Eskom	Standard	Technology

Title: **STANDARD FOR WIRING AND CABLE MARKING IN SUBSTATIONS**

Unique Identifier: **240-64636794**

Alternative Reference Number: **<n/a>**

Area of Applicability: **Engineering**

Next Review Date: **STABILISED**

COE Acceptance

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Date: 29/1/2019

DBOUS Acceptance

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Senior Manager

Date: 04/02/2019

This document is **STABILISED**. The technical content in this document is not expected to change because the document covers: *(Tick applicable motivation)*

1	A specific plant, project or solution	
2	A mature and stable technical area/technology	
3	Established and accepted practices.	X

PCM Reference: **PCM System Design 240 - 64636794**
SCOT Study Committee Number/Name: **PASC**

Eskom	Standard	Group Technology

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Date: 13/9/2013

PCM Reference: PTM&C

SCOT Study Committee Name: Protection & Automation Study Committee

Content

Figures

Tables

Foreword

Not applicable.

Revision history

This is a new document.

Date	Rev.	Compiled by	Clause	Remarks
Sept 2013	0	H Sithole	-	First issue.

Acceptance

This document has been seen and accepted by:

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Introduction

Protection, Telecoms, Metering and Control (PTM&C) has embarked on adoption of the IEC 61850 Standard when implementing protection and control schemes. National protection and control schemes enquiries based on the IEC 61850 Standard could not be effectively done using the existing set of enquiry documents such as scheme specification documents. This resulted in the compilation of this generic type of standard, which can be applied to different schemes.

The current suite of documents used to place contracts on traditional protection schemes designs is such that these documents do not simplify easy implementation of standardized protection and control schemes. Therefore, in order to fully implement and take advantage of the proposed standardized approaches to protection and control schemes, it was deemed prudent to review and restructure all existing protection-related documents such as specifications, standards and philosophies into at least six separate categories of documents, as follows:

- Standards/Philosophies documents
- Function specifications
- Product-specific equipment specifications
- Generic equipment specifications
- Standards for contract purposes

This *Standard for Wiring and Cable Marking in Substations* document is a typical generic equipment specification document dealing with wiring, wire marking and cable numbering. It is a consolidation of previously stand-alone standards and specifications documents pertaining to the wiring of control panels and cable marking.

This document is to be read in conjunction with [7] DSP 34-253, which specifies the technical requirements for electrical terminal blocks as used in control panels, junction boxes, and for wiring interfaces between control plant and power plant equipment (e.g. circuit-breaker mechanism boxes and transformer marshalling interface boxes).

This document is applicable to all control plant schemes and junction boxes and all power plant interface wiring.

Keywords

IEC 61850, Standardization, Control Wiring.

1. Scope

1.1 Purpose

This standard defines the Protection and Control discipline's requirements related to the wiring, wire marking and cable numbering of protection and control schemes. This entails wiring within control panels; inter-panel wiring; wiring at the interface between control and power plant equipment; and the numbering of cable runs from control panels to the yard equipment.

1.2 Applicability

This standard is applicable to all control plant schemes and junction boxes, and all power plant interface wiring.

This standard shall apply throughout the Transmission and Distribution Divisions of Eskom Holdings Limited.

2. References

Parties using this document shall apply the most recent edition of the following documents:

2.1 Normative references

2.1.1 International document(s)

Document number	Document title	Preparer/author	Revision or date of issue
[1] IEC 62491	Industrial systems, installations and equipment and industrial products – labelling of cables and core	IEC	Latest
[2] BSS 158	Numbering of lead wires	BSS	Latest

2.1.2 South African national document(s)

Document number	Document title	Preparer/author	Revision or date of issue
[3] SANS 1411	Materials of insulated electric cables and flexible cords	SANS	Latest
[4] SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3000 V)	SANS	2002
[5] SANS 1574	Electric cables – Flexible cords and flexible cables	SANS	Latest
[6] SANS 10142-1	The wiring of premises Part 1: Low-voltage installations	SANS	Latest

2.1.3 Eskom national document(s)

Document number	Document title	Preparer/author	Revision or date of issue
None			

2.1.4 Eskom divisional document(s)

Document number	Document title	Preparer/author	Revision or date of issue
[7] DSP 34-253	Distribution specification for electrical terminal blocks	Eskom	1
[8] DSP 34- 462	Generic specification for distribution protection schemes	Eskom	Latest
[9] DST 34_195	Standard drawing practice for CAD users in the power plant and control plant technologies environments and for electrification networks	Eskom	Latest
[10] 240-46263618	Labelling of fibre cables	Eskom	Latest
[11] 240-46264031	Fibre-optic design standard	Eskom	Latest

2.2 Informative references

Document number	Document title	Preparer/author	Revision or date of issue
[12] 32-9	Definition of Eskom documents	Eskom Document Centre	Latest
[13] 32-644	Eskom documentation management standard	Eskom Document Centre	Latest
[14] 474-65	Operating manual of the Steering Committee of Technologies (SCOT)	Vinod Singh	Latest
[15]	Options for the numbering of control wires within power plant equipment	S van Zyl	Latest

3. Definitions and abbreviations

3.1 Definitions

Definition	Explanation
Lug	Any Eskom-approved connector of any of the following configurations: wire pin, hooked blade, flat blade, spade, ring.

3.2 Abbreviations

Abbreviation	Explanation
AC	Alternating Current
AVC	Automatic Voltage Control
AVR	Automatic Voltage Regulator
CAP	Committee for Accepted Products
CT	Current Transformer
DC	Direct Current
HV	High Voltage
IDF	Intermediate Distribution Frame
LAP	List of Accepted Products

Abbreviation	Explanation
MCB	Miniature Circuit-breaker
MV	Medium Voltage
n/a	not applicable
PTM&C	Protection, Telecoms, Metering and Control
rms	root mean square
VT	Voltage Transformer

4. Requirements

4.1 Control wiring

a) General wiring used within the scheme shall comply with the requirements of [4] SANS 1507-2 for insulated copper wire and shall have a rated operating voltage of 600 V/1 000 V (phase-to earth/phase-to-phase). The wires shall have a minimum of 40 strands.

b) Reference [4] SANS 1507-2 requires that wiring insulated for 1 000 V phase-to-phase shall withstand 2 000 V for 10 min.

c) Wire used in Current Transformer (CT) circuits and for earth connections shall have a minimum cross-sectional area of 2,5 mm^2.

d) Wires for other applications shall have a minimum cross-sectional area of 1,5 mm^2.

e) Wire with less than 40 strands and more than seven strands or other minimum cross sections may be used with Eskom's prior approval.

f) CT and Voltage Transformer (VT) wires shall be colour-coded per phase: red, white, blue and black (neutral) as appropriate.

g) Earthing wires shall be colour-coded green/yellow. Wires for other applications shall be coloured grey.

4.2 Communication wiring

a) EIA-232 and EIA-485 communication circuits shall be wired using stranded wire (seven strands) of nominal (overall) cross-sectional area of 0,22 mm^2 arranged in shielded twisted pairs. Alternative wire types shall be subject to Eskom's approval.

b) EIA-485 circuit design shall be such as to facilitate application of the ports in a daisy-chain configuration without tee-offs from the backbone.

c) This cable shall be suitable for operation up to 300 V rms at frequencies up to 1,6 MHz and shall have a characteristic impedance, ZC, of 120 Ω.

d) The cable shall be suitable for application for EIA-485 data communication.

4.3 Installation of fibre-optic cables

a) To the extent possible, the installation and termination of fibre-optic cables within and between panels shall comply with provisions of [11] 240-46264031.

b) Ruggedized fibre-optic cables shall be used where applicable.

4.4 Labelling of fibre-optic cables

The labelling convention to be used for fibre-optic cables wiring within panels shall comply with the provisions of [10] 240-46263618.

4.5 Wiring identification

a) All wiring shall be identified using alphanumeric numbers, at each end, by slip-on ferrules.

b) All wiring shall be permanently marked with an approved type of marking device, with black letters impressed on a white background or black letters on a yellow background.

c) The marker colour shall be consistent throughout the panel and/or suite of panels.

d) Interlocking slip-on types of ferrules or one-piece markers in a slip-on sleeve may be used and shall match the size of wire onto which they will be fitted.

e) Self-adhesive types of identification are not acceptable.

f) For heavy conductors and very light telephone-type wiring where the preferred type of marking ferrule is not available, other methods will be subject to Eskom's prior approval.

g) Identification marks shall be orientated in accordance with Figure 1.

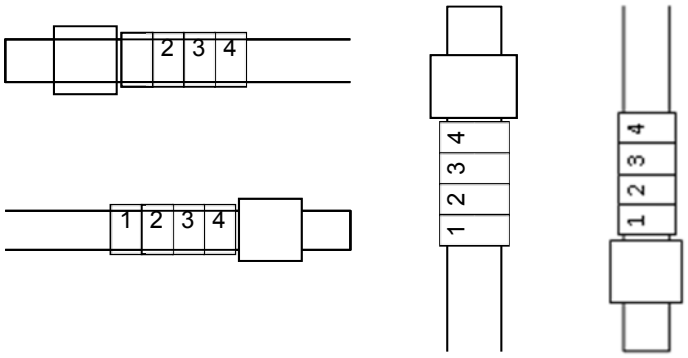


Figure 1: Correct orientation of wire markers per direction of termination

4.6 Lugs and terminal blocks

All terminal blocks and colour-coded lugs used for terminations shall be in accordance with [7] DSP 34-253.

4.7 Function identification of control wires

4.7.1 Circuit identification in schemes

The circuit function letters indicated in Table 1 shall, as a convention, be employed in all scheme designs.

Table 1: Circuit function letters

Letter	Description
A	Current transformers for primary protection
B	Current transformers for bus zone protection
C	Current transformers for secondary or backup protection

Letter	Description
D	Current transformers for metering and measurements
E	Reference voltage for instruments, metering and protection
F	Reference voltage for voltage control
G	Reference voltage for synchronizing
H	AC supplies and AC/DC supplies for motorized isolators and circuit-breakers
J	Primary DC supplies
K	Protection, closing and tripping circuits
L	Alarms and indication initiated by auxiliary switches and relay contacts excluding those for remote selective control and for general indication equipment
M	Auxiliary and control motor devices, governor motor, rheostat motor, generator Automatic Voltage Regulator (AVR) control, spring charging motors, transformer cooler motor control, motors for isolator operation
N	Tap-change control including Automatic Voltage Control (AVC), tap position and progress indication
P	DC tripping circuits used solely for busbar protection
R	Interlock circuits and Transfer circuits
S	DC instruments and relays, exciter and field circuits for generators
T	Pilot conductors between panels, independent of the distance between them, for pilot wire protection, for inter-tripping or for both
U	Spare cores and connections to spare contacts
W	Supervisory controls and analogues, energy pulsing
X	Supervisory alarms and indications
Y	Telephones

NOTE: Combined letters KL are used in breaker-and-a-half schemes where Secure Supply Circuits apply.

4.7.2 Wiring terminations

a) For the swing-frame panels with horizontal terminal strips, internal scheme wiring to terminal strips on the terminal back plate shall be connected to the lower side of the terminals and the cables shall be connected to the upper side.

b) For the fixed front-rear entry panels with vertical terminal strips, wiring shall be as follows:

   1) For the left terminal strip, internal scheme wiring to terminal strips on the inside of the panel shall be connected to the right side of the terminals and the cables shall be connected to the left side.

   2) For the right terminal strip, internal scheme wiring to terminal strips on the inside of the panel shall be connected to the left side of the terminals and the cables shall be connected to the right side.

c) The input circuits from the outside plant shall always be connected to the lower terminals of test blocks and the panel circuits shall always be connected to the upper terminals. When observed from the inside of the panel, the phase order of the connections shall be (from bottom to top) red, white, blue, neutral.

d) Wiring terminations shall be of such a length and executed in such a manner that the conductors are not subject to injurious tensile stresses or flexing, which might cause fatigue failure, whether as a result of vibration or otherwise.

e) Not more than two conductors shall be connected to any side of a terminal. Where two conductors are connected to a terminal, care shall be taken to ensure that lugs and ferrules are fitted to the conductors so as to allow the wires to approach the terminal as near parallel as possible.

4.7.3 Alternating current key diagrams

a) Secondary Alternating Current (AC) leads shall be prefixed as per their circuit identification letters. Red phase circuits shall be numbered from 10 to 29; White phase from 30 to 49; Blue phase from 50 to 69; and the residual/star point/neutral from 70 to 89. This applies for both current and voltage circuits.

b) The scheme wiring shall be numbered so as to permit the following standardized numbering of incoming wires from the substation yard:

   1) Current circuits: Red – x11; White – x31, Blue – x51, Residual – x71, Neutral – x80, x81, etc. where x is A, B, C or D as per 4.7.1.

   2) Voltage circuits: Red – x11; White – x31, Blue – X51, Neutral – x71, where x is E, F or G, as per 4.7.1.

   3) Where a scheme has current and/or voltage inputs from different voltage levels, the inputs from the highest voltage side will be numbered x11, x31, etc. Add 100 to each wire number for each successive lower voltage level (e.g. x111, x131 for the transformer Medium Voltage (MV) CTs and x211, x231, etc. for tertiary CTs).

   4) Where a scheme includes inputs from different busbars/bus sections, these shall be numbered x111, x131 and x211, x231 for busbar 1 and 2 inputs, etc.

c) The incoming wires for 230 V AC supply circuits shall be numbered H11 (live) and H71 (neutral). Successive wires shall use consecutive numbers. An additional prefix of 1 shall be used for H111 and H171 to denote Earth Leakage Supply.

4.7.4 Direct current key diagrams

a) Incoming Direct Current (DC) supplies shall be numbered J1 and J2 for the Main supply and J3 and J4 for the Main 2/backup supply. Ferrule number suffixes shall change to K, L, M, N or P (as appropriate) after the Miniature Circuit-breaker (MCB).

b) Main tripping lead numbers are to be prefixed with ‘K’, and start with 101 and end with 299. Positive-related leads are numbered with odd numbers, and negative-related leads with even numbers.

   - 101 – 299 – Main tripping lead numbers

c) Leads for the Main 2 or backup tripping circuits are prefixed K and are numbered from 300 to 499 and closing circuits are numbered from 500 to 699. They follow the same pattern as for the Main circuits.

   - 300 – 499 – Main 2 or Backup tripping lead numbers
   - 500 – 699 – Closing circuits

d) Prefixes L, M, N or P shall be used in place of ‘K’ as appropriate.

e) These numbers change to the next odd or even number after passing through a contact, test block or switch.

f) The terminal number does not change after passing through a terminal.

g) A combined alphanumeric numbering system, e.g. KLx, is used at Transmission/Generation interface applications; on the 765 kV Transmission breaker-and-a-half schemes; low impedance bus zone schemes; and secure supply schemes, where x is as per the numbering system above.

h) The ferrules of circuit-breaker fail output wires shall be numbered P7 and P17. For schemes with two circuit-breaker fail outputs (e.g. transformer schemes), these shall use ferrule numbers P7 and P17, and P107 and P117 respectively.

4.8 Numbering of control wires within power plant equipment

4.8.1 Protection and control schemes have, of necessity, to interface with Power Plant equipment, which they control. Reference [1] IEC 62491 describes three different types of numbering systems that can be used at interface terminals of control and power plant equipment. The three systems are:

a) Identification labelling: The labels designate each wire as part of a system. The same label is applicable all along the cable or core, irrespective of junctions along its run.

b) Connection labelling, comprising three options:

1) Local-end Connection labelling: The end of each core is labelled according to the terminal at which it terminates. The ends of each wire have different labels.

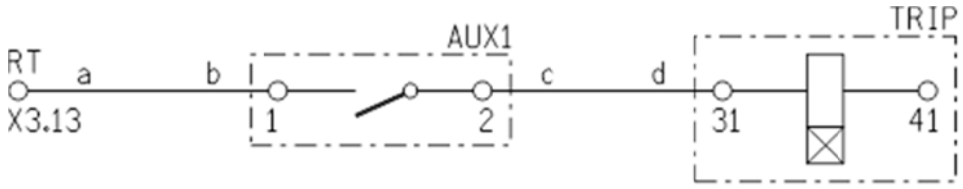
2) Remote-end Connection labelling: The end of each core is labelled according to the terminal at which the remote end terminates. The ends of each wire have different labels.

3) Both-end Connection labelling: Each label is a combination of the local and remote-end connection labelling techniques. The label may be many characters long.

c) Signal labelling: Identifies the signals carried on each core, mainly used in the context of AC supplies: L1, L2, L2, PEN, etc.

4.8.2 Eskom has traditionally used a wire numbering system where numbering of lead wires represents a combination of identification and signal labelling. For example, wire number K101 is identified as a positive DC wire in a protection tripping or closing circuit.

4.8.3 As an example, Figure 2 illustrates the different wire numbering systems:



Numbering system	a	b	c	d
BSS 158	K117	K117	K119	K119
Local-end Connection	X3.13	AUX1:1	AUX1:2	TRIP:31
Remote-end Connection	AUX1:1	X3.13	TRIP:31	AUX1:2
Both-end Connection	X3.13AUX1.1	X3.13AUX1.1	AUX1.2TRIP31	TRIP31AUX1.2

Figure 2: Example of wire numbering

4.8.4 In complex circuits (e.g. tap change drives), the Connection labelling has the advantage that wire numbers need not be assigned. Remote-end connection labelling is the preferred system and has the advantage that, in the event that wiring diagrams have been lost, a wiring diagram can be recreated by tracing wires.

4.8.5 Wire numbering principles

4.8.5.1 The following standard is proposed for the numbering of lead wires in power plant assets:

a) All wires used in power plant equipment shall be labelled.

b) In addition to the label provided in fulfilment of 4.8.5.1a), all wires terminating at Eskom-specified interface terminals shall carry numbers designated by Eskom in accordance with the BSS 158 wire numbering system.

c) The following standard shall be used when assigning wire numbers at the interface:

1) CTs (where provided internal to the equipment): ‘A’ or ‘D’. Power transformers will use the CT secondary terminal number as the wire number. For example, 1AS1 will be used as the wire number to the High Voltage (HV) red phase bushing CT.

2) Status contacts: ‘U’ – spare cores.

3) Indications/Alarms: ‘L’.

4) Tripping or closing functions: ‘K’.

5) DC power supply (e.g. gas monitoring supply): ‘J’.

6) AC Supplies: ‘H’.

4.8.5.2 The convention of odd numbers for positive supply and even numbers for negative supply shall be respected. Specifically, the wire number across a contact will advance by two (U1 becomes U3 and not U2).

4.8.5.3 Isolators: Status contacts shall continue to use the custom numbering system designated by the respective contact types: 1G – 1GA, etc. Other circuits shall use numbering the current convention used in Eskom.

4.9 Wiring terminations

4.9.1 The stripping of insulation shall be carried out such that no damage to conductors occurs. Any nicked wiring will be rejected. The stripping tools used shall be of the type which permits the length of strip to be preset.

4.9.2 All wires < 6 mm² in the panel shall be terminated with pre-insulated crimped connectors of approved types. All terminations shall be made with the tool recommended by the manufacturer of the lugs. Crimping tools shall be of the type which will not release the termination during normal operation until the crimp has been correctly formed. A double die crimping tool shall be used in order to effect both the lug and insulation support crimp simultaneously.

4.9.3 All wires and cables > 6 mm² shall be terminated with an approved lug. The lug shall be crimped with a hydraulically actuated hexagonal die tool as recommended by the manufacturer of the lug.

4.9.4 The lug size, current and voltage rating shall match the wire and cable used. All wiring terminations should be done such that the ferrules are fully visible and legible at each junction. No ferrules should be inside the trunking.

4.9.5 There shall be no bare wire exposed between a lug and the insulation of the wire to which it is crimped. All tools used shall be regularly inspected and tested with approved gauges, and maintained or repaired as necessary. Tools shall be inspected and tested initially at weekly intervals, but this period may be extended in the light of experience. A log of inspections shall be maintained for Eskom’s inspection.

4.9.6 The lugs selected shall be the correct barrel size for the size of wire or cable with which they are to be used. The dimensions of the tongue shall match the stud, screw or aperture of the terminal to which they will be connected.

4.9.7 A sample of each type of lug, wire, tool and finished connection, if not previously approved, shall be submitted to Eskom for approval before commencing with wiring.

4.9.8 Sample crimped ends, selected at random, may be subjected to tests in situ, to prove their mechanical strength. Such tests will consist of an axial pull, equivalent to approximately 60% of the nominal breaking load of the conductor only, applied by means of a spring balance or similar device. For the purpose of this standard, the force to be applied when testing crimped terminations on 1,5 mm² and 2,5 mm² cables shall be approximately 270 N. For 0,75 mm², the force shall be approximately 150 N.

4.10 Wiring supports

a) Wiring and cabling shall be routed such that its insulation is not subject to injurious temperatures or stresses.

b) Grommets or bushes shall be used where wires or cables pass through metalwork.

c) Wiring and cabling shall be adequately supported and clamped. The resulting deformation shall not cause the insulation properties to be outside specified performance limits.

d) Where wiring is routed from the inside of a panel to a panel door, its wiring shall be routed through a protective wiring sock.

e) Joints or splices in any wiring are not acceptable.

f) Any support for wiring shall be of non-conductive material.

g) All panel and equipment terminals shall be completely accessible after the wiring and cabling have been completed.

h) Each wiring tail shall be of sufficient length to reach its allocated terminal on the item of equipment, plus an additional length of 10 mm to facilitate wiring changes.

i) For the safety of personnel working on equipment, cable ties shall be cut using an approved cable tie gun, which ensures that no sharp ends are produced.

4.11 Cable numbers

Unless informed otherwise by Eskom:

a) Cables shall be numbered in ranges appropriate to their applicable voltage level and/or function as per Table 2, Table 3 and Table 4.

b) Each cable number shall be prefixed by a letter identifying the panel to which it is associated (e.g. Transformer 1 = A, Transformer 2 = B). The same number shall be used at both ends of the cable.

c) Wherever possible, cable numbering shall be kept consistent between bays (e.g. x301 is the cable between the Red phase CT and the CT Junction Box on all 132 kV bays). The same number shall be used at both termination points or ends of the cable

Table 2: Standardized cable number series per voltage level and function

Voltage level or function	Cable number series	Cable number prefix
765 kV	8 000 to 8 065	#
400 kV	100 to 165	#
275 kV and 220 kV	200 to 265	#
132 kV	300 to 365	#
88 kV, 66 kV and 44 kV	400 to 465	#
33 kV, 22 kV and 11 kV	500 to 565	#

Voltage level or function	Cable number series	Cable number prefix
(Bulk) auxiliary power supplies	600 to 690	#
AC/DC supplies	700 to 790	#
Intermediate Distribution Frame (IDF) Cabling Teleprotection	800 to 999	#
Measurements IDF Cabling	1 000 to 1 099	#

NOTE: # The buszone suffix allocated to a bay is used as the cable prefix. Example: Cable number A.100 would refer to a cable used in a 400kV feeder bay with the allocated buszone suffix of A. The suffix can be obtained from the station electric diagram.

Table 3: Cable number for looped supplies

Looped supplies	Cable number	Cable number prefix
U_{AC} 230 V E/L supply	93	*$
Trfr Mast/Follower	94	*$
Spring rewind supply	95	*$
U_{AC} 230 V supply	96	*$
VT phasing & sync	98 and 98	*$
Transfer buswires	99	*$

NOTE: *$ The buszone suffix of the source panel followed by the buszone suffix of the destination panel. Add the voltage level prefix and then the appropriate looped supply cable number. Example: Cable number A.B.195; A Bay with allocated suffix A; B Bay with allocated suffix B; 1 400 kV Bay; 95 Spring rewind supply.

Table 4: Cable number for voltage level

Voltage level (kV)	Cable number prefix
765	80
400	1
275 and 220	2
132	3
88, 66 and 44	4
33, 22 and 11	5

4.12 Marking, labelling and packaging

Not applicable.

4.13 Spares

Not applicable.

5. Tests

Not applicable.

Annex A – Impact assessment

(Normative – for Eskom internal use only)

A.1 Guidelines

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

A.2 Critical points

A.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, optimized costs.

Comment: Compilation of this document has been necessitated by the PTM&C's adoption of Future Technology and Strategy and Roadmap.

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

Comment: n/a

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

Comment: n/a

A.2.4 When will new stock be available?

Comment: Protection and Control scheme national contracts are being established.

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

Comment: n/a

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: Associated functional specification documents must also be done.

A.2.7 Provide details of any comments made by the Regions regarding the implementation of this document.

Comment: (n/a during commenting phase).

A.3 Implementation time frame

A.3.1 Time period for implementation of requirements.

Comment: n/a

A.3.2 Deadline for changeover to new item and personnel to be informed of DX wide changeover.

Comment: n/a

A.4 Buyer's guide and power office

A.4.1 Does the Buyer's Guide or Buyer's List need updating?

Comment: Not yet.

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

Comment: n/a

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

Comment: n/a

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

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

Comment: n/a

A.5 CAP/LAP pre-qualification process-related impacts

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

Comment: Yes. This will be done via a Request for Information (RFI).

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

Comment: n/a

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

Comment: Yes.

A.5.4 Is implementation of the provisions of this document required during the current supplier qualification period?

Comment: Yes.

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

Comment: An inquiry will be issued in due course.

A.5.6 If Yes to A.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: Yes. This is in addition to the RFI to be sent via Commercial.

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

Comment: Yes.

A.5.8 Material group(s) affected by specification (refer to Pre-qualification invitation schedule for list of material groups).

Comment: Protection and control schemes

A.6 Training or communication

A.6.1 Is training required?

Comment: No.

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

Comment: Document awareness training.

A.6.3 State designations of personnel that will require training.

Comment: n/a

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

Comment: n/a

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).

Comment: n/a

A.6.6 Was Technical Training Section consulted regarding module development process?

Comment: n/a

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

Comment: SCOT Study Committees.

A.7 Special tools, equipment, software

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

Comment: n/a

A.7.2 Are stock numbers available for the new equipment?

Comment: n/a

A.7.3 What will be the cost of these special tools, equipment, software?

Comment: n/a

A.8 Finances

A.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:

Impact assessment completed by:

Name: Haggai Sithole

Designation: Senior Engineer – Protection (PTM&C)