Eskom	Standard	Technology

Title: **TECHNICAL EVALUATION STANDARD FOR SUBSTATION TUBULAR CONDUCTORS**

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PCM Reference: **Substation Design**

SCOT Study Committee Number/Name: **Substation**

Content

1. Introduction

Substation tubular conductors are designed to carry rated normal and fault currents. This standard is intended to ensure that substation tubular conductors supplied to Eskom are properly evaluated to meet the desired performance requirements.

2. Supporting clauses

2.1 Scope

This standard covers the Eskom specific technical evaluation requirements for tubular conductors for use in substations with nominal system voltages up to and including 765kV (Um = 800kV). The substation tubular conductors supplied must comply with the minimum requirements as set out in the relevant Eskom, IEC and European (EN and BS) documents listed.

2.1.1 Purpose

To document, have on record and refer to as required, Eskom's specific technical evaluation requirements for station tubular conductors for use in substations with nominal system voltages up to and including 765kV (Um = 800kV).

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] 32-1034, Eskom Procurement and Supply Management Procedure

[2] 240-48929482, Tender Technical Evaluation Procedure

[3] 240-122922610, Specification for Substation Tubular Conductors.

2.2.2 Informative

None

2.3 Definitions

2.3.1 General

Definition	Description
A_5 elongation test	% permanent elongation for proportional specimens with length equal to 5 times diameter
Accredited testing laboratory/authority	A laboratory which is ISO/IEC 17025 accredited and/or that holds valid certification issued by ILAC (International Laboratory Accreditation Corporation) or one of its members.
Aluminium alloy	Aluminium which contains alloying elements, where aluminium predominates by mass over each of the other elements and where the aluminium content is not greater than 99,00%.

Definition	Description
Certified test report	A certificate of tests performed as specified within the specification, and carried out by an accredited authority or by the manufacturer and witnessed by an accredited authority that has been accredited in accordance with ISO/IEC 17011.
Eskom Assessment Representative(s)	The person(s) appointed by Eskom to perform evaluation of tender submission(s) in line with Eskom requirements.
Extruded tube	Tube brought to final dimensions by extrusion.
Porthole tube/bridge tube	Tube produced by extrusion of a solid billet through a porthole or bridge die.
Quality control plan	A method for documenting the functional elements of quality control that are to be implemented in order to assure that quality standards are met for a particular product or service. The intent of the quality control plan is to formalize and document the system of control that will be utilized.
Quality management system	A collection of business processes focused on consistently meeting customer requirements and enhancing their satisfaction.
Routine test	Tests done to verify the quality and uniformity of the workmanship and materials used in the manufacture of substation tubular conductors.
Seamless tube	Tube which does not contain any line junctures resulting from the method of manufacture.
Tube	Hollow, wrought product with a uniform cross-section, with only one enclosed void and with a uniform wall thickness, supplied in straight lengths. Cross-sections are in the shape of circles and the inner and outer cross-sections are concentric and have the same form and orientation.
Type test	Tests done on the completion of the development of a new design to establish representative performance data. They need to be repeated if the design is changed to modify its performance or there is a change in the manufacturing process.

2.3.2 Disclosure classification

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

2.4 Abbreviations

Abbreviation	Description
°C	degree Celsius
Al	Aluminium
Cr	Chromium
Cu	Copper
Fe	Iron
g	Acceleration due to gravity
kV	kilovolt
m	meter
Mg	Magnesium

Abbreviation	Description
mm	millimetre
Mn	Manganese
MPa	Megapascal
OD	Outside diameter
QCP	Quality control plan
QMS	Quality management system
SANS	South African National Standard
Si	Silicon
Ti	Titanium
Um	Maximum system voltage
WT	Wall thickness
Zn	Zinc

2.5 Roles and responsibilities

Suppliers are responsible for manufacturing, testing and supplying products in accordance with document [3]. All personnel involved within the substation environment shall ensure compliance to these requirements and that tubular conductors are evaluated in accordance with this document.

2.6 Process for monitoring

Suppliers are responsible for manufacturing, testing and supplying products in accordance with document [3]. All personnel involved within the technical evaluation of these products shall ensure compliance to stipulated requirements and that submitted products are evaluated in accordance with this document. The relevant management structures shall ensure compliance.

2.7 Related/supporting documents

This document must be applied together with document 240-122922610.

3. Technical tender evaluation procedure

The technical evaluation procedure is specific to each item tendered for. The technical evaluation for tubular conductors shall consist of two parts which are related, namely the desktop/documentation evaluation and the factory assessment, if deemed necessary.

All supplier submission documentation, reports and certificates shall be in English.

3.1 Desktop / Documentation evaluation

This evaluation exercise is performed by the Eskom evaluating representatives. This part of the evaluation starts when submissions are opened for the first time. It begins with confirmation that all tender technical returnables have been submitted as required. Refer to Annex A for detail.

Successful submissions will then proceed to the qualitative evaluation for a detailed analysis of each submission. Scoring is based on the criteria specified in [2] as reflected in Annex B.

For this the Eskom assessment representatives will go through the details of the returnable submissions that are required and will ensure that all requirements are met.

The score that each tenderer receives will provide a numeric basis for tender comparison. The minimum weighted average score required for the qualitative evaluation for a busbar tubular conductor to be considered shall be 90%.

Outstanding tender technical returnables will result in a score of zero (0) for the applicable section irrespective of the values captured in schedule B.

Short Circuit Withstand ([3] section 3.3.1.3) and Stress-Corrosion Cracking ([3] section 3.3.2.4) tests have been removed as tender submission requirements.

3.2 Factory and product assessment

If deemed necessary this assessment is performed on the basis of assessing the supplier's capability to enter into a contract with Eskom with respect to a specific product or service.

This report and any actions that are listed or recommended as a result of this assessment, is by no means a confirmation or guarantee that any contract will be entered into by Eskom and the supplier or that post contract performance has been achieved.

Any actions undertaken by the supplier as a consequence of this report is for the supplier's account. Any liability for the said actions undertaken by the supplier is not transferrable to Eskom in any way.

The assessment team has no authority or responsibility in the decision taken by Eskom with respect to contracting for a product or service.

Any statements, intentions and/or actions expressed by the assessment team during the assessment and post the assessment has no effect, and does not constitute any liability to Eskom with regards to contract placement or post contract performance guarantees.

3.2.1 Scope

Eskom will do factory assessments to assess the ability and readiness of the supplier for manufacturing and supplying of substation tubular conductors for Eskom in accordance with [3] should the need arise.

Eskom assessment representative(s) will arrange a visit to the factory that has qualified for factory evaluation. At the factory, the Eskom assessment representative(s) will conduct the assessment through the use of checklists. The checklists are used to verify the capability of the factory to supply the required product and compliance to the issued specification and tender submission documents. At the end of this exercise, the Eskom assessment representative(s) will list all the deviations on the evaluation document. The representative will conduct formal discussions of the deviations in line with Eskom's requirements. Herein, the Tenderer and/or their OEM shall indicate whether they agree or disagree to meet Eskom requirements upon contract award. At the end, Eskom, the Tenderer and OEM representatives will sign the assessment 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 are documented for contract award purpose and verification afterwards. This document also details the procedure to be followed when conducting a factory assessment for substation tubular conductors.

3.2.2 Purpose

Assessments are performed as part of the standard practice within Eskom to determine whether a supplier has the capability to manufacture substation tubular conductors, from a business, technical and quality perspective. The assessment also confirms the supplier's compliance to the equipment specification and tender submission documents. This document is intended to formalise the factory assessment procedure followed for substation tubular conductors.

3.2.3 Confidentiality

All information reviewed, observed, recorded during and reported as a result of this assessment will be treated as, and remains highly confidential. The procurement team and the supplier team will be the only parties included in the distribution list.

3.2.4 Assessment Methodology

The assessment will follow a documented product assessment and supplier capability assessment as documented in Annex C and D. These criteria are intended to assess the technical capabilities of the product offered, and the supplier to ensure it meets the tender requirements. During the assessment the following areas shall be evaluated in detail:

- Annex C: In-factory product assessment
  - Evaluation criteria as stipulated in [3]
- Annex D: Factory Assessment
  - Work systems
  - Operation – manufacturing methods
  - Technical infrastructure
  - Design practices and applications
  - Testing facility and practices

The factory will be scored according to the criteria outlined in the table below. The total score is out of 160. The full criterion is listed in Annex D.

5	COMPLIANT Meet technical requirement(s) AND; No foreseen technical risk(s) in meeting technical requirements.
4	COMPLIANT WITH ASSOCIATED QUALIFICATIONS Meet technical requirement(s) with; Acceptable technical risk(s) AND/OR; Acceptable exceptions AND/OR; Acceptable conditions.
2	NON-COMPLIANT Does not meet technical requirement(s) AND/OR; Unacceptable technical risk(s) AND/OR; Unacceptable exceptions AND/OR; Unacceptable conditions.
0	TOTALLY DEFICIENT OR NON-RESPONSIVE

Factory threshold: The minimum score required to be considered technically acceptable, but not guaranteed a contract, must be 90% or greater.

On completion of the product and factory assessments the Factory Product Assessment Evaluation Agreement as given in Annex E will be completed and signed by all parties.

4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Alex Ndlela	Senior Manager, Engineering, Dx
Athelene Gouws	Senior Engineer, Design and Standards Implementation, Gauteng Cluster, Dx
Best Khoza	Engineer, Network Engineering & Design, Cape Coastal Cluster, Dx
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5. Revisions

Date	Rev	Compiler	Remarks
Sept 2021	4	TJ Marais	Section 2.6 updated Threshold requirement updated Section 3.2 updated to indicate “if deemed necessary” Annex A aligned with [3] Annex B: Service conditions removed from evaluation Evaluation criteria aligned with revision 2 of 240-122922610
Nov 2017	3	TJ Marais	Minimum qualifying threshold on pages 6, 7 and 24 corrected to 70%.
June 2017	2	TJ Marais	Document 240-48929482, Tender Technical Evaluation Procedure, added as reference. Table in section 3.2.4 aligned with table 2 in Document 240-48929482. As per the requirements of Eskom document 32-1034 (Eskom Procurement and Supply Management Procedure) all references to mandatory evaluation criteria has been removed and the following sections reworded: 3.1 – Desktop / Documentation evaluation: first paragraph reworded. Annex A: renamed from “Level 1 Mandatory Criteria” to “Tender Technical Returnables”, and the explanation paragraph reworded. Annex B: first paragraph reworded to be aligned with the change in Annex A. Scoring in sections Annex B and D aligned with new guideline in table in section 3.2.4.
March 2017	1	TJ Marais	New document

6. Development team

- Theunus Marais Chief Engineer Substation Engineering

7. Acknowledgements

Kevin Kleinhans, Sphiwe Nkosi and Thinus du Plessis for inputs on the factory evaluation as well as everybody else that contributed through comments on the draft document.

Annex A – Desktop Documentation Evaluation: Tender Technical Returnables

Tender technical returnables are not point scored. These are assessed on a Yes/No basis as to whether or not all required technical documents have been submitted. All submissions must comply with [3], 240-122922610 Specification for Substation Tubular Conductors. The tender technical returnables are:

CRITERIA	CLAUSE in [3]	YES	NO
Is all information supplied in English?	3.1		
Is customer reference list and confirmation of local technical support provided?	3.1.1		
Has completed technical schedule B per product been submitted?	Annex A		
Has the technical deviations sheet per product been submitted and signed?	Annex B		
Have raw material certificates been submitted?	3.2.2/3.2.3		
Have tube dimensional tolerance certificates per product offered been submitted?	3.2.6		
Have electrical resistivity / conductivity test report been submitted?	3.3.1		
Have the following mechanical type test reports been submitted?			
Tensile Strength Test	3.3.2.1		
0.2% Proof Strength Test	3.3.2.2		
Elongation Test	3.3.2.3		

Annex B – Desktop Documentation Evaluation: Qualitative Criteria

After it has been confirmed that all the tender technical returnables have been submitted, the submission will be assessed against the following criteria (shown below with their weightings) with detail as stipulated in [3], 240-122922610 Specification for Substation Tubular Conductors.

Criteria	**Section**	**% weight**	**Weighted Score**
Material properties	B1	30	
Manufacturing method, shape, dimensions and dimensional tolerances	B2	30	
Electrical requirements	B3	20	
Mechanical requirements	B4	20	
Total		**100**	

Threshold: The score that each tenderer receives will provide a numeric basis for tender comparison. The minimum weighted average score required for a busbar tubular conductor to be considered must be above 90%.

ITEM NO	CLAUSE in [3]	DESCRIPTION	UNIT	Criteria	Score
B1	**3.2.2**	**Material properties**			
B1.1	3.2.2	Type of Alloy		6061	5
				Non-compliant	0
B1.2	3.2.2	Designation		AlMg1SiCu	5
				Non-compliant	0
B1.3	3.2.2	Temper		T6	5
				Non-compliant	0
B1.4	3.2.3	Chemical composition		Non-compliant	0 for element
		Silicon (Si)	%	0.40 – 0.80	5
		Iron (Fe)	%	≤ 0.70	5
		Copper (Cu)	%	0.15 – 0.40	5
		Manganese (Mn)	%	≤ 0.15	5
		Magnesium (Mg)	%	0.80 – 1.20	5
		Chromium (Cr)	%	0.04 – 0.35	5
		Zinc (Zn)	%	≤ 0.25	5
		Titanium (Ti)	%	≤ 0.15	5
		Other	%	0.05 – 0.15	5
		Aluminium (Al)	%	95.85 – 98.56	5
Tubular conductor properties (maximum points: 65)				**Score**	
Tubular conductor properties (section weight: 30%)				**Weighted score =** $(\mathbf{Score}) * \left(\frac{\mathbf{30}}{\mathbf{65}}\right)$	

ITEM NO	CLAUSE in [3]	DESCRIPTION	UNIT	Criteria	Score
B2		**Manufacturing method, shape, dimensions and dimensional tolerances**			
B2.1	3.2.4	Manufacturing method		Die/mandrel	5
				Porthole/bridge	5
				Other	0
B2.2		Shape		Round	5
				Non-compliant	0
B2.3	3.2.5	Outer Diameter	mm	As specified	5
				Non-compliant	0
B2.4	3.2.5	Wall thickness	mm	As specified	5
				Non-compliant	0
B2.5	3.2.5	Length	m	As specified	5
				Non-compliant	0
B2.6	3.2.6.1	Tolerance on outer diameter (applicable OD only)	mm	OD 80mm: ±1.1	5
				OD 120mm: ±1.4	5
				OD 200mm: ±2.0	5
				OD 250mm: ±3.0	5
				Non-compliant	0
B2.7	3.2.6.2	Tolerance on wall thickness (dependent on OD and manufacturing method)	%	As specified	5
				Non-compliant	0
B2.8	3.2.6.3	Tolerance on length (dependent on OD and specified length)	mm	As specified	5
				Non-compliant	0
B2.9	3.2.6.4	Tolerance of straightness (applicable OD only)	mm/m	OD 80mm: ±1.5	5
				OD 120mm: ±1.5	5
				OD 200mm: ±2.5	5
				OD 250mm: ±2.5	5
				Non-compliant	0
Manufacturing method, shape dimensions and dimensional tolerances (maximum points: 45)				**Score**	
Manufacturing method, shape dimensions and dimensional tolerances (section weight: 30%)				**Weighted score =** $(\mathbf{Score}) * \left(\frac{\mathbf{30}}{\mathbf{45}}\right)$	

ITEM NO	CLAUSE in [3]	DESCRIPTION	UNIT	Criteria	Score
B3		**Electrical requirements**			
B3.1	3.3.1.1	Electrical resistivity at 20°C (verified on test certificate)	Ωm	≤ 0.037 x 10^{-6}	5
				Non-compliant	0
Electrical requirements (maximum points: 5)				**Score**	
Electrical requirements (section weight: 20%)				**Weighted score =** $(\mathbf{Score}) * \left(\frac{\mathbf{20}}{\mathbf{5}}\right)$	

Note: If no test certificate has been submitted the applicable score for the item will be zero (0) irrespective of the value captured in schedule B.

ITEM NO	CLAUSE in [3]	DESCRIPTION	UNIT	Criteria	Score
B4		**Mechanical requirements**			
B4.1	3.3.2.1	Tensile Strength Test (verified on test certificate)	MPa	As specified	5
				Non-compliant	0
B4.2	3.3.2.2	0.2% Proof Stress Test (verified on test certificate)	MPa	As specified	5
				Non-compliant	0
B4.3	3.3.2.3	Elongation Test (verified on test certificate)	%	As specified	5
				Non-compliant	0
Mechanical requirements (maximum points: 15)				**Score**	
Mechanical requirements (section weight: 20%)				**Weighted score =** $(\mathbf{Score}) * \left(\frac{\mathbf{20}}{\mathbf{15}}\right)$	

Note: If no test certificate has been submitted the applicable score for the item will be zero (0) irrespective of the value captured in schedule B.

Annex C – In-Factory Product Assessment

Eskom	**SUBSTATION TUBULAR CONDUCTOR** **IN-FACTORY PRODUCT ASSESSMENT CHECK SHEET**

MAIN REPRESENTATIVES

Company			Country	
Eskom	Name		Signature	
	Designation		Date	
Tenderer	Name		Signature	
	Designation		Date	
Factory	Name		Signature	
	Designation		Date	

PRODUCT EVALUATED

Outside Diameter (mm)	**Wall Thickness (mm)**	**Tube length (m)**

INSPECTION SUMMARY

Item	**Inspection Criteria**	**Eskom Standard Clause in [3]**			**Eskom Comments**
		Clause	**Page**	**Comply**	

Annex D – Factory Assessment

Eskom	**SUBSTATION TUBULAR CONDUCTOR** **FACTORY ASSESSMENT CHECK SHEET**

MAIN REPRESENTATIVES

Company					Country			
Eskom	Name		Designation		Signature		Date	
Tenderer	Name		Designation		Signature		Date	
Factory	Name		Designation		Signature		Date	

D1 WORK SYSTEMS

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D1.1	Works procedures and instructions: a. What work procedures are in place? b. What ISO standards are used?	Both in place and documents are traceable	5	
		Both in place, but documents non-traceable	4	
		Either ‘a’ or ‘b’ are omitted	2	
		None	0	
D1.2	Continuous improvement and International compliance: Do they fully comply with EN 755?	Full compliance	5	
		Partial compliance	4	
		Non-compliance	0	

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D1.3	QMS documented and applied? QCP documented and applied? (choose one of each)	QMS and QCP's in place and traceable	5	
		QMS and QCP's in place	4	
		QMS and some QCP's in place	1	
		None in place	0	
D1.4	Quality inspections, audits and reviews: Separately list all inspections, audits and reviews done. (choose one of each)	All inspections, audits and reviews in place, up to date and traceable	5	
		All inspections, audits and reviews in place	4	
		Some inspections, audits and reviews in place	2	
		None in place	0	
D1.5	Staff training and accreditation systems and controls: What training is offered to staff? Who are they accredited with? (choose minimum 2 random staff members and question)	Staff trained and accredited, and traceable	5	
		Staff trained and accredited, not traceable	4	
		Staff trained	2	
		Staff not trained	0	
D1: WORK SYSTEMS SCORE (maximum 25)				

D2 OPERATION – MANUFACTURING METHODS

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D2.1	Quality assurance and verification of base material	Material quality checked, handled, stored and catalogued correctly, and is traceable	5	
		Material quality checked, handled, stored and catalogued correctly	4	
		Some of the above not complied to	2	
		No traceability of base material, or stored incorrectly	0	
D2.2	Clean conditions in workshop/factory	Clean-room environment (dust free, static free)	5	
		Workshop is clean overall	4	
		Workshop is fairly clean	2	
		Workshop not clean	0	
D2.3	What is the quality and availability of test reports?	Test certificate has all relevant data, easy to read and understand, signed off by authorised personnel and is traceable	5	
		Test certificate has all relevant data, easy to read and understand, signed off by authorised personnel	4	
		Test certificate has relevant data, not signed off by authorised personnel	0	
		No test certificates are available	0	

Item	Evaluation aspect	Criteria	Score	Evidence and comments
Item	**Evaluation aspect**	**Criteria**	**Score**	**Evidence and comments**
D2.4	What is the supplier's estimate of current capacity limit?	Can meet on time delivery for Eskom requirements	5	
		Some potential delays for the production of Eskom requirements	4	
		Major delays anticipated	0	
D2.5	Are there any bottlenecks in the manufacturing process? (e.g., test bay, material supply, extrusion, etc.)	Can meet on time delivery for our units	5	
		Some potential delays for the production of our unit	4	
		Major delays anticipated	0	
D2.6	Does the supplier intend to make use of a substitute factory if capacity increase is required? If so, has it been disclosed to and evaluated by Eskom?	No	5	
		Yes, fully accredited	4	
		Yes, not accredited yet	0	
D2.7	How will the supplier expedite orders if required?	Adequate process to fast-track orders, and is traceable	5	
		Adequate process to fast-track orders	4	
		Process exists, but needs improvement	2	
		No process	0	

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D2.8	Product compliance to specifications.	Aligns completely to Eskom standars	5	
		Partially aligns to Eskom specifications	4	
		Doesn't align to Eskom specifications	0	
D2.9	What are factory failure rates for the last 5 years?	Less than 1%, and traceable	5	
		Less than 1%	4	
		Between 1 – 2%	2	
		Greater than 2%	0	
D2.10	What processes are in place to handle failures?	Adequate process, and is traceable	5	
		Adequate process	4	
		Process exists, but needs improvement	2	
		No process	0	
D2: OPERATION – MANUFACTURING METHODS SCORE (maximum 50)				

D3 TECHNICAL INFRASTRUCTURE

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D3.1	What manufacturing equipment/tools does the supplier have, who manufactures this equipment, what is the capacity of this equipment?	Equipment/tools bought from accredited and known manufacturers, and traceable	5	
		Equipment/tools bought from accredited and known manufacturers	4	
		Some equipment/tools bought from accredited and known manufacturers	2	
		Equipment/tools bought from unrecognised manufacturers	0	
D3.2	How are supervisors and employees trained on handling equipment?	Certificate or accreditation, and traceable	5	
		Certificate or accreditation	4	
		Some workers accredited, certified	2	
		No certificate or accreditation	0	
D3.3	What is the maintenance operating model for the production line?	Complete maintenance procedures and records, and traceable	5	
		Complete maintenance procedures and records	4	
		Incomplete maintenance procedures and records,	2	
		Limited/no maintenance procedures or records	0	
D3: TECHNICAL INFRASTRUCTURE SCORE (maximum 15)				

D4 DESIGN PRACTICES AND APPLICATIONS

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D4.1	Describe your design criteria basis and guidelines: Electrical and Mechanical	Specific software/ tools for designs are in place and used	5	
		Software/tools are available, however no clear philosophy on how it should be used	2	
		Have tools only, no philosophy	0	
D4.2	Provide design process flowchart / systems for similar products	Up to date flowchart	5	
		Flowchart not current	2	
		No flowchart	0	
D4.3	How is internal design verification/validation ensured as part of the design process?	Authorised person checks and signs off design	5	
		No checks, self-release	0	
D4.4	What is the process to deal with design change requests, internal or external?	Formalised process, and traceable, including updating of manufacturing plan and schedules	5	
		No formal process	0	
D4.5	How is the final/approved design linked to the manufacturing process?	Approved inspection and test plans includes hold points to verify execution of design	5	
		No monitoring system	0	

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D4.6	How does the system flag excursions outside internal design rules?	Flags excursions, calibration is current	5	
		Flags some but not all excursions	4	
		No excursions flagged, not calibrated properly	0	
D4.7	How do you support/co-ordinate external partners for component manufacturers, if any?	Clear functional role, responsibilities and collaboration with suppliers	5	
		None	0	
D4: DESIGN PRACTICES AND APPLICATIONS SCORE (maximum 35)				

D5 TESTING FACILITY AND PRACTICES

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D5.1	Provide proof of calibration of all test equipment	Calibrated by accredited person/institution within date and traceable	5	
		Calibrated by accredited person/institution within date	4	
		Calibrated within date	2	
		Not calibrated	0	
D5.2	Dimensional requirements	Within requirements and traceable	5	
		Not within requirements	0	
D5.3	Electrical requirements	Within requirements and traceable	5	
		Not within requirements	0	

Item	Evaluation aspect	Criteria	Score	Evidence and comments
D5.4	Mechanical requirements	Within requirements and traceable	5	
		Not within requirements	0	
D5.5	Smoothness requirements	Within requirements and traceable	5	
		Not within requirements	0	
D5.6	Test capabilities	Fully capable of performing type, acceptance and routing tests, and is traceable	5	
		Fully capable of performing acceptance and routing tests, and is traceable	4	
		Capable of performing acceptance and routing tests	2	
		Cannot perform any tests	0	
D5.7	Reports, timeousness, quality thereof	All test reports produced immediately, checked by accredited person, and is traceable	5	
		All test reports produced immediately, and is traceable	4	
		Test reports produced	2	
		No test report available	0	
D5.8	List all in-house type tests done			
D5: TESTING FACILITY AND PRACTICES SCORE (maximum 35)				

Criteria	Section	Maximum score	Achieved score
Work systems	D1	25	
Operation – manufacturing methods	D2	50	
Technical infrastructure	D3	15	
Design practices and applications	D4	35	
Testing facility and practices	D5	35	
	Total	**160**	
		Percentage obtained = $\left(\frac{Achieved\ Score}{160}\right) * 100$	

Factory threshold: The minimum score required to be considered as a supplier must be 90% or above.

Annex E – Factory and Product Assessment Evaluation Agreement

Eskom	**SUBSTATION TUBULAR CONDUCTOR** **FACTORY PRODUCT and ASSESSMENT EVALUATION AGREEMENT**

Item	**Deviation Description**	**Response**	**Tenderer**		**Factory**		**Eskom**		**Target Date**
			Agree	**Disagree**	**Agree**	**Disagree**	**Agree**	**Disagree**	

MAIN REPRESENTATIVES

Company					Country			
Eskom	Name		Designation		Signature		Date	
Tenderer	Name		Designation		Signature		Date	
Factory	Name		Designation		Signature		Date	