegated Cable Systems Specialist and is based on sound engineering judgement.

All suppliers of mini-substations to Eskom must be conversant with the requirements of the applicable standards, and shall comply with the requirements. No deviations will be accepted and suppliers shall ensure that they obtain clarity where required and obtain all supporting information or documents necessary to comply with this document.

2.6 Process for monitoring

The acceptance of the mini-substations shall be based on the evaluation of the fully compliant documentation submission, factory evaluations and the exact replica factory sample evaluations for each mini substation product, product type and its associated main components.

2.7 Related/supporting documents

Refer to clause/ section 2.2.

3. Requirements

This document contains the technical evaluation criteria for all type mini-substations. The three stages of the technical evaluation criteria are specific to each of the mini-sub types and its associated main components evaluated. The evaluation methodology will include three main stages, namely the documentation evaluation, factory evaluations and factory sample evaluations.

3.1 Documentation Evaluation

The documentation evaluation exercise is performed by the Eskom evaluating representatives. This initial part of the evaluation starts when technical submissions are opened and assessed for the first time after the SHEQ evaluations were concluded, unless otherwise agreed. Only SHEQ compliant submissions shall be considered for technical evaluations to conclude the tender process, any evaluation of non SHEQ compliant tenderers will be at the discretion of Eskom. The submitted documents will be evaluated against the evaluation criteria as stated in clause 3.3, 3.4, 3.5, 3.6 and 3.7 of this document.

Failure to submit all documents required and failure to comply with the documentation formats will lead to immediate disqualification.

During the documentation evaluation; the submission need to proof the full compliance and type testing for the mini subs were done in accordance with Eskom specifications and normative references where applicable, or will be done where permitted in accordance with the evaluation criteria. Failure to submit and comply with all test requirements specified in the Eskom specifications or the related normative referenced documents will lead to immediate disqualification, unless otherwise indicated by Eskom.

The supply of individual mini sub rated items will only be allowed once all applicable tests are completed and compliant. Where permitted to perform tests as part of contract award, all related testing costs will be for the suppliers account, and will require to be witnessed by suitable Eskom technical representatives. In-house transformer testing will only be considered if it can be proven during documentation and factory evaluations that the test laboratory is compliant and calibrated for the tests to be performed, and were or will be witnessed by a suitable Eskom technical representative. Failure to prove in-house testing facility compliance for specific transformer tests, will be default imply that the manufacturer need to perform the applicable tests at an accredited local or international test facility.

The documentation evaluations are meant for establishing if all the key tender deliverables are met with regard to the product offered. The documentation evaluation will be performed in two levels: 1) the mandatory technical evaluation requirements and deliverables (Level 1: mandatory gate-keeper), and 2) the scoring phase (level 2: submission requirements).

The Level 1 mandatory gate-keeper constitute a total of 80% of the technical evaluation documentation score, while the level 2 submission requirements constitute 20% of the technical evaluation documentation score. If all stages of the complete technical evaluation (i.e. documentation, factory and factory sample evaluations) were successfully completed and found compliant per product range offered, the technical evaluation documentation score achieved will by default be the final technical evaluation score outcome.

The documentation tender submission must meet all the level 1 gate-keeper mandatory technical evaluation requirements. Failure to meet all the mandatory requirements will result to a score of 0% achieved for the 80% scoring weight allowed and immediate disqualification; thus a tenderer can only obtain 0% or 80%, and nothing in between for level 1 mandatory gate-keeper requirements. Equation 1 shows how the technical evaluation score will be calculated.

Technical evaluation score = 80% (level 1 mandatory gate-keeper requirements) + 20% (level 2 submission requirements) (1)

Immediate disqualification during the level 1 gate-keepers mandatory technical evaluation stage will mean that Eskom will be allowed to stop the technical evaluations without concluding the review of all the level 1 gate-keeper mandatory technical evaluation requirements not yet reviewed. Any further review of the level 1 gate-keeper mandatory technical evaluation requirements will be at the discretion of Eskom.

Note: Only a 100% combined score achieved for the level 1 mandatory gate-keeper requirements and the level 2 scoring phase will proof 100% product compliance. If all level 1 requirements are met and a final combined score lower than 100% is achieved. The tenderer will be required to ensure all non-compliant aspects are met as part of possible contract award.

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**Revision: **1**Page: **8 of 32**

Evaluation for the RMUs, IRTU's, LV interconnection cables, MV interconnection cables, MV cable terminations (SSC's) and the LV switchgear used in the mini substation shall be performed as part of the mini substation technical evaluations. If more than one product option is offered for the above, a full technical submission (i.e. technical documentation in accordance with the Eskom specification, manufacturing plant location and the complete mini substation samples fitted with the different options) will be required for each option offered, including the detailed cost breakdown. The submitted documents for the RMU and IRTU fitted Mini sub RMU will be specifically evaluated against the technical evaluation criteria as stated in clause 3.5 and 3.6. The gate keeper requirements stated in the paragraphs above will apply for the RMUs and IRTU fitted Mini sub RMU as well.

The level 2 scoring weight allocation will be performed in accordance with table 1 below for all Type B mini subs.

Table 1 : Level 2 Scoring weight allocation for all Type B mini subs

Type B/ High Risk Type B mini sub		Type B IRTU Fitted/ Type B high Risk IRTU Fitted mini sub	
Clause	Weight	Clause	Weight
3.5.2 Technical evaluation criteria for Type B Mini Subs – Level 2 score	15	3.5.2 Technical evaluation criteria for Type B Mini Subs – Level 2 score	12
3.6.2 Technical evaluation criteria for RMU – Level 2 score	5	3.6.2 Technical evaluation criteria for RMU – Level 2 score	4
3.7.2 Technical evaluation criteria for IRTU – Level 2 score	0	3.7.2 Technical evaluation criteria for IRTU – Level 2 score	4
Total	20	Total	20

3.2 Factory Evaluation

The factory evaluations are only performed on the submissions that have met all the documentation mandatory technical evaluation requirements in level 1, in accordance with this document. Eskom Commercial shall make the arrangements for factory visits and ensure the companies are notified and the technical representatives are invited on time.

At the factory, the Eskom evaluating representative(s) conducts the evaluation through the use of checklists. The checklists are used to verify factory capability and manufacturing method compliance to the type tested mini substation offered.

The factory evaluations will be performed at the following main component manufacturing plants and at the final assembly manufacturing plants for Type A mini subs:

- 1) The mini substation enclosure manufacturing,
- 2) The mini substation enclosure painting/ protective coating application,
- 3) The transformer manufacturing,
- 4) The bushing manufacturing for the transformer,
- 5) LV assembly manufacturing,

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 9 of 32

- 6) LV switchgear manufacturing,
- 7) The LV interconnection cable manufacturing,
- 8) The MV interconnection cable manufacturing,
- 9) The mini substation final assembly, and
- 10) Testing facilities including certification and calibration of testing equipment.

The factory evaluations will be performed at the following main component manufacturing plants and at the final assembly manufacturing plants for Type B mini subs, Type B high risk mini subs, Type B mini subs fitted with IRTUs, Type B high risk mini subs fitted with IRTUs:

- 1) The mini substation enclosure manufacturing,
- 2) The mini substation enclosure painting/ protective coating application,
- 3) The transformer manufacturing,
- 4) The bushing manufacturing for the transformer,
- 5) LV assembly manufacturing,
- 6) The Type B mini subs RMU manufacturing,
- 7) The Type B mini subs IRTU and all sub systems manufacturing,
- 8) The Type B mini subs RMU fitted CT's manufacturing,
- 9) The Type B mini subs RMU fitted bushing manufacturing,
- 10) The Type B mini subs RMU fitted Vacuum Interrupter manufacturing,
- 11) LV switchgear manufacturing,
- 12) The LV interconnection cable manufacturing,
- 13) The MV interconnection cable manufacturing,
- 14) The MV cable terminations (SSC's) manufacturing,
- 15) The Type B mini subs relay manufacturing, and
- 16) The mini substation final assembly.
- 17) Testing facilities including certification and calibration of testing equipment.

The manufacturing and assembly plant evaluation for the main components and final assembly will include the assessment of the following:

- 1) The product and manufacturing design and design software capability.
- 2) The manufacturing plant setup.
- 3) The machinery capability.
- 4) Raw material and compounds type tested.
- 5) Production process and critical check points.
- 6) Material handling and storage.
- 7) Testing facilities including certification and calibration of testing equipment.
- 8) Sample testing and procedures.
- 9) Routine testing and procedures.
- 10) Final packaging of materials.

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 10 of 32

At the end of the factory evaluation, the Eskom evaluating representative(s) list all the deviations and identified risks if any. The representative conducts a formal discussion of the deviations and risks in line with Eskom's requirements. If major discrepancies and risks are identified the supplier may be disqualified. For minor discrepancies and risks the Tenderer and their OEM are given an opportunity during possible contract negotiations to confirm that they will meet the Eskom requirements as part of possible contract award. The action plans for resolving the discrepancies and risks will be agreed between Eskom representative(s) and the supplier during possible contract negotiations, and will include any documentation and factory sample technical evaluation shortcomings.

3.3 Factory Sample Evaluation

The factory sample evaluations will be the evaluation of the exact replica product that is offered to Eskom during tender. A product range sample quantity allowance will be made by Eskom whereby each tenderer is required to prepare only one exact replica sample per product range type offered for factory sample evaluations. The mini substation main product range types will be; Type A, Type B, High Risk Type B, and Type B with an IRTU fitted Mini sub RMU. For each RMU and IRTU fitted Mini sub RMU OEM type variation offered, an additional exact replica sample shall be prepared by the tenderer on all of the product range types offered. The variations for the inland and coastal requirements, transformer kVA rating, voltage ranges and cable termination enclosure clamp arrangements will be evaluated as part of the factory evaluations.

The factory sample evaluations are only performed on the submissions that have met all the documentation mandatory technical evaluation requirements in level 1 and were found compliant for the factory evaluations concluded, in accordance with this document.

It is required that the tenderer ensure that the required exact replica samples in accordance with the Eskom mini substation specification and technical evaluation criteria are manufactured, assembled, functionally tested and ready for evaluation within five months after Eskom notified the tenderer that Eskom will proceed with factory evaluations and factory sample evaluations. The Eskom notification will include a list of the product ranges that was successful to advance to the factory evaluations and factory sample evaluations stages.

The costs for the exact replica sample manufacturing will be for the tenderers own cost. Should the tenderer be found compliant during the factory evaluations and factory sample evaluations, and was successful during the possible contract negotiations and awarding, the manufactured sample units may be corrected accordingly and supplied on contract when required.

Eskom Commercial shall make the necessary arrangements for the exact replica factory sample evaluations, by ensuring the companies are notified and the technical representatives are invited on time.

The exact replica factory sample evaluations shall be performed at the mini substation final assembly factory in South Africa.

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 11 of 32

3.4 Technical Evaluation Criteria For The Documentation Evaluation Stage
3.4.1 Level 1 mandatory technical evaluation requirements for Type A mini subs:

Type A Mini Sub technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is a detailed covering letter containing a list of items offered submitted?		
Is a full list of the manufacturing locations for the offered and if applicable type tested mini sub types and main components provided for the following: 1) The mini substation enclosure manufacturing, 2) The mini substation enclosure painting/ protective coating application, 3) The transformer manufacturing, 4) The bushing manufacturing for the transformer, 5) LV assembly manufacturing, 6) The LV interconnection cable manufacturing, 7) The MV interconnection cable manufacturing, 8) LV switchgear manufacturing, and 9) The mini substation final assembly.		
Is a full list, as well as the complete English copies of all transformer designs (including the bushings, core, insulation paper and insulation oil material OEM descriptions), design technical schedules, testing reports formats and testing schedule proposals for all transformer individual kVA and voltage ratings offered submitted, and compliant to the Eskom and normative referenced specification requirements? Or Is a full list, as well as the complete English copies of all transformer designs (including the bushings, core, insulation paper and insulation oil material OEM descriptions), design technical schedules, completed test reports for all transformer individual kVA and voltage ratings offered submitted, and compliant to the Eskom and normative referenced specification requirements? Notes: 1) The supply of individual mini sub rated items will only be allowed once all applicable tests are completed and compliant. 2) All tests performed as part of contract award will be for the cost of the supplier and require to be witnessed by suitable Eskom technical representatives. 3) In-house testing will only be considered if proof can be submitted and shown during documentation and factory evaluations that the test laboratory is compliant and calibrated for the tests to be performed, and were or will be witnessed by a suitable Eskom technical representative.	240-56062752 Clause 1, Clause 3.1.2.2, Clause 3.6 & Clause 3.7	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 12 of 32

Type A Mini Sub technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Are the tests schedule summaries submitted electronically in the provided excel format and in a printed pdf format for each item range offered?	240-56062752 Clause 3.8.2.1	
Is the mini sub manufactured in accordance with SANS 1029 and 240-56062752?	240-56062752 Clause 3.1	
Are the completed technical schedules B electronically submitted in the provided excel format and in a printed pdf format for each item offered?	Technical Schedules A and B	
Are completed technical schedules B signed and printed in hardcopy for each item offered?	Technical Schedules A and B	
Are the mini substation general assembly drawings submitted?	240-56062752 Clause 3.8.2.2a)	
Are mini substation key dimensions provided on the general assembly drawings submitted?	240-56062752 Clause 3.8.2.2	
Has type testing been performed at an accredited Test facility where applicable?	240-56062752 Clause 3.6.1g) & 3.7	
Is the mini sub and main components (LV cable and MCCB) type testing requirements met in accordance with the Eskom and SANS requirements?	240-56062752 Clause 3.6 & 3.7, SANS 1029	
Is each transformer kVA and voltage rating offered, designed, manufactured and type tested in accordance with the Eskom and applicable SANS requirements? Or Is each transformer kVA and voltage rating offered, compliant for the submitted; transformer designs, technical schedules, testing reports formats and testing schedule proposals? Notes: 1) The supply of individual mini sub rated items will only be allowed once all applicable tests are completed and compliant. 2) All tests performed as part of contract award will be for the cost of the supplier and require to be witnessed by suitable Eskom technical representatives. 3) In-house testing will only be considered if proof can be submitted and shown during documentation and factory evaluations that the test laboratory is compliant and calibrated for the tests to be performed, and were or will be witnessed by a suitable Eskom technical representative.	240-56062752 Clause 1, Clause 3.1.2.2, Clause 3.6 & Clause 3.7	
Are the rated lightning impulse peak with-stand levels for all MV equipment in accordance with the Eskom requirements?	240-56062752 Clause 3.1.2.1	
Are the drawings for the mini subs LV panels submitted compliant for the LV earth and neutral bar arrangements required?	240-56062752 Clause 3.1.2.5 fig 1 and fig 2	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 13 of 32

Type A Mini Sub technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is the rated normal current of the LV busbars submitted and compliant?	240-56062752 Clause 3.1.2.6 table 2	
Is the LV gland plate arrangement with outgoing feeder cable gland plates provided?	240-56062752 Clause 3.1.2.7	
Are drawings for all mini sub auxiliary equipment submitted, including the OEM equipment descriptions?	240-56062752 Clause 3.1.2.8	
Is the top oil temperature gauge design, make and test reports proofing the gauge functionality submitted, and compliant to Eskom requirements?	240-56062752 Clause 3.2.1.2 c)	
Are the make, type and type test reports in accordance with SANS 60947-2 and the standard rating for the main LV circuit breakers submitted?	240-56062752 Clause 3.2.1.2 d)	
Are drawings for all mini sub auxiliary equipment submitted, including the OEM equipment descriptions?	240-56062752 Clause 3.1.2.8	
Are all wiring and ferruling in accordance with D-DT-0868?	240-56062752 Clause 3.1.2.8 e)	
Are all auxiliary wiring diagrams in accordance with D-DT-0868 submitted?	240-56062752 Clause 3.4.2.1	
Is the technical specification for the surge arresters submitted and compliant to Eskom requirements?	240-56062752 Clause 3.1.2.4.3	
Is a drawing that shows MCCB mounting plate details provided?	240-56062752 Clause 3.4.4	
Are the total cost calculations for each transformer size submitted in accordance with the Eskom requirements? See transformer losses and capitalisation.	240-56062752 Clause 3.5	
Are drawings of all labels submitted?	240-56062752 Clause 3.8.2.2	
Does the mini sub make provision for the support (clamping) of two incoming cables in the MV compartment? (a drawing to be submitted)	240-56062752 Clause 3.2.2.1b.	
Any one "NO" on the above scores the supplier will be disqualified. The mini sub should fully comply with Eskom specifications where applicable to obtain a YES on the mini sub assembly and construction.		

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 14 of 32

3.4.2 Technical evaluation criteria Type A Mini Subs – Level 2 score

Type A Mini Subs technical evaluation for the documentation exercise			
Level 2 scoring/rating - (only submission that passes Level 1 gatekeepers)			
Routine testing and type testing Weight: 5			
Criteria	Clause	Weight	Score
Were type tests performed in the last 10 years?	240-56062752 Clause 3.6.1	2	
Generic routine test certificate & reports submitted and compliant?	240-91422345 Clause 3.6.1 h	2	
Factory routine tests failure rate. (Number of mini subs tested and failed per annum/number of mini subs tested per annum) Figures must be auditable for the last 2 years. Suppliers with greater than 5% failure rates will be excluded.	Ratio	1	
<ul style="list-style-type: none"> For Type testing performed within the last 10 Years supplier gets 100% and loses 20 % for each additional year (for the respective question above). For the routine test certificate or report supplier gets 100 % if all requirements as per SANS included, and loses 20% for each missing requirement. Factory routine tests failure rate. (Number of mini subs tested and failed per annum/number of mini subs tested per annum), figures must be auditable for the last 2 years. Suppliers with greater than 5% failure rates will be required to proof action plans to address routine failures. 		Total	/5
Technical schedules Weight: 2			
Criteria	Clause	Weight	Score
Correctness of completion of technical schedules (i.e. no "TBA", "Comply", "Noted", "supplied later", "Noted" acceptable only when Eskom informs)	Technical schedules A & B	1	
No technical deviations submitted	Technical schedules A & B	1	
NB: The technical schedules B are provided on the Annexures of the mini sub specifications. <ul style="list-style-type: none"> Negative marking is done and a penalty of 2 % is applicable for each incorrect completion deviation. Negative marking is done and a penalty of 3 % is applicable for each deviation from meeting Eskom specification and deviations. 		Total	/2
Drawings Weight: 6.5			
Criteria	Clause	Weight	Score
Drawing number shown on drawing.		0.5	
Revision number shown on drawing.		0.5	
Dimensions shown on drawing.		0.5	
Detailed description provided in "Title".		0.5	
Drawing checked, approved & date shown on drawings.		0.5	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 15 of 32

Complete legend.		0.5	
Marking of wiring shown on drawing.		0.5	
Drawing for rating plate with all necessary information.		0.5	
Complete labelling of general assembly diagram.		0.5	
Does drawing of rating plate state: "MANUFACTURED TO ESKOM SPECIFICATION 240-56062752"?	240-56062752 Clause 3.8.1.1	1.0	
Does drawing of rating plate state the winding material for both MV and LV of the transformer?	Technical schedule A requirement	0.5	
Treatment and Full First Aid Instructions submitted?	240-56062752 Clause 3.8.1.2 a)	0.5	
Negative marking will be applied, and supplier loses the applicable weighting per deviation.		Total	6.5
Additional documents for other components of the mini sub Weight: 6.5			
Criteria	Clause	Weight	Score
Surge arrester (e.g specification, drawing)	240-56062752 Clause 3.1.2.4.3	1.5	
HRC fuses (e.g specification, drawing)	240-56062752 Clause 3.1.2.4.4	1	
V.T Test block documents (e.g OEM specification, drawing)	240-56062752 Clause 3.1.2.4.1	1	
C.T Test block documents (e.g OEM specification, drawing)	240-56062752 Clause 3.1.2.4.2	1	
Screen separable connectors (e.g OEM specification, drawing)	240-56062752 Clause 3.7.3	1	
Cable support clamps (e.g OEM specification, drawing)	240-56062752 Clause 3.2.2.1b)	1	
Negative marking is applied, and supplier loses 10% for each deviation from Eskom specification.		Total	/6.5

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 16 of 32

3.5 Technical Evaluation Gate Keepers for all Type B Mini

This section includes the evaluation of all Type B mini subs including: Type B mini subs, Type B high risk mini subs, IRTU fitted Type B mini subs and IRTU fitted Type B high risk mini subs.

3.5.1 Technical Evaluation Criteria applicable to all Type B Mini Sub types: Mandatory Technical Evaluation Requirements

Type B Mini Subs technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is a detailed covering letter containing a list of mini sub items offered submitted? And are all the RMU main component options offered submitted as duplicate mini sub item submissions in the list?		
<p>Is a full list of the manufacturing locations for the offered mini sub type and main components provided for the following:</p> <ol style="list-style-type: none"> 1) The mini substation enclosure manufacturing, 2) The mini substation enclosure painting/ protective coating application, 3) The transformer manufacturing, 4) The bushing manufacturing for the transformer, 5) LV assembly manufacturing, 6) The LV interconnection cable manufacturing, 7) The Type B mini subs RMU manufacturing, 8) The Type B mini subs IRTU and all sub systems manufacturing (if applicable), 9) The Type B mini subs RMU fitted CT's manufacturing, 10) The Type B mini subs RMU fitted bushing manufacturing, 11) The Type B mini subs RMU fitted Vacuum Interrupter manufacturing, 12) LV switchgear manufacturing, 13) The MV interconnection cable manufacturing, 14) The MV cable terminations (SSC's) manufacturing, 15) The Type B mini subs relay manufacturing, and 16) The mini substation final assembly. 		

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 17 of 32

Type B Mini Subs technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
<p>Is a full list, as well as the complete English copies of all transformer designs (including the bushings, core, insulation paper and insulation oil material OEM descriptions), design technical schedules, completed test reports for all transformer individual kVA and voltage ratings offered submitted, and compliant to the Eskom and normative referenced specification requirements?</p> <p>Or</p> <p>Is a full list, as well as the complete English copies of all transformer designs (including the bushings, core, insulation paper and insulation oil material OEM descriptions), design technical schedules, testing reports formats and testing schedule proposals for all transformer individual kVA and voltage ratings offered submitted, and compliant to the Eskom and normative referenced specification requirements?</p> <p>Notes:</p> <ol style="list-style-type: none"> 1) The supply of individual mini sub rated items will only be allowed once all applicable tests are completed and compliant. 2) All tests performed as part of contract award will be for the cost of the supplier and require to be witnessed by suitable Eskom technical representatives. 3) In-house testing will only be considered if proof can be submitted and shown during documentation and factory evaluations that the test laboratory is compliant and calibrated for the tests to be performed, and were or will be witnessed by a suitable Eskom technical representative. 	240-56062752 Clause 1, Clause 3.1.2.2, Clause 3.6 & Clause 3.7	
Is a full list, as well as the complete English copies of all mini sub individual components type test reports (Screened Separable Connectors, MV Cables, LV Cables, Switch disconnectors/ MCCBs, and RMUs) in accordance with the Eskom and normative referenced specification requirements submitted? And is the submission complete for each individual mini sub rating and OEM component offered?	240-56062752 Clause 3.3.1.1 and Clause 3.6 & 3.7	
Are the tests schedule summaries submitted electronically in the provided excel format and in a printed pdf format for each item range offered?	240-56062752 Clause 3.8.2.1	
Is the mini sub manufactured in accordance with SANS 1029 and 240-56062752?	240-56062752 Clause 3.1	
Are the completed individual mini sub items technical schedules B electronically submitted in the provided excel format and in a printed pdf format for each item offered?	240-56062752 Clause 3.8.2.1, & Technical Schedules A and B	
Are completed individual mini sub items technical schedules B signed and printed in hardcopy for each item offered?	Technical Schedules A and B	
Are the completed transformer design technical schedules B electronically submitted in the provided excel format and in a	Technical Schedules A and B	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 18 of 32

Type B Mini Subs technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
printed pdf format for each item offered?		
Are completed transformer design technical schedules B signed and printed in hardcopy for each item offered?	Technical Schedules A and B	
Are the mini substation general assembly drawings submitted?	240-56062752 Clause 3.8.2.2a)	
Are mini substation key dimensions provided on the general assembly drawings submitted?	240-56062752 Clause 3.8.2.2	
Has type testing been performed at an accredited Test facility where applicable?	240-56062752 Clause 3.6.1g) & 3.7	
Is the mini sub and main components type testing requirements met in accordance with the Eskom and SANS requirements?	240-56062752 Clause 3.6 & 3.7, SANS 1029	
Is each transformer kVA and voltage rating offered, designed, manufactured and type tested in accordance with the Eskom and applicable SANS requirements? Or Is each transformer kVA and voltage rating offered, compliant for the submitted; transformer designs, technical schedules, testing reports formats and testing schedule proposals? Notes: 1) The supply of individual mini sub rated items will only be allowed once all applicable tests are completed and compliant. 2) All tests performed as part of contract award will be for the cost of the supplier and require to be witnessed by suitable Eskom technical representatives. 3) In-house testing will only be considered if proof can be submitted and shown during documentation and factory evaluations that the test laboratory is compliant and calibrated for the tests to be performed, and were or will be witnessed by a suitable Eskom technical representative.	240-56062752 Clause 1, Clause 3.1.2.2, Clause 3.6 & Clause 3.7	
Are the rated lightning impulse peak with-stand levels for all MV equipment in accordance with the Eskom requirements?	240-56062752 Clause 3.1.2.1	
Are the drawings for the mini subs LV panels submitted compliant for the LV earth and neutral bar arrangements required?	240-56062752 Clause 3.1.2.5 fig 1 and fig 2	
Is the rated normal current of the LV busbars submitted and compliant?	240-56062752 Clause 3.1.2.6 table 2	
Is the LV gland plate arrangement with outgoing feeder cable gland plates provided?	240-56062752 Clause 3.1.2.7	
Is an assembly drawing showing all the auxiliary equipment and layouts submitted?	240-56062752 Clause 3.1.2.8	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 19 of 32

Type B Mini Subs technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is the top oil temperature gauge design, make and test reports proofing the gauge functionality submitted, and compliant to Eskom requirements?	240-56062752 Clause 3.3.1.4	
Are the make, type and type test reports in accordance with SANS 60947-2 and the standard rating for the main LV circuit breakers submitted? Only required for the 1 MVA mini subs.	240-56062752 Clause 3.3.1.5 b) & c)	
Are the make, type and type test reports in accordance with SANS 60947-3 and the standard rating for the main LV switch disconnectors submitted? Only required for the 315 kVA and 500 kVA mini subs.	240-56062752 Clause 3.3.1.5 a) & c)	
Are drawings for all mini sub auxiliary equipment submitted, including the OEM equipment descriptions?	240-56062752 Clause 3.1.2.8	
Are all wiring and ferruling in accordance with D-DT-0868?	240-56062752 Clause 3.1.2.8e)	
Are all auxiliary wiring diagrams in accordance with D-DT-0868 submitted?	240-56062752 Clause 3.4.2.1	
Is the technical specification for the surge arresters submitted and compliant to Eskom requirements?	240-56062752 Clause 3.1.2.4.3	
Is a drawing that shows a provision for a hole for an external antenna provided?	240-56062752 Clause 3.1.2.4.7	
Is a drawing that shows MCCB mounting plate details provided?	240-56062752 Clause 3.4.4	
Are the total cost calculations for each transformer size submitted in accordance with the Eskom requirements? See transformer losses and capitalisation.	240-56062752 Clause 3.5	
Are drawings of all labels submitted?	240-56062752 Clause 3.8.2.2	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 20 of 32

Type B Mini Subs technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
<p>Is a full list, as well as the complete English copies of all mini sub and applicable RMU internal arc type test reports as per the Eskom and normative referenced specification requirements submitted for each mini sub and RMU combination offered?</p> <p>Or</p> <p>Is a full list, as well as the complete English copies of all mini sub and applicable RMU enclosure design combinations, technical schedules, testing report formats and testing schedule proposals for each mini sub and RMU combination offered submitted, and in accordance with the Eskom and normative referenced specification requirements?</p> <p>Notes:</p> <ol style="list-style-type: none"> 1) The supply of individual mini sub rated items will only be allowed once all applicable tests are completed and compliant. 2) All tests performed as part of contract award will be for the cost of the supplier and require to be witnessed by suitable Eskom technical representatives. 	240-56062752 Clause 3.1 and Clause 3.6 & 3.7	
Does the RMU comply with SANS 1874, Eskom specification requirements, and the technical evaluation criteria in clause 3.6 of 240-91422345?	240-56062752 Clause 3.3.1.1 240-91422345 Clause 3.3.1.6	
Are each RMU option fitted in the mini sub enclosure IAC-AB passed Type test Videos submitted?	240-56062752 Clause 3.6 & 3.7,	
Do the submitted drawings show the integral cable test facility which is independent of the cable termination enclosure?	240-56062752 Clause 3.3.1.1 a	
Is the Mini sub offered with Remote tripping, opening, closing and earthing via a hand-held push-button remote control unit?	240-56062752 Clause 3.3.1.1 b	
<p>Are the RMU cable termination enclosures suitable for the termination of 3-core cables of conductor cross-sectional area up to 300 mm²?</p> <p>Or</p> <p>Are the RMU cable termination enclosures suitable for the termination of three 1-core cables of conductor cross-sectional area up to 300 mm²?</p>	240-56062752 Clause 3.3.1.1 c	
Is the submitted cable termination enclosure and clamp arrangement suitable for the required range of cables to be terminated?	240-56062752 Clause 3.3.1.1 c)vi	
Does the submitted voltage detection system (VDS) meet the requirements of SANS 61243-5?	240-56062752 Clause 3.3.1.1 d	
Is the relay offered and related documentation submitted in accordance with the Eskom specification?	240-56062752 Clause 3.3.1.1 e	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 21 of 32

Type B Mini Subs technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is the MV interconnection cable to be used in accordance with SANS 1029?	240-56062752 Clause 3.3.1.2 a	
Are the screened separable connectors to be used in accordance with SANS 1332 and D-DT-8017?	240-56062752 Clause 3.3.1.2 b	
Where applicable for IRTU fitted Mini sub RMUs only. Will the mini-sub be supplied and fitted with an integrated remote terminal unit (IRTU) for remote monitoring and control of the Mini sub RMU in accordance with the SANS 1874, the applicable Eskom specification requirements, and the technical evaluation criteria in clause 3.6 and clause 3.7 of 240-91422345??	240-56062752 Clause 3.3.1.6	
<p>Any one "NO" on the above scores the supplier will be disqualified.</p> <p>The Type testing should fully comply with the requirements of SANS 1029, SANS 780 and SANS 1874 in order to obtain YES under testing requirements.</p> <p>The mini sub should fully comply with Eskom specifications where applicable to obtain a YES on the mini sub assembly and construction.</p>		

3.5.2 Technical evaluation criteria for Type B Mini Subs – Level 2 score

Type B Mini Subs technical evaluation for the documentation exercise			
Level 2 scoring/rating - (only submission that passes Level 1 gatekeepers)			
Routine testing and type testing Weight: 5			
Criteria	Clause	Weight	Score
Were type tests performed in the last 10 years?	240-56062752 Clause 3.6.1	2	
Generic routine test certificate & reports submitted and compliant?	240-56062752 Clause 3.6.1 and clause 3.7	2	
Factory routine tests failure rate. (Number of mini subs tested and failed per annum/number of mini subs tested per annum) Figures must be auditable for the last 2 years. Suppliers with greater than 5% failure rates will be excluded.	Ratio	1	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 22 of 32

<ul style="list-style-type: none"> For Type testing performed within the last 10 Years supplier gets 100% and loses 20 % for each additional year. For the routine test certificate or report supplier gets 100 % if all requirements as per SANS 1029 included and loses 20% for each missing requirement. Factory routine tests failure rate. (Number of mini subs tested and failed per annum/number of mini subs tested per annum). Figures must be auditable for the last 2 years. Suppliers with greater than 5% failure rates will be required to proof action plans to address routine failures. 		Total	/5
Technical schedules Weight: 2 Total			
Criteria	Clause	Weight	Score
Correctness of completion of technical schedules (i.e. no "TBA", "Comply", "Noted", "supplied later", "Noted" acceptable only when Eskom informs)	Technical schedules A & B	1	
No technical deviations submitted.	Technical schedules A & B	1	
NB: The technical schedules B are provided on the Annexures of the Mini sub specifications, plus on separate excel spread sheaths. <ul style="list-style-type: none"> Negative marking is done and a penalty of 2 % is applicable for each incorrect completion deviation. Negative marking is done and a penalty of 3 % is applicable for each deviation from meeting Eskom spec and deviations. 		Total	/2

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 23 of 32

Drawings Weight: 6.5			
Criteria	Weight	Score	
Does the gas density monitoring device meet the minimum requirements of 240-56062752 Clause 3.3.1.1f)?	0.5		
Drawing number shown on drawing?	0.5		
Revision number shown on drawing?	0.5		
Dimensions shown on drawing?	0.5		
Detailed description provided in “Title”?	0.5		
Drawing checked, approved & date shown on drawings?	0.5		
Complete legend?	0.5		
Marking of wiring shown on drawing?	0.5		
Drawing for rating plate with all necessary information?	0.5		
Complete labelling of general assembly diagram?	0.5		
Does drawing of rating plate state: “MANUFACTURED TO ESKOM SPECIFICATION 240-56062752”? 240-56062752 Clause 3.8.1.1	0.5		
Does drawing of rating plate state the winding material for both MV and LV of the transformer?	0.5		
Treatment and Full First Aid Instructions submitted? 240-56062752 Clause 3.8.1.2	0.5		
Negative marking is applied, and supplier loses the applicable weighting per deviation.	Total	/6.5	
Packaging Weight: 6.5			
Criteria	Clause	Weight	Score
Surge arrester (e.g specification, drawing)	240-56062752 Clause 3.1.2.4.3	1.5	
HRC fuses (e.g specification, drawing)	240-56062752 Clause 3.1.2.4.4	1	
V.T Test block documents (e.g OEM specification, drawing)	240-56062752 Clause 3.1.2.4.1	1	
C.T Test block documents (e.g OEM specification, drawing)	240-56062752 Clause 3.1.2.4.2	1	
Screen separable connectors (e.g OEM specification, drawing)	240-56062752 Clause 3.1.1.1	1	
Cable support clamps (e.g OEM specification, drawing)	240-56062752 Clause 3.2.2.1b)	1	
Negative marking is applied, and supplier loses 10% for each deviation from Eskom specification.		Total	/6.5

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 24 of 32

3.6 Technical Evaluation Gate Keepers for RMU (Type B mini subs only)
3.6.1 Technical Evaluation Criteria for RMU: Mandatory Technical Evaluation Requirements

RMU technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is a full list as well as complete English copies of all RMU type test reports as per the Eskom and normative referenced specification requirements submitted for each OEM RMU type offered? In addition is a full list as well as complete English type test certificates as per the specification requirements submitted if available?	240-56062752 Clause 3.3.1.1 & SANS 1874	
Are the RMU tests schedule summaries submitted electronically in the provided excel format and in a printed pdf format for each item offered?	240-56062752 Clause 3.8.2.1	
Is the RMU manufactured in accordance with SANS 1874 and 240-56062752?	240-56062752 Clause 3.3.1.1	
Are the completed RMU technical schedules B electronically submitted in the provided excel format and in a printed pdf format for each item offered?	Technical Schedules A and B	
Are completed RMU technical schedules B signed and printed in hardcopy for each item offered?	Technical Schedules A and B	
Has proof of the tests laboratory's accreditation by an accreditation body that is a full ILAC member been submitted.	SANS 1874	
Is the RMU components type testing requirements met in accordance with the Eskom and SANS requirements?	240-56062752 Clause 3.6 & 3.7, SANS 1874	
Are the individual OEM RMU IAC-A IEC 62271-200 passed Type test Videos submitted, where applicable for the IEC 62271-202 figure A.4 and figure A.5?	240-56062752 Clause 3.6 & 3.7,	
Is a copy of the RMU factory routine test certificate submitted?	SANS 1874 Clause 5.3	
Is the summary of the RMU drawings and part number schedules submitted and complete in format submitted by Eskom?	240-56062752 Clause 3.8.2.1	
Is the RMU Outline/GA drawings submitted?	SANS 1874 Clause 8.2 (b)	
Are the detailed bills of materials (BOM) for each RMU item offered submitted?	SANS 1874 Clause 8.2.(b).(21)	
Are the operating procedure drawings submitted?	240-56062752 Clause 3.8.1.3 e)	
Are the full technical manuals for the RMU submitted? (Including installation, operating and maintenance manuals)	SANS 1874 Clause 8.3	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 25 of 32

RMU technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is the technical manual for the earth fault indicator offered submitted?	240-56062752 Clause 3.4.2.2 d)	
Are full technical manuals and type description for the circuit breaker protection relay submitted where applicable?	240-56062752 Clause 3.3.1.1 e)	
Where applicable for IRTU fitted Mini sub RMUs only. Will the mini-sub be supplied and fitted with a remote terminal unit (RTU) for remote monitoring and control of the RMU in accordance with the Eskom requirements?	240-56062752 Clause 3.3.1.6	
<p>Any one "NO" on the above scores the supplier will be disqualified.</p> <p>The Type testing should fully comply with the requirements of SANS 1874 in order to obtain YES under testing requirements.</p> <p>The RMU should fully comply with Eskom specifications where applicable to obtain a YES on the RMU assembly and construction.</p>		

3.6.2 Technical evaluation criteria for RMU – Level 2 score

RMU technical evaluation for the documentation exercise		
Level 2 scoring/rating - (only submission that passes Level 1 gatekeepers)		
Routine testing and type testing. Weight: 1		
Criteria	Weight	Score
Were type tests performed in the last 10 years?	0.25	
Generic routine test certificate & reports submitted and compliant?	0.25	
Factory routine tests failure rate. (Number of mini subs tested and failed per annum/number of mini subs tested per annum) Figures must be auditable for the last 2 years. Suppliers with greater than 5% failure rates will be excluded.	0.25	
Are the IAC-AB passed Type test videos compliant with Eskom requirements?	0.25	
<ul style="list-style-type: none"> For Type testing performed within the last 5 Years supplier gets 100% and loses 25 % for each additional year. For the routine test certificate or report supplier gets 100 % if all requirements as per SANS 1874, and loses 25% for each missing requirement. Factory routine tests failure rate. (Number of mini subs tested and failed per annum/number of mini subs tested per annum) Figures must be auditable for the last 2 years. Suppliers with greater than 5% failure rates will be required to proof action plans to address routine failures. 	Total	/1

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 26 of 32

Technical schedules. Weight: 1		
Criteria	Weight	Score
Correctness of completion of technical schedules (i.e. no "TBA", "Comply", "Noted", "supplied later", "Noted" acceptable only when Eskom informs).	0.5	
No technical deviations submitted.	0.5	
NB: The technical schedules B are provided on the Annexures of the Mini sub specifications, plus on separate excel spread sheaths. <ul style="list-style-type: none"> Negative marking is done and a penalty of 2 % is applicable for each incorrect completion deviation. Negative marking is done and a penalty of 3 % is applicable for each deviation from meeting Eskom spec and deviations. 	Total	/1
Drawings. Weight: 7		
Criteria	Weight	Score
Drawing number shown on submitted drawings?	0.25	
Revision number shown on submitted drawings?	0.25	
Detailed description provided in "Title" of submitted drawings?	0.25	
Approved & date of shown on submitted drawings?	0.25	
Complete legend?	0.25	
Position of holding down bolts (Oversized 24 mm) and alignment to the concrete plinth shown on assembly drawing?	0.25	
Position of MV bushings including spacing between bushing centres and between the outer bushing centres and the cable termination enclosure side wall?	0.25	
Outline dimensions for the enclosure and RMU – Height, Width and length of completed assembly.	0.25	
Position and location of cable test facilities?	0.25	
Cable enclosure dimensions?	0.25	
Position of the earth terminals or bars?	0.25	
Position of the live indication system (VDS)?	0.25	
Position of protection relay(s) and current transformers (if applicable); showing the distance from the top of the highest positioned current transformer to the bushing centre line.	1.00	
Position of the earth fault indicator control unit and the remote indicating unit.	0.25	
Removable base sections for cable installation.	0.25	
Positions of cable support clamps and the mounting arrangement showing the distance from bushing centre line to the support clamp and from the base level to the support clamp.	1.00	
Positions of lifting eyes.	0.25	
Position of the documentation pocket.	0.25	
Position of the operating handle storage facility.	0.25	
Position of the rating plate.	0.25	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 27 of 32

Drawings. Weight: 1.5		
Criteria	Weight	Score
Position of all labels and marking.	0.25	
Positions of all signs.	0.25	
Detailed bill of materials (BOM) for each RMU item.	0.25	
Drawing that depicts the mimic indication system.	0.25	
Rating plate drawing indicating the information to be included.	0.25	
IAC requirements venting arrangement.	0.25	
<ul style="list-style-type: none"> Negative marking is applicable, 1 % penalty will be applied for each drawing with a deviation for labelling. Supplier will be penalised in full for not indicating on the drawings the items listed above. 	Total	/1.5
RMU Rating Plate. Weight: 3		
Criteria	Weight	Score
Rated Voltage shown on rating plate.	0.25	
Rated lightning impulse with-stand voltage shown on rating plate.	0.25	
Rated power frequency with-stand voltage shown on rating plate.	0.25	
Rated normal current of busbars shown on rating plate.	0.25	
The manufacturer's name or trade mark shown on rating plate.	0.25	
Manufacturer's type number or type designation.	0.25	
Manufacturer's serial number.	0.25	
The year of manufacture.	0.25	
Total weight of the ring main unit.	0.25	
Testing to specification of the RMU.	0.25	
Standard value of duration of the rated short-time current.	0.5	
Negative marking is applicable, 5 % penalty will be applied for omitting an item on the rating plate.	Total	/3
Switch or circuit breaker rating plate. Weight: 1		
Criteria	Weight	Score
Make or model of equipment.	0.25	
Rated normal current.	0.25	
Rated short-time with-stand current.	0.25	
Rated peak withstand current.	0.25	
Negative marking is applicable, 20 % penalty will be applied for omitting an item on the rating plate.	Total	/1

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 28 of 32

Labels. Weight: 1.5		
Criteria	Weight	Score
Labels indelibly marked.	0.25	
Metallic labels corrosion properties.	0.25	
Compliance of main circuit designation label.	0.25	
Compliance of Auxiliary circuit labels.	0.25	
Compliance of ON, OFF and Earth position labels.	0.25	
Compliance of other Labels to Eskom specification.	0.25	
Negative marking is applicable, 5 % penalty will be applied for each deviation.	Total	/1.5
Wiring. Weight: 2		
Criteria	Weight	Score
Does the Self Powered Protection Relay offered meet Eskom requirements where applicable?	0.25	
Are CT's suitably matched for the Self Powered Protection Relay Ratio, Class?	0.25	
Does the wiring for control plant circuits comply with Eskom spec (wiring of CT, Protection relay and RTU-where applicable)?	0.25	
Terminal blocks compliance to Eskom spec?	0.25	
Are the CT's & Self Powered Relay suitably matched to ensure operation of the Trip Coil circuit.	0.25	
Compliance of labelling- for all Control Plant Components including wire marking to that indicated in the Circuit diagrams	0.25	
Compliance of Circuit wiring diagrams to Eskom requirements, indicating all Control Plant components & circuits. (Protection Relay, CT's, and RTU circuit).	0.5	
Negative marking is applicable, 5 % penalty will be applied for each deviation from Eskom specification	Total	/2
Other components. Weight: 2		
Criteria	Weight	Score
Is the Sealant Strip for Mounting onto concrete plinths details provided (Manufacturer, Material composition and dimensions) in soft copy?	0.5	
Is the instruction manual for EFI submitted in soft copy?	0.5	
Is the instruction manual for Gas pressure indicating device submitted in soft copy?	0.25	
Is the instruction manual for the VDS equipment submitted in soft copy?	0.25	
Is the instruction Manual for the protection relay submitted in soft copy?	0.5	
Negative marking and supplier loses 5 % for each deviation from Eskom specification.	Total	/2

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 29 of 32

3.7 Technical Evaluation Gate Keepers for IRTU (for IRTU fitted Type B mini subs only)
3.7.1 Technical Evaluation Criteria for IRTU: Mandatory Technical Evaluation Requirements

IRTU technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Is a full list as well as complete English copies of IRTU type test reports as per the Eskom and normative referenced specification requirements submitted for each OEM IRTU type offered? In addition is a full list as well as complete English type test certificates as per the specification requirements submitted if available?	240-97690165 Clause 3.5	
Are the IRTU tests schedule summaries submitted electronically in the provided excel format and in a printed pdf format for each item offered?	240-97690165 Clause 3.5	
Is the IRTU manufactured in accordance with 240-97690165 and 240-56062752?	240-97690165 and 240-56062752	
Are the completed IRTU technical schedules B electronically submitted in the provided excel format and in a printed pdf format for each item offered?	Technical Schedules A and B	
Are completed IRTU technical schedules B signed and printed in hardcopy for each item offered?	Technical Schedules A and B	
Is the IRTU components type testing requirements met in accordance with the Eskom and SANS requirements?	240-97690165 Clause 3.5 and SANS 1874	
Is a copy of IRTU factory routine test certificate submitted?	240-97690165 Clause 3.5	
Has the IRTU been type tested for environmental conditions in accordance with SANS (IEC) 61000-4-4:2004?	240-97690165 Clause 3.1.1.2	
Is the IRTU fed from a DC power supply source comprising of a standby battery and battery charger which is provided by the Supplier?	240-97690165 Clause 3.1.2.1	
Is the battery charger able to perform temperature compensation of the batteries, where the output voltage is controlled in relation to the battery temperature to ensure that the batteries are optimally charged?	240-97690165 Clause 3.1.2.3	
Is a 12 VDC output provided to supply Eskom free-issue communications devices?	240-97690165 Clause 3.1.2.6	
Does the battery have capacity to supply the loads (as detailed in 3.1.2.7 of 240-97690165) for 6 hour standby period during loss of the charger AC?	240-97690165 Clause 3.1.2.7	
Do terminal blocks comply with the requirements of 240-70413291: Rev 1?	240-97690165 Clause 3.1.3.4	

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 30 of 32

IRTU technical evaluation criteria for the documentation exercise		
Level 1 Gatekeeper		
TASK / MEASURE		
Criteria	Clause	Acceptance: Yes/ No
Does the communication interface of the IRTU meet the minimum requirements as stated in clause 3.1.4.1 of 240-97690165?	240-97690165 Clause 3.1.4.1	
Is the IRTU provided with two ports: EIA-232 and EIA-485 that support baud rates from 2400 up to 115200 bits per second?	240-97690165 Clause 3.1.4.4	
Is the IRTU equipped with a 100Base-Tx Ethernet port?	240-97690165 Clause 3.1.4.3	
Are all required technical documents submitted?	240-97690165 Clause 3.1.4.4	
Is a mounting space to mount the Eskom free-issue data communications device provided?	240-97690165 Clause 3.1.6.1	
Is a real-time clock available and has the capability of being synchronised by the master station using the DNP3 protocol?	240-97690165 Clause 3.1.7	
If DNP3/IP is supplied: Does the DNP3/ IP comply with the DNP3 Secure Authentication functionality as documented in IEEE1815-2012, Chapter 7 IEEE1815, Chapter 7?	240-97690165 Clause 3.1.8.1 and clause 3.1.8.2	
Is the PC Configuration Software compatible with Microsoft Windows 7 64 bit?	240-97690165 Clause 3.2.1.1	
Does the IRTU store at least 50 real-time clock events in non-volatile memory to allow for post event processing?	240-97690165 Clause 3.2.3.1	
Does the IRTU comply with all of the requirements of Clause 3.3 of 240-97690165?	240-97690165 Clause 3.3	
Is a detailed schematics of the IRTU and associated subsystems submitted?	240-97690165 Clause 3.4.1.3	
Any one "NO" on the above scores the supplier will be disqualified. The Type testing should fully comply with the requirements of 240-97690165 and all other standards as stated in the normative reference of 240-97690165.		

ESKOM COPYRIGHT PROTECTED

**TECHNICAL EVALUATION
CRITERIA FOR MINIATURE SUBSTATIONS**

Revision: 1

Page: 31 of 32

3.7.2 Technical evaluation criteria for IRTU – Level 2 score

IRTU technical evaluation for the documentation exercise		
Level 2 scoring/rating - (only submission that passes Level 1 gatekeepers)		
Routine testing and type testing. Weight: 4		
Criteria	Weight	Score
Generic routine test certificate & reports submitted?	2	
Factory routine tests failure rate. (Number of IRTUs tested and failed per annum/number).	2	
<ul style="list-style-type: none"> For the routine test certificate or report supplier gets 100 % if all requirements as per 240-97690165, and loses 25% for each missing requirement. Factory routine tests failure rate. (Number of IRTU tested and failed per annum/number). 	Total	/4
Technical schedules. Weight: 4		
Criteria	Weight	Score
Correctness of completion of technical schedules (i.e. no "TBA", "Comply", "Noted", "supplied later", "Noted" acceptable only when Eskom informs).	2	
No technical deviations submitted.	2	
NB: The technical schedules B are provided on the Annexures of the Mini sub specifications, plus on separate excel spread sheaths. <ul style="list-style-type: none"> Negative marking is done and a penalty of 2 % is applicable for each incorrect completion deviation. Negative marking is done and a penalty of 3 % is applicable for each deviation from meeting Eskom spec and deviations. 	Total	/4
Technical Documents and Drawings. Weight: 12		
Criteria	Weight	Score
A design drawing to conceal the battery to prevent vandalism and theft to the equipment provided? (240-97690165 Clause 3.1.2.9).	2	
Compliance of the drawing for the DIN rail mounting? (240-97690165 Clause 3.1.6, table 1).	2	
Hardcopy and softcopy manuals covering charger.	2	
Hardcopy and softcopy manuals covering power supplies.	2	
Hardcopy and softcopy manuals covering RTU and its configuration software.	2	
Technical documents of the I/O point DNP3 database assignments.	2	
	Total	/12
Negative marking and supplier loses 5 % for each deviation from Eskom specification.		

3.8 Conclusion

This report is effective to specify the technical evaluation criteria for mini subs to be used in Eskom. The mini subs suppliers are to complete technical schedule B aligned with 240-56062752, and other documents listed in the normative references of the documents above as part of the tender deliverables.

ESKOM COPYRIGHT PROTECTED

4. Revisions

Date	Rev	Compiler	Remarks
March 2016	1	Q. Khumalo & T. Du Plessis	New document.

5. Acknowledgements

Not applicable.