Eskom	Standard	Technology

Title: **TECHNICAL EVALUATION STANDARD FOR THE STRINGING, EARTHING AND ERECTION AT TRANSMISSION SUBSTATIONS**

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PCM Reference: **Substation Design**

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1. Introduction

This document establishes the technical evaluation strategy for the evaluation of tenders that will be received in response to the request to tender for the work to be done at Transmission Substations. This strategy is a high-level consideration of the key aspects that will give direction to the technical evaluation process. It is in accordance with the Tender Engineering Evaluation Procedure (240-48929482) [1].

This document covers the work required for the stringing, earthing and erection at Transmission Substations within Eskom.

2. Supporting clauses

2.1 Scope

The scope of work for this tender includes the services required for Stringing, earthing and erection at Transmission Substations.

2.1.1 Purpose

The purpose of this document is to standardise the technical strategy and evaluation criteria for application during formal Commercial Enquiry processes for Eskom Transmission substation Stringing, Earthing and Erection services in alignment with Eskom Holdings SOC (Ltd) policies.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions. It is also applicable for all external parties constructing substation infrastructure projects that will be handed over operationally to Eskom.

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] 240-48929482: Tender Engineering Evaluation Procedure

[2] 32-1034: Eskom Procurement and Supply Management Procedure

[3] 240-82736997: Stringing, Cabling, Earthing and Erection Specification for Substations

[4] 0.54/393: Transmission Substation Earthing Standard

[5] TST41-877: Transmission Substation Design Earthing Standard

[6] SANS 1200: Standard Specification for Civil Engineering Construction

[7] OHS Act, 1993: Construction Regulations, 2014

[8] 240-101940513: Substation Earth Electrode Resistance Measurement

[9] TST 41-642**:** Continuity Measurement of Transmission Substation on Earthmat System

2.2.2 Informative

None

2.3 Definitions

2.3.1 Disclosure classification

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

2.4 Abbreviations

Table 1 : List of Abbreviations

Abbreviation	Description
CV	Curriculum Vitae
EDWL	Engineering Design Work Lead
LDE	Lead Discipline Engineer
N/A	Not Applicable
OHSA	Occupational Health and Safety Act
ORHVS	Operating Regulations for High Voltage Systems
SANS	South African National Standards
TET	Technical Evaluation Team
TST	Transmission Standard

2.5 Roles and responsibilities

Engineering Manager: All Engineering Managers throughout Eskom shall ensure that all staff, in their respective areas understand and adhere to this procedure.

Engineering Design Work Lead (EDWL): The EDWL is responsible to manage the execution and adherence to this procedure. Typically, on New Build projects the EDWL role is fulfilled by the Lead Discipline Engineer (LDE) and on existing asset projects the EDWL role is fulfilled by the relevant System Engineer / Plant Engineer.

Technical Evaluation Team (TET) member: The delegated engineers / technical specialists who are responsible to review and evaluate technical aspects of the tender documentation as per the Tender Technical Evaluation Strategy.

2.6 Process for monitoring

N/A

2.7 Related/supporting documents

N/A

3. Tender Technical Evaluation Strategy

3.1 Scope of Work

The scope of work for this tender includes the stringing, earthing and erection at Transmission Substations and will comprise but not be limited to the following activities:

1. Mounting of primary plant equipment on to their respective steelwork structures where applicable.
2. Installing equipment earthing and structure earth tails and ensuring that both the installed equipment earthing, and the structure earth tails are electrically connected to the main earth grid of the substation.
3. Stringing bay equipment and connecting the strung bay to the substation's busbars (and transfer busbars/bypass where applicable).
4. Stringing the substation's lightning earthwire as per the earthwire arrangement drawing.

For a detailed scope see project specific drawings.

3.2 Technical Evaluation Threshold

The scoring for each tender will be done as per the scoring table shown below. This table is as per the requirements of Tender Engineering Evaluation Procedure [1]. The minimum weighted average score required for the tender to be considered technically acceptable is 70%.

Table 2: Evaluation Scoring Table

Score	Percentage	Definition
5	100	**COMPLIANT Meet technical requirement(s) AND; No foreseen technical risk(s) in meeting technical requirements.**
4	80	**COMPLIANT WITH ASSOCIATED QUALIFICATIONS** Meet technical requirement(s) with; Acceptable technical risk(s) AND/OR; Acceptable exceptions AND/OR; Acceptable conditions.
2	40	**NON-COMPLIANT** Does not meet technical requirement(s) AND/OR; Unacceptable technical risk(s) AND/OR; Unacceptable exceptions AND/OR; Unacceptable conditions.
0	0	**TOTALLY DEFICIENT OR NON-RESPONSIVE**
Note 1: The scoring table does not allow for scoring of 1 and 3. **Note 2**: Foreseen acceptable and unacceptable risk(s), exceptions and conditions shall be unambiguously defined in the relevant Tender Technical Evaluation Strategy.		

3.3 TET Members

Table 3: TET Members

TET number	TET Member Name	Designation
TET 1	TBA closer to evaluation	Substation Engineer (Electrical)
TET 2	TBA closer to evaluation	Substation Engineer (Electrical)

3.4 Technical returnables

The following documents shall be submitted when tendering:

a) List of key personnel, their experiences (include CV detailing project-specific work experience for each employee) and academic qualifications. Also include total number of manpower to be dedicated to this project (organogram).

b) List of relevant and comparable projects undertaken. The list shall include project scope, substation name, completion date, project value and client contact person and details. The contractor shall further include any concessions made during each project execution.

c) List of all tools and equipment to be used.

d) Test and measurements methods (procedures) for the various tests and measurements stated in this specification:

- Earth resistance measurements.
- Earth continuity measurements.
- Insulation testing.

e) Erection method statements (including detailed step-by-step procedures) for the following:

- Stringing and termination of conductors.
- Stringing and termination of earth-wire.
- Installation of HV equipment.
- Earthing.
- Brazing of earth connections.
- Crimping.

f) Procedure for compression of clamps.

The following documents shall be submitted **upon** tender award, prior to starting with construction:

a) Proof of training of supervisor as responsible person in accordance with Eskom ORHVS. Copy of ORHVS certificate shall be attached.

b) Proof of qualification of rigger.

c) Proof of qualification of operator of machinery.

d) Calibration certificates of applicable tools and equipment.

e) Test certificates of lifting equipment

3.5 Qualitative Technical evaluation Criteria (A)

Compliant tenders will be evaluated against a set of weighted qualitative evaluation criteria. The evaluation criterion has been broken down into sections and a percentage weighting has been allocated to each section. Percentage weighting summary figures are indicated in Table 4 below. For details of the requirements for criteria scoring, see appendix A. Should a section not be applicable to the scope of a specific project, that section will not be evaluated and that weighting will be redistributed across the remaining sections maintaining the below percentage splits.

Table 4: Stringing, Earthing and Erection Qualitative Technical Evaluation Criteria

	Qualitative Technical Criteria Description		Reference to Technical Specification / Tender Returnable	Criteria Weighting (%)	Criteria Sub Weighting (%)
A1	**Relevant company experience (Projects completed in past 5 years)**		As per 240-82736997, section 3.5, page 17	**40**	-
	1.1	Number of projects	As per 240-82736997, section 3.5, page 17		10
	1.2	Project scope	As per 240-82736997, section 3.5, page 17		10
	1.3	Project value	As per 240-82736997, section 3.5, page 17		10
	1.4	Substation name and completion date	As per 240-82736997, section 3.5, page 17		5
	1.5	Client contact person and details	As per 240-82736997, section 3.5, page 17		5
A2	**Qualifications and experience of key personnel**		As per 240-82736997, section 3.5, page 17	**30**	**-**
	2.1	Academic qualifications	As per 240-82736997, section 3.5, page 17		5

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	2.2	Project-specific work experience	As per 240-82736997, section 3.5, page 17		20
	2.3	Total number of manpower to be dedicated to this project	As per 240-82736997, section 3.5, page 17		5
A3	**Construction/method statements**		As per 240-82736997, section 3.5, page 17	**15**	**-**
	3.1	Relevancy of method statements	As per 240-82736997, section 3.5, page 18		5
	3.2	Adequacy of method statements	As per 240-82736997, section 3.5, page 18		10
A4	**Test Procedures**		As per 240-82736997, section 3.5, page 18	**5**	-
	4.1	Procedures relevant/ comprehensive	As per 240-82736997, section 3.5, page 18		5
A5	**Tools and Equipment**		As per 240-82736997, section 3.5, page 17	**5**	-
	5.1	Adequacy of tools and equipment	As per 240-82736997, section 3.5, page 17		5
A6	**Procedure for compression of clamps**		As per 240-82736997, section 3.5, page 18	**5**	-
	6.1	Procedures relevant/ comprehensive	As per 240-82736997, section 3.5, page 18		5
				TOTAL: 100	

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3.6 TET Member Responsibilities

Table 5: TET Member Responsibilities

Qualitative Criteria Number	TET 1	TET 2
A1	X	X
A2	X	X
A3	X	X
A4	X	X
A5	X	X
A6	X	X

3.7 Foreseen Acceptable / Unacceptable Qualifications

3.7.1 Risks

Table 6: Acceptable technical Risks

Risk	Description
1.	**None.**

Table 7: Unacceptable technical Risks

Risk	Description
1.	**Contractors who do not have the relevant experience.**

3.7.2 Exceptions / Conditions

Table 8: Acceptable Technical Exceptions / Conditions

Risk	Description
1.	**None.**

Table 9: Unacceptable Technical Exceptions / Conditions

Risk	Description
1.	**None.**

4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Derrick Delly	Chief Engineer Substation Engineering
Subhas Maharaj	Senior Manager Substation Engineering

5. Revisions

Date	Rev	Compiler	Remarks
Aug-23	1	Mark Peffer	First Issue

6. Development team

N/A

7. Acknowledgements

N/A

8. APPENDIX A

Item	Description	Section Criteria Weight (%)	Criteria Sub Weighting (%)	Score (0-5)	Sub Weighting (%) = ((Score)/5) X (criteria sub weighting)	Criteria
A1	**Relevant company experience (comparable projects undertaken in past 5 years)**	**40%**	**-**	**-**	**-**	-
1.1	Number of projects		10%			>8 Projects = 5; 3 to 7 projects = 4; 1 to 2 projects = 2; none provided = 0
1.2	Project scope		10%			All three (Stringing, erection, and earthing) provided = 5; One or two out of three provided = 2; None provided = 0
1.3	Project value		10%			> R8m = 5; R2m to R8m = 4; < R2m = 2
1.4	Substation name and completion date		5%			Name and date provided = 5; Only name or date provided = 2; None provided = 0
1.5	References: Client contact person and contact details		5%			Contact name and contact details provided = 5; Only contact name or only contact details provided = 2; None provided = 0
List of relevant and comparable projects undertaken (Maximum points = 25) Total Score						
List of relevant and comparable projects undertaken (Maximum Section weight = 40%) Weighted score = (score) x (40/25)						

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A2	**Qualifications and experience of key personnel**	**30%**	**-**	-	**-**	**-**
2.1	Academic qualifications		5%			Diploma = 5; Certificate/artisan = 4; Grade 12 (National Senior Certificate) and National (vocational) Cert. level 4 = 2; None provided = 0
2.2	Project-specific work experience		20%			>8 Projects = 5; 3 to 8 Projects = 4; <3 Projects = 2; None provided = 0
2.3	Total number of manpower to be dedicated to this project		5%			>20 - 5; 10 to 20 - 4; less than 10 - 2; none provided - 0
List of key personnel (Maximum points = 15) Total Score						
List of key personnel (Maximum Section weight = 30%) Weighted score = (score) x (30/15)						
A3	**Construction/method statements (Stringing, erection and earthing of equipment and steelwork)**	**15%**	**-**	-	**-**	**-**
3.1	Relevancy of method statements		5%			Relevant stringing, erection and earthing method statements provided: All three provided = 5; One or two out of three provided = 2; Irrelevant or none provided = 0
3.2	Adequacy of method statements		10%			Detailed procedures for all activities = 5; Irrelevant or none provided = 0
Construction/method statements (Stringing, erection and earthing of equipment and steelwork (Maximum points = 10) Total Score						
Construction/method statements (Stringing, erection and earthing of equipment and steelwork) (Maximum Section weight = 15%) Weighted score = (score) x (15/10)						

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A4	**Test procedures (earth-mat resistance measurements, Continuity measurements between earthmat and equipment/steelwork)**	**5%**	**-**	-	**-**	**-**
4.1	Procedures relevant/comprehensive		5%			Both test procedures relevant and comprehensive = 5; One out of two test procedures provided = 2; Irrelevant = 0
Test procedures (Maximum points = 5) Total Score						
Test procedures (Maximum Section weight = 5%) Weighted score = (score) x (5/5)						
A5	**Tools and Equipment**	**5%**	**-**	-	**-**	**-**
5.1	Adequacy of tools and equipment		5%			Detailed = 5; Marginal = 4 ; Deficient = 2
Tools and Equipment (Maximum points = 5) Total Score						
Tools and Equipment (Maximum Section weight = 5%) Weighted score = (score) x (5/5)						
A6	**Procedure for compression of clamps**	**5%**				**-**
6.1	Procedures relevant/comprehensive		5%			Relevant and comprehensive = 5 ; Relevant and not comprehensive = 2 ; Irrelevant = 0
Procedure for compression of clamps (Maximum points = 5) Total Score						
Procedure for compression of clamps (Maximum Section weight = 5%) Weighted score = (score) x (5/5)						

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Criteria	Section	Maximum Score	Achieved Score
List of relevant company experience (comparable projects undertaken in past 5 years)	A1	25	
Qualifications and experience of key personnel	A2	15	
Construction/method statements	A3	10	
Test procedures	A4	5	
Tools and Equipment	A5	5	
Procedure for compression of clamps	A6	5	
Total		65	
Percentage obtained = (Achieved Score/65) x 100			

The minimum score required to be considered as a supplier must be 70% or above.