Eskom	Report	Technology

Title: **TECHNICAL EVALUATION CRITERIA FOR FREE STANDING RING MAIN UNITS**

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Compiled by	Functional Responsibility	Authorized by
Barto Olivier	Queeneth Khumalo	Alex Ndlela
Senior Technician– Dx Cape Coastal Cluster SI	Chief Engineer – Dx Enablement HV Plant	Senior Manager – Dx Engineering
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1. Introduction

This document has been developed to set the standard technical evaluation criteria to be used when evaluating the tender submissions for free standing ring main units to be used in Eskom. This includes both the free standing RMUs and free standing RTU fitted RMUs that are rated for use on three-phase cable systems for nominal voltages from 3.3 kV up to and including 33 kV, and are designed for indoor or outdoor operation at a rated frequency of 50 Hz.

Note: 11 kV RMUs will be used for networks with any of the following system voltages: 3.3 kV, and 6.6 kV.

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

2. Supporting clauses

2.1 Scope

The document covers the criteria for the evaluation of free standing ring main units (RMUs) used within Eskom Holdings SOC (Ltd). The document addresses the standard documented technical evaluation criteria to be used when evaluating the tender submissions for the free-standing ring main units in line with the Eskom Holdings SOC (Ltd) requirements and it is applicable to all the technical evaluations for the related tender submissions.

2.1.1 Purpose

The document provides the standard documented technical evaluation criteria to be used when evaluating the tender submissions for the free standing RMUs and free standing RTU fitted RMUs in line with the Eskom Holdings SOC (Ltd) requirements, and it is applicable to all the technical evaluations for the related tender and or pre-qualification submissions

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions.

2.2 Normative/informative references

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

2.2.1 Normative

[1] ISO 9001 Quality Management Systems.

2.2.2 Informative

[2] 240-56030406: Specification for Ring Main units for systems with nominal Voltages from 3.3 kV to 33 kV.

[3] 240-97690165: Tele-control requirements for ring main units.

[4] SANS 62271- 202, High voltage switchgear and control gear part 202: high voltage / low voltage prefabricated substation.

[5] SANS 62271- 200, High voltage switchgear and control gear part 200 AC metal enclosed: ac metal enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV.

[6] SANS 1874, Switchgear - Metal-enclosed ring main units for rated AC voltages above 1 kV and up to and including 36 kV.

[7] D-DT 8060: RMU, 11kV and 22kV, indoor and outdoor stand alone.

[8] D-DT 8061: RMU 11 and 22kV OD and ID RTU.

2.3 Definitions

2.3.1 General

The definitions in this document and 240- 56030406 shall apply.

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.
Ring main unit (RMU):	A medium voltage metal-enclosed switchgear assembly that comprises a combination of switch dis-connectors, switch-fuse combinations or circuit-breaker functions. These functions incorporate integral cable earthing switches and have facilities for cable testing.

2.3.2 Disclosure classification

Confidential: the classification given to information that may be used by malicious/opposing/hostile elements to harm the objectives and functions of Eskom Holdings Limited**.**

2.4 Abbreviations

The abbreviations in this document and 240- 56030406 shall apply.

Abbreviation	Description
IAC	Internal Arc Classification
RTU	Remote Terminal Unit
MV	Medium Voltage
RMU	Ring Main Unit

2.5 Roles and responsibilities

All Eskom employees and/or appointed bodies involved in the procurement of free standing RMUs and free standing RTU fitted RMUs shall ensure that the product 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 must be conversant with the requirements of this standard, and shall comply with the requirements. 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 free standing RMUs and free standing RTU fitted RMUs acceptance shall be based on fully compliant documentation submissions, the compliant factory acceptance tests of the free standing RMUs and free standing RTU fitted RMUs, proving manufacturing capability and capacity during factory evaluations, and the sample compliance to Eskom requirements. Any non-disqualifying deviations shall be corrected as part of possible contract award or pre-qualification listing.

2.7 Related/supporting documents

Technical Schedules A & B (Excel files to be send with the rest of the documents during the enquiry).

3. Requirements

This document contains the technical evaluation criteria for factory-assembled free standing RMUs and free standing RTU fitted RMUs that are rated for use on three-phase cable systems for nominal voltages from 3.3 kV up to and including 33 kV, and are designed for freestanding indoor or outdoor operation at a rated frequency of 50 Hz.

The three phases of the technical evaluation criteria are specific to free standing RMUs and free standing RTU fitted RMUs evaluated. The evaluation methodology will include three main parts, namely the documentation evaluation, the factory evaluation and sample evaluation.

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 Commercial submission compliance evaluations were concluded. Unless otherwise agreed; only Commercial compliant submissions shall be considered for technical evaluations to conclude the tender process. Any evaluation of non-compliant tenderers to the Commercial requirements will be at the discretion of Eskom. The submitted documents will be evaluated against the evaluation criteria as stated in clause 3.4 to 3.5 of this document.

Failure to achieve the minimum threshold (see table 1) as per Eskom's requirement's will lead to immediate disqualification.

During the documentation evaluation; fully compliant type tested free standing RMUs and free standing RTU fitted RMUs in accordance with SANS 1874, SANS 62271-200, SANS 62271-202, 240-56030406, 240-97690165 and Technical Schedules A & B will be required. Failure to submit and comply with the type test requirements specified in these documents will lead to immediate disqualification.

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: Level 1: gate-keeper, and the level 2: submission requirements. Table 1 below summarises the scoring matrix for both the free standing RMUs and free standing RTU fitted RMUs.

For free standing RMU (without RTU): The documentation tender submission must meet the minimum threshold of 80 on level 1 gate-keeper technical evaluation requirements (Clause 3.4.1). Failure to achieve a score of 80 on level 1 gate keeper will result to immediate disqualification. Achievement of the minimum threshold of 80 on level 1 gate-keeper will proceed to the level 2 evaluations.

For RTU fitted free standing RMU: The documentation tender submission must achieve full compliance on Level 1 technical evaluation criteria for RTU as stated in clause 3.5.1. Tenderers will be required to achieve a minimum threshold of 80 on level 2 technical evaluation criteria for RTU as stated in clause 3.5.2 of this document. Failure to achieve full compliance on clause 3.5.1 and achieving a minimum of 80 on level 2 (clause 3.5.2) will lead to immediate disqualification for all RTU fitted RMUs.

Table 1: Scoring weight allocation for free standing RMUs and RTU fittted RMUs

Relevant clauses	Free standing RMU	RTU Fitted RMU
3.4.1 Technical Evaluation Criteria Free Standing RMUs: Mandatory Technical Evaluation Requirements – Level 1	80 (minimum required)	80 (minimum required)
3.4.2 Technical evaluation criteria for RMUs – Level 2 score	20	20
3.5.1 Technical Evaluation Criteria for RTU to be fitted on RMUs: Mandatory Technical Evaluation Requirements – Level 1	0.0 (N/A)	Full compliance
3.5.2 Technical evaluation criteria for RTU – Level 2 score	0.0 (N/A)	80% (Minimum)

3.2 Factory Evaluation

The factory evaluations will only be performed on the submissions that have met all the level 1 technical evaluation gate-keeper requirements as stated in this document. Eskom Commercial shall make the arrangements for factory visits and ensure the technical representatives are invited in time.

At the factory, the Eskom evaluating representative(s) will conduct the evaluation through the use of checklists. The checklists will be used to verify factory capability and manufacturing method compliance to the type tested free standing RMUs and free standing RTU fitted RMUs offered.

The factory evaluation will consist of the following:

- RMU OEM assembly manufacturing plant evaluation. This will include; metal work, labelling, wiring, painting, etc,
- RMU main components manufacturing evaluation (i.e busbar, switch dis-connectors, circuit breaker, gas or air insulated compartments, SF6 filling if applicable, etc), and
- The South African Factory/ Site where the final assembling of the free standing RMUs and free standing RTU fitted RMUs will be performed. All local and overseas manufacturers and manufacturing locations to be evaluated as part of the factory evaluations shall be stated in the tender submission. Where various options for more cost effective local manufacturing are proposed, these shall be indicated as such to ensure all manufacturing locations where applicable are evaluated before possible contract negotiations.

The following areas shall be assessed during the manufacturing evaluation:

a) Machinery capability.

b) Production process and critical check points.

c) The product and manufacturing setup design process and design capability (I.e. related development testing, software simulations, R&D, etc.).

d) Welding.

e) SF6 filling and testing.

f) Vacuum interrupter manufacturing.

g) Circuit breaker assembly.

h) Switch dis-connector assembly.

i) Busbar assembly.

j) Painting process.

k) IED fitment and testing (where applicable).

l) RTU and all sub systems manufacturing, fitment and testing (where applicable).

m) Battery management system, fitment and testing.

n) VDS fitment and testing.

o) Bushings.

p) CTs fitment and testing.

q) VT fitment and testing.

r) Material handling and storage.

s) Packaging of materials.

t) Testing facilities including certification and calibration of testing equipment.

u) Routine testing procedures.

v) The manufacturing plant setup.

One of the following conditions will have to be met for the overseas factory evaluation i.e condition for factories to which Eskom has previously performed factory evaluations within the last ten years, or condition for factories to which Eskom has never performed factory evaluations or factory evaluations were performed more than ten years ago.

3.2.1 Condition where Eskom has previously performed factory evaluations within the last ten (10) years:

Overseas factory evaluations will not be performed if an open tender evaluation was performed on the product or products offered within the last ten (10) years. If a published report was compiled and is available for the previously completed factory evaluations, then the information available from that report shall be used and there would be no need to re-evaluate the overseas factory as per clause 3.2 of this document.

If however there has been changes either on the design, or manufacturing process or raw material (including change of the location of the manufacturing plant or change of main component suppliers from the previous evaluation) then it might be required to perform the overseas factory evaluation depending on a decision done by the Eskom evaluation team. If the Eskom evaluation team deem it necessary to perform the overseas factory visit, such will be communicated once the desktop evaluation is concluded. Any changes done on the previously evaluated submission (if applicable) must be clearly stated in the submission.

3.2.2 Eskom has previously performed factory evaluations more than ten (10) years ago, or no factory evaluation has been previously performed

Full overseas factory evaluation in accordance with clause 3.2 above shall be performed for these kinds of submissions.

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 factory sample evaluation shall be performed at the respective supplier's final assembly of the free standing RMUs and free standing RTU fitted RMUs facilities in RSA.

The following areas shall be assessed during the assembly manufacturing evaluation with the use of specific inspection check sheets:

a) Sample(s) evaluation of the final assembled outdoor and indoor free standing RMUs and free standing RTU fitted RMUs units. An exact replica of each type offered shall be required for the evaluation per supplier (I.e. 1X outdoor free standing RMU, 1X outdoor free standing RTU fitted RMU, 1X indoor free standing RMU and 1X indoor free standing RTU fitted RMU).

b) DNP3 Protocol Verification tests.

c) Routine test certificate checks.

d) Technical schedule compliance.

e) Drawing compliance.

f) Specification compliance.

g) Protection functionality.

h) RTU functionality.

At the end of this exercise, the Eskom evaluating representative(s) list all the deviations, if any. The representative conducts a formal discussion of the deviations in line with Eskom's requirements. If major discrepancies are identified the supplier will be disqualified. For minor discrepancies, the Tenderer and their OEM are given opportunity to decide whether they agree or disagree to meet Eskom requirements upon contract award.

The action plans for resolving the discrepancies will be agreed between Eskom representative(s) and the supplier. At the end, the Eskom, Tenderer/Vendor and OEM representatives sign the evaluation document which continues to be used for concluding the Technical Evaluation report. Where the Tenderer and OEM agreed to meet Eskom requirements, all of these form part of the contract and verification afterwards.

Note: The total cost for the preparation of the sample, performing all required routine tests, performing all required sample tests (if applicable), performing protection functionality tests, performing RTU functionality test, and ensuring full compliance to Eskom's requirements shall be for the tenderer.

3.4 Technical Evaluation Gate Keepers for RMUs

3.4.1 Technical Evaluation Criteria for Free Standing RMUs: Mandatory Technical Evaluation Requirements

This evaluation section will cover free standing RMUs for all application i.e: Indoor or outdoor application, inland or coastal application, single core cable entry or three core cable entries.

	Level 1 Gatekeeper: RMU technical evaluation criteria		
Item number	**Criteria**	**Clause**	**Score**
1.	Is a detailed covering letter containing a list of items offered submitted?	Buyer's guides & Technical schedules	4
2.	Is a full list of the manufacturing locations for the offered and applicable type tested RMU types and main components provided for the following:		
	2.1 The RMU OEM manufacturing i.e: • Assembly, (1 point) • Welding, (1 point) • SF6/gas filling, (1 point) • IEC routine testing, (1 point)		4
	2.2 The RMU OEM component manufacturing i.e: • Circuit breaker, (1 point) • Switch dis-connector, (1 point) • Bus bars, (1 point) • Fused switch dis-connectors, (1 point) • VDS, (1 point) • Wiring/ cables. (1 point)		6

	Level 1 Gatekeeper: RMU technical evaluation criteria		
Item number	**Criteria**	**Clause**	**Score**
	2.3 The SPR or IED manufacturing, • Hardware, software, detailed (0.4 point) • HMI Interface, (0.2 point) • Settings via HMI-, (0.1 point) • Protection Functions, (1.0point) • SER – 5* Time & Date Stamped records (0.1 point) • Proof that self powered protection system capable of operating up to short circuit breaking current of MV circuit breaker (0.2).	Section 3 of 240-64685228	2
	2.4 The CT and VT manufacturing:	Section 3 of 240-64685228	2

	Level 1 Gatekeeper: RMU technical evaluation criteria		
Item number	**Criteria**	**Clause**	**Score**
	2.4.1 CT Manufacturing • Type of CT, (0.1) • Class, (0.1point) • Accuracy, (0.1 point) • Ratios, (0.1 point) • Rated short time withstand current, (0.1 point) • Position of CT relative to the breaker, (0.2 point) • Terminal markings, (0.1 point) • Type test report, (0.2 point) 2.4.2 The VT manufacturing • Type of VT, (0.1 point) • Ratio, (0.1 point) • Class, (0.1 point) • Burden, (0.1 point) • Voltage Factor, (0.2 point) • Position of VT relative to the Busbar (0.2 point) Type Test Reports (0.2)		
	2.5 The RMU enclosure manufacturing for outdoor applications.		2
	2.6 The RMU chimney, top vent and/or base frame for indoor applications.		2
	2.7 The RMU outdoor enclosure painting/ protective coating application.		2
3.	Is a full list of all type test reports submitted? Type test reports to be written in English,	240-56030406, SANS 1874, IEC/SANS 62271- 200	2

	Level 1 Gatekeeper: RMU technical evaluation criteria		
Item number	**Criteria**	**Clause**	**Score**
4.	Are complete English copies of all type test reports as per all the Eskom and normative referenced specification requirements submitted for the RMUs offered?	240-56030406, SANS 1874, IEC/SANS 62271- 200	2
5.	For free standing RMUs. Is a full list, as well as the complete English copies of all applicable type tests required for all RMU combinations offered, submitted and compliant in accordance with the Eskom specification 240-56030406 and the normative referenced standard / specification requirements of SANS 1874 and SANS 62271-200? **Note:** All applicable type test reports in accordance with SANS/IEC 62271-200.	240-56030406 Clause 3.22	15
6.	Internal arc classification type test reports required for RMUs intended for outdoor application or indoor application. **Note:** Two evaluation scoring sheets will be performed to separate the scoring for RMUs intended for indoor application and the RMUs intended for outdoor application.		
	6.1 For outdoor free standing RMUs. Is a full list, as well as the complete English copies of all applicable type tests in accordance with the Eskom specification 240-56030406 required IAC-AB for all RMU and outdoor RMU enclosure combinations offered, submitted and compliant in accordance with the Eskom specification 240-56030406 and the normative referenced standard of SANS 1874 and SANS 62271-202? **Note:** IAC – AB type test report for both the switching compartment and the cable compartment. Or	240-56030406 Clause 3.22	16 Or
	6.2 For indoor free standing RMUs. Is a full list, as well as the complete English copies of all applicable type tests required for IAC-A for all RMU and chimney, top venting and/or base frame combinations offered, submitted and compliant in accordance with the Eskom specification 240-56030406 and the normative referenced standard / specification requirements of SANS 1874 and SANS 62271-200? **Note:** Ceiling height to be clearly indicated on the type test reports for RMUs intended for indoor application.	240-56030406 Clause 3.22	16

	Level 1 Gatekeeper: RMU technical evaluation criteria		
Item number	**Criteria**	**Clause**	**Score**
7.	Are the tests schedule summaries submitted electronically in the provided excel format?	Technical schedules (Drwg & Type Test schedule)	1
8.	Are the completed technical schedules B electronically submitted in the provided excel format?	Technical schedules A & B	1
9.	Does the completed schedule B meet the Eskom schedule A requirements (i.e. all items with value/ description on schedule A or with accepted deviations)?	Technical schedules A & B	1
10.	Are the free standing RMUs manufactured in accordance with SANS 1874? **Note:** Focus will be paid on the cable test facility.	SANS 1874,	1
11.	Are the indoor free standing RMU IAC-A passed Type test videos submitted and compliant with the Eskom safety requirements?	IEC or SANS 62271- 200, and 240-56030406: clause 3.22d)3)	10
12	Internal arc classification type test videos required to RMUs intended for outdoor application or indoor application. **Note:** Two evaluation scoring sheets will be performed to separate the scoring for RMUs intended for indoor application and the RMUs intended for outdoor application.		
	12.1 Are the outdoor free standing RMU IAC-AB passed type test videos submitted and compliant? **Note:** IAC – AB type test videos for both the switching compartment and the cable compartment. Or	IEC or SANS 62271- 202, and 240-56030406: clause 3.22d)3)	10 Or
	12.2 Are the indoor free standing RMU IAC-A passed type test videos submitted and compliant? **Note:** Simulation of ceiling height to be visible on the IAC – A type test videos for RMUs intended for indoor application.	IEC or SANS 62271- 202, and 240-56030406: clause 3.22d)3)	10
13	Is a copy of the RMU factory routine test certificate submitted?	SANS 1874 clause: 5.3.2 to 5.3.5	1
14	Is the summary of drawings and part number schedules submitted and completed in a format submitted by Eskom?	Technical schedules (Drwg & Type Test schedule)	1
15	Is the RMU outline/general assembly drawings submitted?	240-56030406: clause 3.21b)	1

	Level 1 Gatekeeper: RMU technical evaluation criteria		
Item number	**Criteria**	**Clause**	**Score**
16	Are the detailed bills of materials (BOM) for each RMU item offered submitted?	SANS 1874 clause: 8.2b)21)	1
17	Are the operating procedure drawings submitted?	SANS 1874 clause: 8.3b)	1
18	Is the installation manual/s for the RMU submitted?	SANS 1874 clause: 8.3b)	1
19	Is the maintenance manual/s for the RMU submitted?	SANS 1874 clause: 8.3b)	1
20	Is the technical manual for the earth fault indicator submitted?	SANS 1874 clause: 4.13	1
21	Are full technical manuals for circuit breaker protection relay submitted where applicable?	SANS 1874 clause: 4.6.2	1
22	Has Type testing been performed at an accredited Test facility?	SANS 1874 clause: 5.1.4 & clause 8.2b)21)i)	2
23	Has proof of the tests laboratory's accreditation by an accreditation body that is a full ILAC member as well as proof that the accreditation body is an MRA signatory of ILAC been submitted.	SANS 1874 clause: 5.1.4 & clause 8.2b)21)i)	1
24	Is a detailed technical design document for the remote tripping (hand held push-button remote facility) submitted?	240-56030406 clause 3.4	1
25	Has operational manual for the self-powered relay been submitted?	240-56030406 clause 3.6	1
26	Does the self-powered relay comply with the protection requirements?	61850240-56030406 clause 3.6	1
27	Does the CT comply with the requirements of SANS 61869-2?	SANS 61869-2	1
28	Does the VT comply with the requirements of SANS 61869-3 (where applicable)? **Note:** Full points will be awarded for units that do not require a VT.	SANS 61869-3	1
Total			**100**
Minimum score of **80/100** is required to continue to the next phase of evaluation.			

3.4.2 Technical evaluation criteria for RMUs – Level 2 submission requirements

Level 2 submission requirements: RMUs technical evaluation for the documentation exercise- (only submission that passes Level 1 gatekeepers)			
Criteria	**Clause**	**Weight**	**Score**
Routine testing and type testing		**Weight: 2**	
Generic routine test certificate & reports submitted? (For all routine tests)		1	
Compliance to painted surface testing.		1	
• For each routine test certificate not submitted the supplier is penalised by 0.1 point per missing routine test report. • Compliance to Eskom requirements for the paint test supplier is awarded full points else zero.		**Total**	
Technical schedules		**Weight: 3**	
Correctness of completion of Technical Schedules i.e. no “TBA”, “Comply”, “Noted”, “supplied later” (“Noted” acceptable only when Eskom informs).		1	
Does Technical Schedule B meet Eskom requirements?	Technical schedule A & B	1	
Completed technical deviations (Where applicable).		1	
NB: The Technical Schedules A and B are provided on an excel format. Negative marking is done, the following shall apply: • Negative marking is done and a penalty of 0.2 is applicable for each deviation from meeting Eskom specification and deviations.		**Total**	
Drawings: To have the following information.		**Weight: 6**	
Drawing number.		0.2	
Revision number.		0.2	
Detailed description provided in “Title”.		0.2	
Date of approval of drawing.		0.2	
Complete legend.		0.2	
The position of holding down bolts (Oversized 24 mm) and alignment to the concrete plinth.		0.2	

Position of MV bushings including spacing between bushing centres and between the outer bushing centres and the cable termination enclosure side wall.		0.2	
Outline dimensions for the enclosure and RMU – Height, Width and length of completed assembly.		0.2	
Position and location of cable test facilities.		0.2	
Cable enclosure dimensions.		0.2	
Position of the earth terminals or bars.		0.2	
Position of the live indication system (VDS).		0.2	
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.		0.2	
Position of the earth fault indicator control unit and the remote indicating unit.		0.2	
Removable base sections for cable installation.		0.2	
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.		0.2	
Positions of lifting eyes.		0.2	
Position of the documentation pocket.		0.2	
Position of the operating handle storage facility.		0.2	
Position of the rating plate.		0.2	
Position of all labels and marking.		0.2	
Positions of all signs.		0.2	
IAC requirements venting arrangement.		0.2	

In the case of outdoor ring main units, the plinth outline superimposed on to the top view of the ring main unit assembly to confirm that the position of the cable support clamps complement the MV cable entry of the concrete plinth.		0.2	
In the case of indoor ring main units, details of the minimum key room dimensions (i.e. ceiling height, distances to rear and lateral walls, if necessary), and cable trench requirements (including recommended positioning of the RMU over the cable trench).		0.4	
Detailed bill of materials (BOM) for each RMU item submitted and compliant.		0.4	
Drawing that depicts the mimic indication system.		0.4	
Negative marking will be applied, and supplier loses the applicable weighting per deviation.		**Total**	
RMU Rating plate to show the following		**Weight: 2.6**	
Fixing details.		0.2	
Material for the rating plate.		0.2	
Rated Voltage.		0.2	
Rated lightning impulse withstand voltage.		0.2	
Rated power frequency withstand voltage.		0.2	
Rated normal current of bus-bars.		0.2	
The manufacturer's name or trade mark.		0.2	
Manufacturer's type number or type designation.		0.2	
Manufacturer's serial number.		0.2	
The month and year of manufacture.		0.2	
Total weight of the ring main unit		0.2	
Testing to specification of the RMU.		0.2	
Standard value of duration of the rated short-time current.		0.2	
Negative marking will be applied, and supplier loses the applicable weighting per deviation.		**Total**	

Switch or Circuit breaker rating plate to show the following information:		**Weight: 1**	
Make or model of equipment.		0.2	
Rated normal current.		0.2	
Rated short-time withstand current.		0.2	
Rated peak withstand current.		0.2	
Tested to standard.		0.2	
Negative marking will be applied, and supplier loses the applicable weighting per deviation.		**Total**	
Labels to comply with the following requirements:		**Weight: 1**	
Labels indelibly marked.		0.2	
Metallic labels corrosion properties.		0.2	
Compliance of main circuit designation label.		0.2	
Compliance of Auxiliary circuit labels.		0.2	
Compliance of ON, OFF and Earth position labels.		0.2	
Negative marking will be applied, and supplier loses the applicable weighting per deviation.		**Total**	
Protection		**Weight: 1.4**	
Does the offered Self Powered Protection Relay meet Eskom requirements? (Full marks are awarded for RMUs without circuit breakers)?	240-64685228, Section 3 240-56030406, Section 3.6	0.2	
Are CT's suitably matched for the Self Powered Protection Relay Ratio, Class?	240-56030406, Section 3.6.1.2	0.2	
Does the wiring for control plant circuits comply with Eskom spec (wiring of CT, Protection relay and RTU-where applicable)?	240-64685228, Section 3	0.2	
Do terminal blocks comply with Eskom's specification?	240-64685228, Section 3	0.2	
Is the minimum Load current required to power the Self Powered Relay stated & does satisfy requirements	240-56030406, Section 3.6.1.1.a	0.2	

Compliance of labelling- for all Control Plant Components including wire marking to that indicated in the Circuit diagrams?	240-64685228, Section 3	0.2	
Compliance of Circuit wiring diagrams to Eskom requirements, indicating all Control Plant components & circuits. (Protection Relay, CT's, and RTU circuit).	240-64685228, Section 3 240-56030406	0.2	
Negative marking will be applied, and supplier loses the applicable weighting per deviation.		**Total**	
Other components		**Weight: 3**	
Is the Sealant Strip for Mounting onto concrete plinths details provided? (i.e Manufacturer, Material composition and dimensions)		0.5	
Is the instruction manual for EFI submitted?		0.5	
Is the instruction manual for Gas pressure indicating device submitted?		0.5	
Is the instruction manual for the VDS equipment submitted?		0.5	
Is the instruction Manual for the protection relay submitted?		0.5	
Are Instruction manuals, drawings and type test reports submitted in both hard copy and soft copy? Is the hard copy clearly labelled and correctly filed? Is the soft copy clearly labelled and correctly placed in folders? (Both maintenance and operating manuals)		0.5	
Negative marking will be applied and supplier will lose the applicable weight for each deviation from Eskom specification.		**Total**	
Grand Total		**20**	

3.5 Technical Evaluation Gate Keepers for RTU (RMUs Fitted with RTU)

This evaluation section will cover the RTU to be fitted in RMUs for all applications i.e: Indoor or outdoor application, inland or coastal application, single core cable entry or three core cable entries.

3.5.1 Gatekeeper RTU Criteria

Full compliance to the requirements as stated in the table below will be required for RTUs to be fitted in RMUs. Failure to comply with these requirements will lead to immediate disqualification for all RTU fitted RMUs.

Specification clause Nr 240-97690165	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference
Clause 3.3.1.1	Both unsolicited report-by-exception and polled report-by-exception shall be supported.	Yes	State Compliance		
Clause 3.3.1.2	Mechanisms to resolve network medium contention shall be supported. Details of the channel contention algorithm shall be provided.	Yes	State Compliance & provide evidence		Provide evidence
Clause 3.3.1.3	The RTU slave implementation of DNP3 shall meet the Level 2 DNP 3 implementation as stipulated in IEEE 1815-2012.	Yes	State Compliance		

3.5.2 Technical Evaluation Criteria for RTU to be fitted on RMUs

Table below list the Level 2 gate keeper evaluation for all RTUs to be fitted in RMUs. Tenderers will be required to score a minimum of 80% (i.e 64/80) to proceed to factory and sample evaluation for RTU fitted RMUs.

Note: A Microsoft Excel spreadsheet of the technical schedule A&B shall be supplied with the criteria. Tenderers shall complete the provided Microsoft Excel spreadsheet and submit as part of tender submission. Supporting documents as indicated in Schedule B shall be submitted for evaluation.

TECHNICAL SCHEDULES A&B FOR TELECONTROL REQUIREMENTS FOR RING MAIN UNITS - 240-97690165

Schedule A provides direction. Schedule B provides for the Supplier's statement of compliance - either Fully Comply, Comply with Development, Partially Comply or Do Not Comply.

The Tenderer/Supplier is required to complete Schedule B and the Reference Section as part of the tender submission data package.

Where instructed, the Tenderer shall provide detailed evidence in the Reference Column for each answer providing the exact location of the evidence in the submitted documentation.

The information in the Reference column provided by the Supplier shall contain the file name, section number and page number where the evidence of compliance can be located, failing which the clause will be deemed to be non-compliant.

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.1.1	**Environmental Conditions**					
3.1.1.1	Class C or sheltered locations of the IRTU shall be applied in accordance with IEC870-2-2:1996	No	State Compliance & provide evidence		provide evidence	1
3.1.1.2	The IRTURMU shall have been type tested in accordance with SANS (IEC) 61000-4-4:2004 Electromagnetic compatibility (EMC), Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test.	No	State Compliance & provide evidence		provide evidence	1
3.1.2	**Power Supply**					
3.1.2.1	The IRTU shall be fed from a DC power supply source comprising of a standby battery and battery charger which is provided by the Supplier.	Yes	State Compliance			1
3.1.2.2	Mechanical switching of the switchgear shall in no way compromise the continuous supply of power feeding the IRTU during normal operating conditions.	Yes	State Compliance			1
3.1.2.3	The battery charger shall be 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.	No	State Compliance & provide evidence		provide evidence	1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.1.2.4	The AC input shall be internally protected against overload and short circuit by a suitably rated AC fuse. Similarly, the DC output shall be internally protected against overload and short circuit from the battery circuit by a suitably rated DC mains circuit breaker.	No	State Compliance & provide evidence		provide evidence	1
3.1.2.5	The battery charger shall be capable of recharging the battery from 0% to 80% of its capacity in a minimum of 15 hours while supplying the IRTU.	Yes	State Compliance			1
3.1.2.6	Provision shall be made for a 12 VDC output to supply Eskom free-issue communications devices.	Yes	State Compliance			1
3.1.2.7	The DC power supply source shall be sufficiently rated to cater for the following items during simultaneous operation:					
3.1.2.7 a	IRTU	Yes	State Compliance			1
3.1.2.7 b	One free-issue communications device that draws 1A continuous and a maximum of 5A short duration with an input voltage range of 10VDC- 16VDC.	Yes	State Compliance			1
3.1.2.7 c	Power operation of RMU switching devices (e.g. mechanism spring-charging motors or independent unlatched power operation of mechanisms – where applicable)	Yes	State Compliance			1
3.1.2.8	The battery shall be capable of supplying the loads as detailed in 3.1.2.7 for a 6 hour standby period during loss of the charger AC supply and shall not be discharged by more than 50% of its rated capacity.	Yes	State Compliance			1
3.1.2.9	An effort shall be made to conceal the battery.	Yes	State Compliance			1
3.1.3	**Wiring and Circuit Terminations**					
3.1.3.1	DC supply to the IRTU shall be supplied through suitably rated MCBs for grading and isolation purposes.	No	State Compliance & provide evidence		provide evidence	1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.1.3.2	The 12 VDC output supply specified in 3.1.2.6 shall be completely pre-wired using PVC-insulated multi-strand 600/1000 V cable, with a cross-sectional area of at least 2.5 mm2 and complies with the requirements of SANS 1507-2.	Yes	State Compliance & provide evidence		provide evidence	1
3.1.3.3	The 12 VDC supply specified in 3.1.2.6 shall be wired through to a spring-loaded insertion terminal blocks.	Yes	State Compliance			1
3.1.3.4	All terminal blocks shall comply with the requirements of 240-70413291: Rev 1, Specification for Electrical Terminal Blocks.	No	State Compliance & provide evidence		provide evidence	1
3.1.3.5	All MCB's shall comply to the requirements of SANS 60947-2:2007, Low-voltage switchgear and control gear – Part 2: Circuit Breakers and IEC 60898:2003, Electrical accessories – Circuit breakers for over-current protection for household and similar installations (Parts 1 and/or 2 as appropriate)	No	State Compliance & provide evidence		provide evidence	1
3.1.3.6	All MCB's shall be wired with the source supply at the top, and the load side at the bottom.	Yes	State Compliance			1
3.1.4	**Communication Interfaces**					
3.1.4.1	The IRTU shall be equipped with the following to facilitate DNP3 data and preferably DNP3/IP communication:					
3.1.4.1 a	A 100Base-Tx Ethernet port.	Yes	State Compliance			1
3.1.4.1 b	Two serial ports that is fully configurable for EIA-232 and EIA-485 with 2kV isolation. This EIA-232 and EIA-485 port shall support fully	Yes	State Compliance			1
3.1.4.2	The IRTU shall be equipped with a fully configurable EIA-232 serial port or a USB to configure the IRTU. The EIA-232 port shall support fully configurable hardware flow control.	Yes	State Compliance			1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.1.4.3	The IRTU shall be equipped with a 100Base-Tx Ethernet port to configure the IRTU.	Yes	State Compliance			1
3.1.4.4	The EIA-232 ports stated in 3.1.4.1 and 3.1.4.2 shall support baud rates from 2400 up to 115200 bits per second.	Yes	State Compliance & provide evidence		Provide evidence	1
3.1.4.5	All communication interfaces shall be easily accessible and sufficient space shall be made available to connect the appropriate interface cable.	Yes	State Compliance			1
3.1.4.6	The EIA-232 interface cable for 3.1.4.1 and 3.1.4.2 and 100Base-Tx Ethernet interface cable shall be provided by the Supplier.	No	State Compliance			1
3.1.4.7	All equipment interfaces shall be accompanied by full documentation	Yes	State Compliance & provide evidence		Provide evidence	1
3.1.5	**External Antenna**					
3.1.5.1	The RMU shall allow for an Eskom free-issue antenna to be mounted external to the RMU or the Mini Sub.	Yes	State Compliance			1
3.1.5.2	Provision for concealed routing of the antenna cable shall be provided.	Yes	State Compliance & provide evidence		Provide evidence	1
3.1.5.3	Entry and exit holes on any metal part of the RMU or Mini Sub for antenna connections shall be bottom-entry only. A 20mm diameter secured knock-outs shall be provided for cable glands.	Yes	State Compliance			1
3.1.6	**Additional Mounting Space**					
3.1.6.1	A DIN rail mounting plate shall be provided by the Supplier, on which to mount the Eskom free-issue data communications device with dimensions as indicated in Table 1 below. Table 1 - Width = 151 mm, Height = 190 mm and Length = 50mm.	Yes	State Compliance			1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.1.6.2	Sufficient space shall be provided to mount the communication device such that the devices status indication lights are at all times clearly visible (after opening the relevant enclosure).	Yes	State Compliance			1
3.1.7	**Real-time Clock**					
3.1.7.1	A real-time clock shall be available and have the capability of being synchronised by the master station using the DNP3 protocol.	Yes	State Compliance			1
3.1.7.2	The real-time clock shall not lose its synchronised time when the IRTU is restarted.	Yes	State Compliance			1
3.1.7.3	The real-time clock shall have a timestamp resolution of 10ms or better.	Yes	State Compliance			1
3.1.7.4	The real-time clock battery shall provide at least 7 days of total standby time.	No	State Compliance & provide evidence		provide evidence	1
3.1.7.5	The battery should not need replacing more often than every 10 years under normal operating conditions.	No	State Compliance & provide evidence		provide evidence	1
3.1.7.6	It is preferable if Simple Network Time Protocol over Ethernet is also available.	No	State Compliance & provide evidence		provide evidence	1
3.1.8	**DNP3 Security**					
3.1.8.1	If DNP3/IP is supplied then the Supplier shall comply with the DNP3 Secure Authentication functionality as documented in [1] IEEE1815-2012, Chapter 7.	No	State Compliance & provide evidence		provide evidence	1
3.1.8.2	If DNP3/IP is supplied and does not support the DNP3 Secure Authentication currently, the Supplier shall ensure that all mandatory requirements as per [1] IEEE1815, Chapter 7 is successfully implemented within the Development Phase of the contract.	No	State Compliance & provide evidence		provide evidence	1
3.1.8.3	If DNP3/IP is supplied Supplier shall specifically indicate what security optional requirements as per [1] IEEE1815 have been implemented contract.	No	State Compliance & provide evidence		provide evidence	1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.2.1	**Software Requirements**					
3.2.1.1	The software shall be compatible with Microsoft Windows 7 64 bit.	Yes	State Compliance			1
3.2.1.2	The software shall provide the facility to save and retrieve configuration files to and from the disk. It is preferred to have the configuration files in a Comma-separated values (CSV) format.	Yes	State Compliance			1
3.2.1.3	All software supplied with the system shall be documented.	No	State Compliance & provide evidence		provide evidence	1
3.2.1.4	A list of minimum computer hardware requirements shall be provided.	No	State Compliance & provide evidence		provide evidence	1
3.2.1.5	The Supplier shall provide release notes of new firmware and only Eskom approved firmware to be installed in the IRTU.	No	State Compliance			1
3.2.1.6	The Tenderer shall supply all terms and conditions related to the distribution of the software in the offer.	No	State Compliance & provide evidence		provide evidence	1
3.2.2	**IRTU Configuration**					
3.2.2.1	Configuration parameters sent to the IRTU shall be stored in non-volatile memory.	Yes	State Compliance			1
3.2.2.2	Configuration parameters sent to the IRTU shall take effect once the new parameters are perceived as being valid.	Yes	State Compliance			1
3.2.3	**Event Logging**					
3.2.3.1	The IRTU shall store at least 50 real-time clock events in non-volatile memory to allow for post event processing.	Yes	State Compliance			1
3.2.3.2	The IRTU shall allow for event data to be downloaded from the IRTU using the PC software configuration tool.	Yes	State Compliance			1
3.3.1	**Level 2 DNP3 Implementation**					

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.3.1.1	Both unsolicited report-by-exception and polled report-by-exception shall be supported.	Yes	State Compliance			1
3.3.1.2	Mechanisms to resolve network medium contention shall be supported. Details of the channel contention algorithm shall be provided.	Yes	State Compliance & provide evidence		provide evidence	1
3.3.1.3	The IRTU slave implementation of DNP3 shall meet the Level 2 DNP 3 implementation as stipulated in IEEE 1815-2012.	Yes	State Compliance			1
3.3.1.4	The Tenderer shall provide all relevant information on their DNP3 implementation, including the DNP3 device profile, clearly defining what objects, function codes and qualifiers contained in the subset are not supported. It shall also be indicated which technical bulletins have been implemented in the device. Any deviations from the subset shall be clearly documented in the proposal.	No	State Compliance & provide evidence		provide evidence	1
3.3.1.5	Event count and event delays for class 1, 2, 3 DNP3 messages shall be configurable per index point.	Yes	State Compliance			1
3.3.1.6	Unsolicited event retry cycles parameters shall be configurable.	Yes	State Compliance			1
3.3.1.7	XML representation of the DNP3 device profile is preferred to be supported and provided by the Tenderer for testing.	Yes	State Compliance & provide evidence		provide evidence	1
3.3.1.8	Proof of independent testing and verification of Level 2 protocol functionality shall be provided with the tender submission furthermore, Level 2 testing from an accredited DNP3 user group test facility shall also be submitted.	Yes	State Compliance & provide evidence		provide evidence	1
3.3.1.9	Proof of support of at least two masters using any combination of serial port and Ethernet port shall be provided.	Yes	State Compliance & provide evidence		provide evidence	1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.3.2	**DNP3 Data Maps (General)**					
3.3.2.1	The DNP3 data maps shall be fully configurable through software	Yes	State Compliance			1
3.3.2.2	The IRTU shall support individual DNP3 class assignment	Yes	State Compliance			1
3.3.2.3	Binary inputs shall be time-stamped with an accuracy of 10ms or better.	Yes	State Compliance			1
3.3.2.4	The IRTU shall provide the ability to invert the status of individual binary input points through the PC configuration software.	Yes	State Compliance			1
3.3.2.5	The IRTU shall support both Direct Operate and Select-Before-Operate DNP3 type controls.	Yes	State Compliance			1
3.3.3	**DNP3 Data Maps (Binary Inputs)**					
3.3.3.1	Status indications shall be provided for all switching devices of the relevant switchgear functional units.	Yes	State Compliance			1
3.3.3.2	Indications provided for the switching devices shall be double bit to indicate switchgear fully opened, switchgear fully closed and switchgear transit states.	Yes	State Compliance			1
3.3.3.3	A single local supervisory isolation switch shall be provided to disable all SCADA controls. An alarm shall be reported to indicate when this switch is in the “Supervisory OFF” position when the controls are isolated.	Yes	State Compliance			1
3.3.3.4	Alarms shall be reported for any abnormality that is associated with the IRTU, i.e. power supplies and battery charger as detailed in Table 2. Details of which shall be supplied by the Tenderer at the tender stage.	Yes	State Compliance			1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.3.3.5	Alarms shall be reported to indicate switchgear unhealthy conditions. These are conditions which could prevent any of the switchgear from operating safely and correctly. The Tenderer shall provide details of these conditions at tender stage.	Yes	State Compliance			1
3.3.3.6	Binary indication inputs that can sense the state of a potential free contact shall be provided as indicated in Table 2. The IRTU should therefore have the ability to sense and report, via the communications protocol, the status of an external third-party device such as an earth fault indicator, temperature monitor, etc. Suppliers shall provide information about these inputs such as the wetting voltage and how that voltage source is derived etc. at tender stage.	Yes	State Compliance & provide evidence		provide evidence	1
3.3.3.7	The charger AC supply fail alarm shall have a delay of 120s before it is reported and a 20s delay before a de-asserted state of AC alarm is reported. This is to avoid chattering alarms when power goes on and off.	Yes	State Compliance			1
3.3.4	**DNP3 Data Maps (Binary Outputs)**					
3.3.4.1	To facilitate network automation, binary outputs that allow for remote control over all components of switchgear shall be made	Yes	State Compliance			1
3.3.5	**DNP3 Data Maps (Analogue Inputs)**					
3.3.5.1	Analogue inputs, from slave DNP3 Level 2 devices, shall be supported by the IRTU via the EIA-232 and EIA-485 communication interfaces of 3.1.4.1.	Yes	State Compliance			1
3.4.1	**Technical Manuals: The following Technical manuals shall be submitted;**					
3.4.1.1	Hardcopy and softcopy manuals covering all components applied in the IRTU, i.e. charger, power supplies, RTU and its configuration software, etc.	No	State Compliance & provide evidence		provide evidence	1

Spec Clause	Description of Clause	Demo in FAT	Schedule A	Schedule B	Reference	Point
3.4.1.2	The I/O point DNP3 database assignments	No	State Compliance & provide evidence		provide evidence	1
3.4.1.3	Detailed schematics of the IRTU and associated subsystems shall be provided	No	State Compliance & provide evidence		provide evidence	1
3.5	**Tests/Sample Evaluation**					
3.5 a	The successful Suppliers will be required to demonstrate the basic operation of the IRTU to Eskom SCADA using the free issued communication equipment before being awarded a contract for supply to Eskom.	Yes	State Compliance			1
3.5 b	All equipment shall undergo thorough functional and performance testing at the contractor's premises by representatives from Eskom after awarding the contract and before delivery of any units to Eskom.	Yes	State Compliance			1
3.5 c	Test equipment to test all functionality as specified shall be made available during testing.	Yes	State Compliance			1
Required minimum to proceed to factory and sample evaluation for RTU fitted RMUs (80%)						**64/80**

3.6 Conclusion

This report is effective to specify the technical evaluation criteria for free standing ring main units to be used in Eskom.

4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Alex Ndlela	Dx Engineering: Senior Manager
Simphiwe Mbonambi	Dx Commercial: Senior Manager
Vusani Phalanndwa	Dx Commercial: Manager

5. Revisions

Date	Rev	Compiler	Remarks
Aug 2021	3	Barto Olivier	Clause 3.2.1 and clause 3.2.2 revised. Revised mandatory criteria to allow a shortened process.
Oct 2018	2	Barto Olivier	Costing matrix of the RTU fitted RMU changed. Added clause 3.2.1 and 3.2.2 for conditions for overseas factory evaluations.
June 2018	1	Barto Olivier	First issue.

6. Development team

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

- Peter Almeida
- Queeneth Khumalo
- George Daniel
- Barto Olivier
- Kenneth Brown
- George Daniel
- Itani Phafula

7. Acknowledgements

Not applicable.