



MWP1054TX Technical Requirements: Phase 6 Shunt Capacitor and Filter Bank Protection Schemes for Transmission Substations

Date: 27 January 2022

- The enquiry is for:
 - **The Development Phase:** The design (functional design, system design and detail design), development, manufacturing, training, testing, delivery, off-loading and erection of a prototype scheme, as well as design base documentation, for Shunt Capacitor and Filter Bank Protection Schemes for Eskom Transmission substations over a period of up to eighteen (18) months.
 - **The Production Phase:** The manufacturing, testing, training, supply, delivery, off-loading and site erection of Shunt Capacitor and Filter Bank Protection Schemes and associated Scheme documentation for use in Eskom Transmission substations, on an “as and when required” basis over a period of four years, with an option to extend for a further four years.
- The only items that will be free-issued to the contractor/supplier during the development and production phases are the Point on Wave (POW) relays.
- **NB:** The scope of this enquiry is for Transmission substations only. Requirements relating specifically to Distribution applications shall not be applicable – details are provided further on in this slide set.

- The technical evaluation will comprise of the following three stages:
 - Stage 1: Mandatory Requirements Evaluation
 - Stage 2: Technical Qualitative Requirements Evaluation
 - Stage 3: Deemed Offer Risk(s) Evaluation
- Tenderer's offers must achieve at least the threshold for each stage in order to qualify for evaluation under a subsequent stage. **Tenderers that do not achieve at least the threshold for a stage will not be evaluated further.**
- Eskom document 240-133674975 'Technical Evaluation Criteria for Phase 6 Shunt Capacitor and Filter Bank Protection Schemes for use in Transmission and Distribution Substations' (Revision 6) explains the technical evaluation methodology in detail.

Stage 1: Mandatory Requirements Evaluation (1)

- The following table lists the criteria and threshold used for the Mandatory Requirements Evaluation stage:

Criteria	Reference*	Comply	Comments
Is a completed "Device Model Information.xls" spreadsheet submitted?	Normative Reference [1]	Yes/No	
Are completed Technical Schedules A&B for Eskom standard [2] 240-150182735, including any deviations, submitted?	Normative Reference [2-AB]	Yes/No	
Are completed Technical Schedules A&B for Eskom standard [3] 240-64685228, including any deviations, submitted?	Normative Reference [3-AB]	Yes/No	
Are the offered products compliant with the requirements stipulated in section 3.6.1.2 of Eskom standard [2] 240-150182735 with respect to the protocols supported for substation automation?	Normative Reference [2-AB]	Yes/No	
Are Deviations to the Referenced Technical Standards submitted with the associated declaration <u>signed</u> by the duly authorised Tenderer's representative?	Annex B	Yes/No	

Stage 1: Mandatory Requirements Evaluation (2)

Criteria	Reference*	Comply	Comments
Are responses to the 'Performance Questions' given in Annex A of Eskom standard [2] 240-150182735 submitted?	Normative Reference [2]	Yes/No	
Are product manuals and/or data sheets for offered protection IEDs and measurement transducers (if applicable) submitted?		Yes/No	
Are CVs for key persons that will be involved during the development phase submitted?		Yes/No	
Is all information supplied in English?		Yes/No	
Threshold: Should the tenderer fail to meet ANY ONE of the above requirements they will be automatically disqualified.			

**References are to Eskom document 240-133674975 (Rev 6)*

- Submissions that receive a “No” for any of these requirements will not be able to proceed to the ‘Technical Qualitative Requirements Evaluation’ stage and therefore will fail the technical evaluation.

- There are **two (2) sheets** to be completed in the Technical Schedules A&B for Eskom standard [3] 240-64685228 – i.e. the sheets named ‘Main IED Req’ and ‘Main IED Type Tests’.
- Protocols required for substation automation – the requirement is that the **offered products (main protection IED and measurement transducers, if applicable) support the IEC61850 Edition 2 standard for GOOSE and MMS** (evidence required by way of supporting documentation).
- Even if there are no deviations to the referenced technical standards listed in Table B.1 of Eskom document 240-133674975, tenderers are to submit a copy of Annex B (Deviations to Referenced Technical Standards) with the **associated declaration signed** by the duly authorised Tenderer’s representative.
- No documents will be accepted after tender closure. Any missing document/information will result in the threshold for this stage not being met and the tender being disqualified from further evaluation.

Stage 2: Technical Qualitative Requirements Evaluation (1)

- This stage shall comprise of scoring in two sub-categories. Each sub-category will be adjudicated a score out of 100%.
 - Sub-category 1: Evaluation of Technical Schedules A&B for Eskom standard [2] 240-150182735
 - Sub-category 2: Evaluation of Technical Schedules A&B for Eskom standard [3] 240-64685228

- The following table lists the criteria and thresholds used for the Technical Qualitative Requirements Evaluation stage:

Criteria	Score %	Threshold	Comments
Sub-category 1: Compliance with Technical Schedules A&B for Eskom standard [2] 240-150182735		80%	
Sub-category 2: Compliance with Technical Schedules A&B for Eskom standard [3] 240-64685228		80%	

- Only submissions that pass the 'Technical Qualitative Requirements Evaluation' scoring threshold of **80%** for each sub-category will proceed to the 'Deemed Offer Risk(s) Evaluation' stage.

Method of Technical Schedule A&B Response

- Tenderers are to submit responses to all A&B schedule items.
- **Schedule A & Evidence Required: Purchaser's specific requirements**
- **Schedule B, Evidence in Tender Returnables & Tenderer's Comments :
Tenderer's guarantees and technical particulars of equipment offered**
 - Responses to A&B schedules shall be based on the requirement of Schedule A.
 - "Comply" shall only be acceptable in response to a Schedule A requirement stating "Comply".
 - Other items requiring a word, sentence or number response shall be responded to with reference to the actual capability of the equipment offered.

Method of Technical Schedule A&B Response

- Tenderers are to indicate ‘Comply’ in Schedule B where they are fully compliant to the requirement(s).
- In cases where a product does not fully comply with a Schedule A requirement, the Tenderer shall respond by indicating either “Partially Comply” or “Do Not Comply”, as applicable, in Schedule B and shall indicate the product’s existing capability and/or reasons for non-compliance/deviations in the “Tenderer’s Comments” column.
- **Note:** Where a Schedule A requirement states ‘Comply’ against the heading of a section from the referenced Eskom standard - this means that compliance is required for all requirements specified under that section heading. In some instances, certain key requirements from or relating to these sections may also be listed separately under the ambit of that heading.

Method of Technical Schedule A&B Response

Supporting Documents for Verification

- Certain responses to A&B schedule items may require verification by Eskom. Tenderers shall provide evidence for this verification by way of supporting documentation. Such items are marked with a 'Yes' in the 'Evidence Required' column in the A&B schedules.
- The Tenderer shall submit a reference, including file name and page number, as well as the file location within the tender pack as to where evidence of the response is to be found.
 - References shall be made to the file name of the electronic copy of the supporting document, and the page number within that file (not necessarily the same as the page numbers printed on each page of the manual).

Evaluation of Technical Schedule A&B Responses

- Tender responses claiming compliance to an item (e.g. 'Comply') but which are found to be partially compliant or non-compliant during verification will be assigned the corresponding score by the Eskom evaluation team.
- Items for which compliance is not claimed (e.g. 'Do Not Comply'), but which are found to be compliant during verification will be scored as 'Non-compliant' or 'Partially compliant', based on the original response.
- Items for which no response is provided shall automatically be scored as 'Non-compliant'.

Scoring of Technical Schedule A&B Responses

- The A&B schedules uses a default weight of 1 for each scored item. Critical items are assigned higher weights which will either be a 2 or 3.
- Each item will be assigned a score by the Eskom evaluation team (using the table below), based upon the tendered response and cross-checked with the supporting documents provided (where applicable). The score for each item will be multiplied by its weight to obtain the total score per item.

Criteria	Score
Fully compliant	3
Partially compliant (minor deviation)	1
Non-compliant (major deviation)	0

- All scores for the Technical Schedules A&B will be tallied and a percentage shall be calculated based on the maximum possible score. This value will be recorded as the “Score %” for the respective sub-category.

Stage 3: Deemed Offer Risk(s) Evaluation

- Eskom's evaluation team shall compile a narrative summarising risks associated with any aspect of the offer:
 - noted during the Technical Qualitative Requirements Evaluation,
 - based on the deviations provided in Table B.1: 'Deviations to Referenced Technical Standards' of Eskom document 240-133674975,
 - based on the response to the technical performance questionnaire (see Annex A of Eskom document 240-150182735), and
 - based on the CVs submitted for the key persons.
- This narrative shall be used to determine and motivate whether the risk is deemed **low / acceptable / high** and will serve as input to the recommendation as to whether the offer should be accepted as shown in the table below:

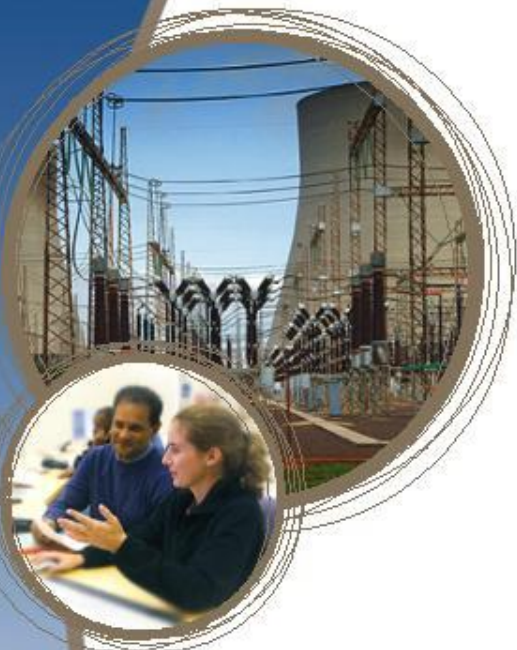
Criteria	Score	Comments
Deemed Offer Risk(s)		
Threshold	Acceptable	

Mandatory/Recommended Conditions of Acceptance of the Tenderer's Offer

- For tenderer's offers that achieve the threshold for all stages of the technical evaluation, but which are found to have deficiencies regarding certain aspects of the offer (e.g. partial-compliances or non-compliances to requirements):
 - that are deemed critical to the offer and/or core functioning of the solution on the Eskom network, and that are deemed to be non-negotiable for contract award,
 - or
 - whose improvement would enhance the offer and/or performance of the solution, but whose resolution is not mandatory for contract award,

Eskom will include 'Mandatory' or 'Recommended' conditions of acceptance, to be negotiated prior to any contract award, in the technical evaluation report.

Distribution Requirements Not Applicable to this Enquiry



Distribution Requirements Not Applicable to this Enquiry (1)

- The scope of this enquiry is for Transmission substations only.
- The tables on the following slides list requirements from Eskom standard 240-150182735 (Rev 2) relating specifically to Distribution applications, which shall not be applicable to this enquiry.
 - **Note:** Only requirements that are crossed-out shall not be applicable to this enquiry. **Any part of a requirement that is not crossed-out shall be applicable.**

Distribution Requirements Not Applicable to this Enquiry (2)

Section Reference from Eskom standard 240-150182735 (Rev 2)	Requirement – crossed-out section shall not be applicable to this enquiry
3.4.5.3 Remote Controls	For Distribution applications in legacy substations, the remote controls shall be implemented using serial DNP3.
3.4.5.4 Remote indications, information and status to be reported	For Distribution applications in legacy substations, the remote indications shall be implemented using DNP3 over serial communication architecture.
3.5.4.1 Measurement - MMXU	The requisite measurement indications shall be reported remotely from the main protection IED to the substation SCADA devices via Ethernet communications using the IEC61850 Edition 2 MMS server protocol (for all Transmission applications and Distribution applications in new substations) or DNP3 slave over serial RS485 communication (for Distribution applications in legacy substations) i.e. avoiding the requirement for measurement transducers wherever possible.

Distribution Requirements Not Applicable to this Enquiry (3)

Section Reference from Eskom standard 240-150182735 (Rev 2)	Requirement – crossed-out section shall not be applicable to this enquiry
3.6.1.1 Communication Ports (Rear Communication Ports (IED))	<ul style="list-style-type: none">• For Distribution applications, the main protection IED shall have a replacement or additional multi-session 100BaseTx copper Ethernet port with RJ45 connector on the rear of the IED for simultaneous substation communication and remote engineering access.• The main protection IED shall also support one serial RS485 port on the rear of the IED for DNP3 communication in legacy Distribution substations.
3.6.1.1 Communication Ports (Measurement Transducers (where applicable))	<ul style="list-style-type: none">• Measurement transducers shall also support one serial RS485 port for DNP3 communication in legacy Distribution substations.

Distribution Requirements Not Applicable to this Enquiry (4)

Section Reference from Eskom standard 240-150182735 (Rev 2)	Requirement – crossed-out section shall not be applicable to this enquiry
3.6.1.2 Communication Protocols (Substation Automation)	The requirement for SCADA communication is that the main protection IEDs and measurement transducers (where applicable) shall concurrently support both the IEC61850 Edition 2 MMS server protocol and DNP3 slave over serial RS485 communication , and this implementation shall be compatible with Eskom's clients within the substation (e.g. gateways, station HMI, data concentrator, etc.).
3.6.1.2 Communication Protocols (Substation Automation)	The IEDs and measurement transducers (where applicable) shall comply with Eskom standard 240-59089329 (DNP3 implementation standard). The supplier shall include in the tender submission, a complete DNP3 Slave Device Profile document as described in the 'DNP3 Subset Definitions', for the products offered. The DNP3 serial slave implementation on the devices offered shall support solicited, report by exceptions. Proof of independent or internal testing and verification of DNP3 serial Level 2 or 3 protocol functionality shall also be provided in the tender submission.

Distribution Requirements Not Applicable to this Enquiry (5)

Section Reference from Eskom standard 240-150182735 (Rev 2)	Requirement – crossed-out section shall not be applicable to this enquiry
3.6.1.2 Communication Protocols (Substation Automation)	During the product development phase, the IEC68150 Edition 2 MMS protocol and DNP3 serial slave protocol implementation on devices offered shall be tested against the existing Transmission and Distribution station gateways to ensure interoperability/compatibility. Any interoperability issues encountered shall be rectified by the supplier during this phase.
3.6.3.1 Ethernet Switch (Distribution Ethernet Switch)	<p>For Distribution applications, the shunt capacitor and filter bank protection scheme shall include a bay Ethernet switch with the following specifications. Alternatively, Eskom shall free-issue an appropriate Ethernet switch.</p> <p>Layer 2 Ethernet Bay Switch – Ruggedcom RSG910G</p> <p>1 X HI (88-300VDC or 85-264VAC) Power Input; DIN and Panel Mounting Kits; 6 x 10/100/1000Tx Fixed Copper Ports via RJ45; 4 x Gigabit SFP Slots</p> <p>Ordering code: 6GK6491-0CB00-3CN0-Z</p> <p><i>(continued on next slide)</i></p>

Distribution Requirements Not Applicable to this Enquiry (6)

Section Reference from Eskom standard 240-150182735 (Rev 2)	Requirement – crossed-out section shall not be applicable to this enquiry
3.6.3.1 Ethernet Switch (Distribution Ethernet Switch)	<i>(continued from previous slide)</i> The base switch shall be populated with 2 x SFP port modules, each with the following details: 1 X 1000Sx Multimode Fibre Port via LC Connector, 850nm, 500m max distance (Ordering code: 6GK6000-8FG51-0AA0) The firmware version for this device shall be RSG910C (ROS v5.4.2). Note: The two 1000BaseSx, LC ports and two 100BaseTx, RJ45 ports on the bay Ethernet switch shall be reserved for connection to the network backbone architecture and scheme front panel engineering ports, respectively.
3.6.3.1 Ethernet Switch (Patch Leads)	For Distribution applications, the supplier shall provide Cat 7e S/FTP Ethernet patch leads for connections between all IEDs in the scheme and the bay Ethernet switch.

Distribution Requirements Not Applicable to this Enquiry (7)

Section Reference from Eskom standard 240-150182735 (Rev 2)	Requirement – crossed-out section shall not be applicable to this enquiry
3.6.3.3 Communications Architecture	For Distribution applications – the bay Ethernet switch shall interface to the substation automation network scheme in a dual star or ring topology. The Eskom Distribution IP addressing philosophy and IED technical names shall be shared with the supplier during development.
4.2.3 Test Template	The test template shall operate and be made available for test equipment hardware and software platforms commonly used within Eskom Transmission and Distribution.

A decorative graphic on the left side of the slide. It consists of two overlapping circles. The top circle contains a photograph of a large industrial facility, likely a power plant, with tall chimneys and complex piping. The bottom circle contains a photograph of two people, a man and a woman, sitting at a table and engaged in a discussion. The background of the slide is white with a blue curved shape on the left side.

Thank you