Eskom	Standard	Technology

Title: **OUTDOOR POST AND LONG ROD INSULATORS FOR NEW AND REFURBISHED POWERLINES FOR 66KV AND 132KV STANDARD**

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Date: 31 Mar 2021

PCM Reference: **240-151017656**

SCOT Study Committee Number/Name: **Dx Insulator Care Group**

Content

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Tables

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1. Introduction

The original revision of this specification was produced after a series of meetings and discussions with all Distribution Group users, suppliers and manufacturers. Their contributions have been of great value and are greatly appreciated.

This specification has been produced in order to rationalize and achieve maximum standardization of the use of insulators in the Eskom Distribution Group.

Certain electrical and mechanical characteristics are fixed in order to achieve standardization. For those parameters, which can be varied, the preferred values are quoted.

The specification has been structured in a way that enables future insulator specifications to be added at a later stage, for example, line equipment insulation.

It is intended that the insulators specified in this document are used for the construction of all new or refurbished overhead lines. The connecting lengths and end fittings specified are critical and deviation from these and the tolerances provided will result in an offer not being considered.

Glass cap and pin type insulators should be procured using specification TRMSCAAA3.

Outdoor post and long rod insulators for new and refurbished powerlines up to 33kV should be procured using the specification 34-1677.

The procurement of insulators for maintenance purposes can be achieved using this specification. Insulators for maintenance may not have standard connecting lengths and/or standard end fittings as specified in this specification. In these cases this specification must be used as a basis for most requirements whilst specifying the particular connecting lengths and/or end fittings for the maintenance insulators required.

2. Supporting clauses

2.1 Scope

This specification covers the technical requirements for post and long rod insulators for use on Eskom's overhead 66 kV and 132 kV distribution lines. All insulators covered in the specification shall be class A. Details of particular requirements will be given in schedule A of an enquiry document. 88 kV insulators are supported for existing installations only and not for new installations.

2.1.1 Purpose

This specification has been produced in order to rationalize and achieve maximum standardization of the use of insulators in the Eskom Distribution Group.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

2.2 Normative/informative references

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the edition indicated was valid. All controlled documents are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent edition of the documents listed below. Information on currently valid national and international standards and specifications can be obtained from the Information Centre and Eskom Documentation Centre at Megawatt Park.

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2.2.1 Normative

[1] IEC 60372: Locking devices for ball and socket couplings of string insulator units: Dimensions and test.

[2] IEC 60437: Radio interference test on high voltage insulators

[3] IEC 61952: Composite line post insulators for a.c. overhead lines with a nominal voltage greater than 1000 V – Definitions, test methods and acceptance criteria.

[4] IEC 60120: Dimensions of ball and socket couplings of string insulator units

[5] IEC 60383-1: Insulators for overhead lines with a nominal voltage above 1000 V Part 1 Ceramic or glass insulator units for a.c. systems — Definitions, test methods and acceptance criteria

[6] IEC 60383-2: Insulators for overhead lines with a nominal voltage above 1000 V Part 2 Insulator strings and insulator sets for a.c. systems — Definitions, test methods and acceptance criteria

[7] IEC 60815: Guide for the selection of insulators in respect of polluted conditions

[8] EC 61109; Composite insulators for a.c. overhead lines with a nominal voltage greater than 1000V — Definitions, test methods and acceptance criteria.

[9] SO 1461: Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods.

[10] 240-75906867 (DGL_34-550): storage, transport and handling of composite insulators guideline.

[11] 240-75881756 (DPC_34-213): KIPTS Natural ageing and pollution performance tests procedure for outdoor insulator products section 1 – particular requirements for post, long rod and stand-off insulators.

[12] TRMSCAAA3 Ceramic and glass cap and pin insulators

[13] ESKASAAU7: Quality requirements for the procurement of quality related assets, goods and services

2.2.2 Informative

None.

2.3 Definitions

2.3.1 General

Definition	Description
Braced line post insulator	A braced line post is a horizontal line post equipped with an additional long rod insulator attached between its live end and the structure in such a way as to relieve the post of the downward cantilever load. This may be necessary to accommodate the increasing bending moments associated with long post insulators, heavy conductor bundles or increased weight span lengths. The normal downward acting cantilever forces are converted to tensile force in the brace and compressive force on the horizontal insulator.
Cantilever load	A load applied at the conductor position on the insulator, perpendicular to the conductor, and perpendicular to the longitudinal axis of the insulator. This load is also commonly called “bending” load.
Certified test report	A certificate of tests Accepted within the specification and carried out by an accredited authority.
Chips pits or blisters	Surface marks of insulator shed material usually caused during the manufacturing process.

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Definition	Description
Class A insulator	an insulator or insulator unit in which the length of the shortest puncture path through solid insulating material is at least equal to half the arcing distance
Composite insulator	An insulator made of at least two insulating parts, namely a core and a housing equipped with end fittings. Composite insulators, for example, can consist either of individual sheds mounted on the core, with or without an intermediate sheath, or alternatively, of a housing directly moulded or cast in one or several pieces on to the core
Connection zone	The connection zone is where the load is transmitted between the rod and the metal fitting.
Core(of a composite insulator	The core is the internal insulating part of a composite insulator and is designed to ensure the mechanical characteristics. The core usually consists of glass fibres which are positioned in a resin-based matrix.
Coupling	The part of the metal fitting that transmits the load to the line hardware external to the composite insulator
crack	A surface fracture greater than 0,1 mm deep.
Creepage distance	The shortest distance or sum of the shortest distances measured along the contours of the external surfaces of the insulating parts between those parts of an insulator that normally have the operating voltage between them
delamination	The loss of bonding of fibres to the matrix.
Flashover	A disruptive discharge external to an insulator between those parts of the insulator that normally have the operating voltage between them
horizontal	An insulator with base and end metal fittings, which is mounted horizontally onto a structure.
Housing	The external part of an insulator that provides the necessary creepage distance and protects the core from exposure to the weather. An intermediate insulating sheath is part of the housing.
Insulator	A device that provides both electrical insulation and mechanical linkage between live conductor and an earth point
Maximum design cantilever load(of horizontal posts)(MDCL)	The load above which damage to the core begins to occur and which is the ultimate limit for service loads. The manufacturer/supplier specifies this value.
Mental fitting of a composite insulator	Devices that form part of a composite insulator and intended to connect it to a supporting structure or to a conductor. The two fittings referred to in this specification are the earth end and a line or live end.
Shed	A projecting portion of the housing (see 3.1.175) intended to increase the creepage distance.
Specified mechanical load(of long rod insulator)(SML)	The load specified by the manufacturer/supplier which is used for mechanical tests. It forms the basis for the selection of long rod insulators.
Visual inspection	An inspection carried out by a competent person sufficiently experienced to identify any signs indicating anything detrimental to the insulator's performance.

2.3.2 Disclosure classification

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

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2.4 Abbreviations

Abbreviation	Description
EPDM	ethylene propylene diene monomer: A polymeric material used for the manufacture of housings.
ESP	enhanced silicone polymer: A polymeric material used for the manufacture of housings.
KLIPTS	Koeberg insulator pollution test station
STP	standard temperature and pressure: standard temperature = 273,15 K and standard atmospheric pressure = 1,013 x 105Pa

2.5 Roles and responsibilities

Not applicable.

2.6 Process for monitoring

Not applicable.

2.7 Related/supporting documents

Not applicable.

3. Requirements

3.1 General

Nothing in this specification shall lessen the obligations of the supplier as detailed in any other documents forming part of a contract. The insulators shall be designed, manufactured and tested as specified herein and in schedule A of an enquiry document.

3.2 Insulator manufacture/supplier

The manufacturer/supplier shall have access to the engineering facilities necessary to provide a technical service and information, advice and after-sales service related to the products under consideration.

The manufacturer/supplier may be requested to provide a list of references indicating the country, name of the customer, system voltage, quantity and year of delivery for substantial previous orders. Comparison of these details with the type of insulator being offered against the enquiry is required. This information shall be made available as a hard copy or in a software format.

3.3 Insulator acceptance and tenders

Only insulators that have been evaluated and accepted by Eskom will be added to the acceptance list published on the IARC website.

The supplier shall be fully responsible for his designs and their satisfactory performance in service. Acceptance by Eskom shall not relieve the supplier of his responsibility for the adequacy of the design, dimensions and details.

Manufacturers'/supplier's catalogues shall not refer to any product as "Eskom approved or accepted". Eskom may only be mentioned as a reference.

All evaluation submissions shall be made electronically.

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3.4 Quality system

Quality assessment will be done in conjunction with the technical acceptance. This shall not override any quality requirements that are specified in a contract document.

3.5 Samples

Samples of insulators shall be submitted in accordance with the evaluation process.

3.6 Drawings

Each acceptance package shall include one copy of the general arrangement drawings of the insulator offered.

The drawings shall clearly show the following information:

- Dimensions and tolerances, including end fittings.
- Material description, mass and fabrication details.
- Specified mechanical load or maximum design cantilever load.
- Supplier's catalogue numbers.
- Location and description identification markings.

Notes:

1) Drawings must be supplied in an electronic *.dxf, *.pdf or in word format.

2) For post insulators provide an attachment of combined loading curves.

3.7 Insulation material

Only insulation materials that have passed the Natural Ageing and pollution performance test 240-75881756 (DPC_34-213) at Koeberg insulator pollution test station (KIPTS) and have a recognized service history will be acceptable.

3.8 Creepage

The minimum specific creepage distances at Umax required by this specification for the two pollution zones Eskom distribution has adopted for use on distribution lines are as follows:

20 mm/kV for line insulators used in Light and Medium (LM) pollution zones.

31 mm/kV for line insulators used in Heavy and Very Heavy (HVH) pollution zones e.g. Cape West Coast, Natal North Coast, parts of Zululand, Sasolburg etc.

3.9 General electrical and mechanical characteristics

All insulators shall comply, as a minimum, with the parameters laid out in table 1(a) and 1 (b).

Table 1: Longrod electrical and mechanical characteristics

1	2	3	4
Characteristic	**Highest system voltage 72,5 kV**	**Highest system Voltage 100 kV**	**Highest system Voltage 145 kV**
Rated lightning impulse withstand voltage kV, peak at STP.(BIL)	350	450	650

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Characteristic	Highest system voltage 72,5 kV	Highest system Voltage 100 kV	Highest system Voltage 145 kV
Rated short duration wet power frequency withstand voltage r.m.s. , kV	140	185	275
Minimum distance between end fittings (mm)	900 OR 880 ±20*	730	1200
Connecting Length (mm)		1000 ±20	1480 ±20
End fitting – Live end	IEC 60120 Ball 16	IEC 60120 Ball 16 Or Oval eye	IEC 60120 Ball 16
End fitting – Earth end	IEC 60120 Socket 16 A	IEC 60120 Socket 16 A Or Tongue	IEC 60120 Socket 16 A
Failing Load (long rod) - (minimum) (kN)	120	120	120
Specific creepage mm/kV Umax Light – Medium Heavy – Very Heavy	 20 31	 20 31	 20 31

Two optional lengths are given for 66 kV insulators: a 900 mm between fittings or 880 mm connecting length. The first measurement between end fittings is to satisfy a live line requirements and the later is the connecting length for a six disc equivalent insulator. Both characteristics can not be realised in one unit. There the two different requirements have been issued different SAP numbers.

Table 2: Post electrical and mechanical characteristics

1	2	4
Characteristic	**Highest system voltage 72,5 kV**	**Highest system Voltage 145 kV**
Rated lightning impulse withstand voltage kV, peak at STP.	350	650
Rated short duration wet power frequency withstand voltage r.m.s. , kV	140	275
Post end fitting – Live end	Trunnion or 2 hole drop eye	Trunnion or 2 hole drop eye
Post end fitting – Earth end.	Gain base/ Square base	Gain base/ Square base
Maximum design cantilever load kN.(post)	5,3	5,3
Minimum horizontal distance between conductor and pole, mm	900	1300
Specific creepage mm/kV Umax Light – Medium Heavy – Very Heavy	 20 31	 20 31

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Note: A horizontal post insulator, when subjected to the maximum design cantilever load, shall not deflect vertically downward beyond the horizontal. This is of extreme importance as conductor height is taken as the insulator horizontal position. Post insulators for 88 kV are not required.

3.10 Shed Designs

Sheds with an open aerodynamic profile are preferred. Under ribbed designs are not acceptable. Insulator shed profiles shall be designed in accordance with IEC 60815.

The insulator's shed diameter shall not be greater than 255 mm. Sheds shall be strong enough to withstand the expected handling stresses. In the case of non-ceramic insulators the sheds shall maintain their shape during handling storage and in-service operation.

Handling, storage and precautionary installation equipment and information shall be made available for insulator products offered on request.

3.11 Mechanical strength

The cost of standardizing horizontal post insulator cantilever strength is too high. Therefore the strength required per project may be a customized value other than 5,3 kN. However the standard maintenance stock for all lines shall be a standard insulator cantilever strength 5,3 kN.

3.12 Post insulator

All ferrous fittings shall be hot dip galvanized.

Insulators manufactured from glazed porcelain shall comply with IEC 60383-1 and its testing requirements. Composite insulators shall comply with IEC 61952 and it's testing requirements.

3.12.1 Earth End

The earth end base shall be manufactured from malleable cast, ductile iron or aluminium. The insulator shall be angled such that under MDCL the insulator does not bend below the horizontal.

The insulator base shall suit the pole mounting shown in D-DT-7330.

The gain base shall not use more than 75 mm of the fixing bolt length when mounted on a round structure.

The choice of iron or aluminium material for end fittings remains with the purchaser

3.12.2 Live End

This fitting shall be one of three following end fittings (to be selected by purchaser by choosing the appropriate SAP):

a) a trunnion suitable to accommodate a trunnion clamp with formed armour rods,

b) a two hole drop eye for attaching a suspension clamp a jumper clamp or an armour grip suspension unit. The tongue shall be dimensioned to accept attachments that are in accordance with IEC 60471-20 L.

c) a 'F' neck insulator may be required under special circumstances. When required, it will be specified in schedule A. (Typically for lower voltage insulators and therefore no SAP number is made available)

The live end fitting of the insulator shall be iron or forged steel. The trunion clamp may be aluminium.

The end fittings shall be designed, manufactured and connected to the insulator in such a manner that ingress of moisture or other contaminating elements are prevented throughout the life of the insulator.

3.13 Long rod insulators

Locking devices shall be in accordance with IEC 60372. The preferred locking devices shall be of the hump backed split pin type (termed split pins in IEC). The preferred material is stainless steel.

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3.13.1 Ceramic long rod insulators

The insulators shall be glazed porcelain and shall comply with IEC 60383-1.

The end fittings manufactured from ductile iron or malleable cast iron shall be galvanized to comply with ISO 1461.

Ceramic long rod insulators shall be supplied with Arcing horns.

3.13.2 Composite long rod insulators

Accepted composite insulators consist of a core, housing (including weather sheds and sheath, where applicable) and metal end fittings. The core, which provides the strength, shall be an acid resistant glass fibre reinforced rod. The housing is the external insulating part of the insulator and provides the necessary creepage distance.

All other composite insulators design philosophies shall be submitted to the Insulator Work Group for approval.

Long rod insulators shall be designed, manufactured and tested in accordance with IEC 61109 with exception of accelerated aging tests in Annex C. The natural ageing tests shall be completed on all insulators at KIPTS in accordance with 34-213. Annex C of IEC 61109 is no longer an acceptable equivalent for the testing completed at Koeberg High voltage test facility.

Corona rings are required for 132 kV insulators where corona is present on end fittings. If corona rings are required for a particular design then the ring shall be incorporated into the end fitting.

Only insulators that do not contribute to radio interference voltages at a test voltage of 1,1 x Um/√3 shall be supplied (see 5.1.4).

Insulation materials shall be at least 3 mm thick. The insulator design shall ensure that the core is totally sealed.

Insulators affected by chips, pits or blisters in any part of the housing, with the exception of sheds, will be rejected. Chips, pits and blisters, if they only affect sheds, as well as scratches and shrink marks will be accepted, provided that each single defective area is less than 25 mm2 and its depth less than 1 mm. Moreover, the total defective area shall not exceed 0, 2 % of the whole composite insulator surface.

3.14 Identification

The insulator shall be permanently marked with the following information:

a) manufacturer’s name or trademark;

b) specified mechanical load or maximum design cantilever load;

c) type or model number; and

d) batch number.

The markings shall be legible and durable. Markings on sheds or housing shall remain legible following the KIPTS Tests and during the life of the insulator.

The batch date may be displayed on a permanently fixed pigeon ring type label to the earth end fitting if this suits the manufacturing process. The batch date shall at least show the year and month the batch was produced.

For porcelain insulators, the markings shall be a transfer that is fired into the glaze of the top shed.

For composite insulators, the markings shall be indelibly marked, moulded or engraved in or on the material of the insulator or on the end fittings.

3.15 Packing

Details of the proposed packaging method shall accompany a tender offer and shall be subject to Eskom approval.

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The packaging shall protect the insulator from the normal handling that can be expected from the point of despatch to the point of construction.

Any special handling requirements shall be clearly specified to purchaser before delivery and shall be clearly specified on packaging.

The packaging shall be capable of protecting the insulators for sustained periods in storage. The manufacturer/supplier shall notify the purchaser of any special methods recommended for storage before delivery and on packaging materials.

The packaging shall not disintegrate due to any wetting and drying that may occur during the line construction.

The deliverer shall, at his expense, at Eskom's discretion, replace insulator units that are damaged during transit due to the delivery negligence. The manufacturer/supplier shall, at his expense, at Eskom's discretion, replace insulator units that are damaged due to unsuitable packaging. This includes the chipping of glazed surfaces.

If insulators are packed in boxes or crates on pallets, the gross weight of the pallets shall not exceed 1800 kg.

Pallets shall be suitable for handling by fork lift trucks, capable of two-way entry and be reversible.

All boxes, pallets or containers shall be numbered and marked in accordance with the following example:

Project name		Suppliers name
(If applicable)		
Project number	Delivery address	
(If applicable)		
	Eskom	
	Order number	
	Description of material	
	Gross weight	

3.16 Storage ,transport and handling

Storage, transport and handling of insulators shall adhere to 240-75906867

4. Tests

4.1 General

All post and long rod insulators manufactured shall be visually examined for defects by the supplier, before any tests are carried out and packaging takes place.

Defective insulators shall be marked with a permanent marker and discarded.

Test certificates showing results of production routine tests, shall be retained by the supplier and shall be available for Eskom's inspection.

At its discretion, Eskom reserves the right to subject randomly selected insulators that have been delivered to site, to qualifying design or type tests. The costs of such testing shall be for Eskom's account only for those insulators that pass the tests. However, for the insulators that fail these tests, the cost shall be for the supplier's account. Failure to pass qualifying design tests will result in rejection of all insulators from the supplier, until the problem is satisfactorily resolved.

4.1.1 Test certificates

Certificates of type tests performed by a test authority acceptable to Eskom shall be submitted with an evaluation offer unless Eskom waives this requirement due to a previous evaluation of the product. The test certificate for any insulator shall be easily traced by reference to the insulator markings.

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4.1.2 Natural ageing and pollution performance testing

All insulators shall undergo “natural ageing and pollution performance testing” according to procedure 34-213 at the Koeberg insulator test station in place of IEC 61109 and IEC 61952 accelerated weathering tests. The period of test shall be:

- 6 months for Light to Medium Zone insulators or
- 12 months for Heavy to Very Heavy Zone insulators

Both test periods start in May of each year and can not start at any other time during the year.

4.1.3 Radio interference voltage

Insulators shall be free from radio interference voltages when subjected to a test voltage of 1,1 x Um/√3 using the test procedure IEC 60437 and test assembly of IEC 60383-2.

4.2 Post insulators

Ceramic post insulators shall be tested in accordance with IEC 60383-1.

Composite post insulators shall be tested in accordance with IEC 61952. In addition an interface integrity test (6.4) and an electrical routine test (6.5) are required as part of the testing plan for composite post insulators.

Pollution performance tests shall completed on both Ceramic and composite insulators.

4.3 Long rod insulator

Ceramic long rod insulators shall be tested in accordance with IEC 60383-1.

Composite long rod insulators shall be tested in accordance with IEC 61109, with the exceptions of:

a) the tracking and erosion type test given in 11.1.2 which is replaced by 240-75881756 (DPC_34-213).

b) the brittle fracture resistance type test (6.3.1) shall also be completed on all composite longrod insulators utilising a fibre rod.

c) the electrical routine test (6.4) shall be completed on all composite longrod insulators utilising a fibre rod.

d) the interface integrity test (6.5) shall be completed on all composite longrod insulators utilising a fibre rod.

4.3.1 Brittle fracture resistance test

Complete the assembled core load time test with container that contains 1N-HNO3 concentrated acid that is applied at the naked rod. The rod should be held at 40 % of SML for the duration of the test.

The rod should not fail within the 96 hour test duration. The temperature shall be held at 20° ± 5 for the duration of testing.

4.4 Electrical routine testing

Electrical testing is required to confirm the integrity of the insulation across the insulator.

Note: If the testing cannot be completed at nominal AC voltage, due to the un-availability of equipment to complete the test, then an alternative voltage to do the test can be submitted for acceptance to the Insulator working group.

4.4.1 Procedure

Apply the nominal AC voltage between the two ends of the insulator. With the voltage applied measure the leakage current or impedance across the insulator. The test is to be conducted until an acceptable constant reading is acquired.

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4.4.2 Acceptance criteria

An impedance above 1000 MΩ is required or as agreed between the buyer and the supplier.

4.5 Interface integrity

5. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Amish Roopnarain	Engineer Electrical
Gavin Strelec	Chief Engineer Electrical
Riaz Vajeth	Senior Manager Lines Engineering Services

6. Revisions

Date	Rev	Compiler	Remarks
March 2021	2	Amish Roopnarain	Document formatted onto latest SCOT template. No content change.
March 2016	1	Amish Roopnarain	Document formatted onto new template. New 240 number created which supersedes DSP 34 - 510. No content change.
Feb 2014	1	Gavin Strelec	No change in content, change in format. This document supersedes document number DSP_34-510 Compiler changed from G Stanford to Gavin Strelec Approver changed from RA Branfield to Raphael Swinny Authoriser changed from MN Bailey to Riaz Vajeth
July 2010	1		Reformatted By: V Singh and B Morrison Document re-formatted on a new template. No Technical changes The previous version was compiled in March 2007 by G Stanford

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Date	Rev	Compiler	Remarks
March 2007	0		1. Scope included 88 kV insulators and notes. 4.3 Renamed to insulator acceptance in line with new process. Removed reference to old insulator evaluation process. 4.4 Removed reference to old specifications and the old insulator evaluation process. 4.5 Removed reference to old insulator evaluation process. 4.6 Revised tender and approval to acceptance package. Updated the electronic files that can be submitted to allow pdf and word files. Updated the load curves to combined load curves. Table 1a revised the ball and socket requirements to type A fittings based on last evaluation. Added 88 kV measurements. Table 1 b revised MDCL to only 5.3 kN as per the buyers guides. Revised 66 kV post length from 780 mm to 900 mm in line with live line requirements given by the live line team. Added note to the effect that posts are not required for 88 kV. 4.11 Corrected the MDCL values. 4.12.1 b) Corrected fitting sizes in line with MDCL strengths available. 5.4 Included a note with respect to submitting alternative test voltage for test. Document reference number changed from DISSCABI9 to 34-510 and SCSPVAI4 to 34-213.
Nov 2005	1		Include interface integrity and electrical routine test for composite insulators IEC 61952 has been published. Therefore tests are now defined by this specification. ANSI C29.1 removed from references and test section 5.2. References and 5.2 updated to reflect IEC 61952 testing requirement. 4.8 Interim materials requirements for cyclo aliphatic, EPDM and ESP removed. KIPTS test is only requirement for insulator with different materials. The specific unit will be accepted based on a KIPTS pass. Table 1a included a 900 mm metal to metal unit. 4.10 Added “Under ribbed designs are not acceptable.” 4.13 Added “Locking devices shall be in accordance with IEC 60372. The preferred locking devices shall be of the hump backed split pin (termed split pins in IEC). The preferred material is stainless steel.” 5.1.3 Added SCSPVACI4 procedure for testing at KIPTS. 5.1.4 Included the testing procedure IEC 60437 for RIV testing. 5.3.1 Brittle fracture test to be done at a minimum of 40 % of SML instead of 80 % in line with international trends. Document reference number changed from SCS to DIS

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Date	Rev	Compiler	Remarks
Feb 2002	0		Original issue- Split SCSSCAAG9 and SCSSCAAN9 into MV and HV insulators. MV insulators moved to SCSSCABI8. The approval document moved to SCSSCABI7. Decision to split documents taken at IWG. Various small corrections made to document to bring the document in line with insulator handling guide SCSAGAAS3. Connecting length and live line issues decided

7. Development team

- Amish Roopnarain

8. Acknowledgements

Not applicable.

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Annex A – Impact Assessment

Impact assessment form to be completed for all documents.

1) Guidelines

- All comments must be completed.
- Motivate why items are N/A (not applicable)
- Indicate actions to be taken, persons or organisations responsible for actions and deadline for action.
- Change control committees to discuss the impact assessment, and if necessary give feedback to the compiler of any omissions or errors.

2) Critical points

2.1 Importance of this document. E.g. is implementation required due to safety deficiencies, statutory requirements, technology changes, document revisions, improved service quality, improved service performance, optimised costs.

Comment: Document re-formatted and re-numbered.

2.2 If the document to be released impacts on statutory or legal compliance - this need to be very clearly stated and so highlighted.

Comment: N/A

2.3 Impact on stock holding and depletion of existing stock prior to switch over.

Comment: N/A

2.4 When will new stock be available?

Comment: N/A

2.5 Has the interchangeability of the product or item been verified - i.e. when it fails is a straight swop possible with a competitor's product?

Comment: N/A

2.6 Identify and provide details of other critical (items required for the successful implementation of this document) points to be considered in the implementation of this document.

Comment: N/A

2. Provide details of any comments made by the Regions regarding the implementation of this document.

Comment: (N/A during commenting phase)

3) Implementation timeframe

3.1 Time period for implementation of requirements.

Comment: N/A

3.2 Deadline for changeover to new item and personnel to be informed of DX wide change-over.

Comment: N/A

4) Buyers Guide and Power Office

4.1 Does the Buyers Guide or Buyers List need updating?

Comment: N/A

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4.2 What Buyer's Guides or items have been created?

Comment: N/A

4.3 List all assembly drawing changes that have been revised in conjunction with this document.

Comment: N/A

4.4 If the implementation of this document requires assessment by CAP, provide details under 5

4.5 Which Power Office packages have been created, modified or removed?

Comment: N/A

5) CAP / LAP Pre-Qualification Process related impacts

5.1 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?

Comment: N/A

5.2 If NO, provide motivation for issuing this specification before Acceptance Cycle Expiry date.

Comment: N/A

5.3 Are ALL suppliers (currently accepted per LAP), aware of the nature of changes contained in this document?

Comment: N/A

5.4 Implementation of the provisions of this document required during the current supplier qualification period?

Comment: N/A

5.5 If Yes to 5.4, what date has been set for all currently accepted suppliers to comply fully?

Comment: N/A

5.6 If Yes to 5.4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

Comment: N/A

5.7 Can the changes made, potentially impact upon the purchase price of the material/equipment?

Comment: N/A

5.8 Material group(s) affected by specification: (Refer to Pre-Qualification invitation schedule for list of material groups)

Comment: N/A

6) Training or communication

6.1 Is training required?

Comment: (If NO then 6.2 – 6.6 will be N/A)

6.2 State the level of training required to implement this document. (E.g. awareness training, practical / on job, module, etc.)

Comment: N/A

6.3 State designations of personnel that will require training.

Comment: N/A

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6.4 Is the training material available? Identify person responsible for the development of training material.

Comment: N/A

6.5 If applicable, provide details of training that will take place. (E.G. sponsor, costs, trainer, schedule of training, course material availability, training in erection / use of new equipment, maintenance training, etc).

Comment: N/A

6.6 Was Technical Training Section consulted w.r.t module development process?

Comment: N/A

6.7 State communications channels to be used to inform target audience.

Comment: N/A

7) Special tools, equipment, software

7.1 What special tools, equipment, software, etc will need to be purchased by the Region to effectively implement?

Comment: N/A

7.2 Are there stock numbers available for the new equipment?

Comment: N/A

7.3 What will be the costs of these special tools, equipment, software?

8) Finances

8.1 What total costs would the Regions be required to incur in implementing this document? Identify all cost activities associated with implementation, e.g. labour, training, tooling, stock, obsolescence

Comment: N/A

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Impact assessment completed by:

Name: Vinod Singh_____

Designation: Power Plant Technologies Manager_____

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