# PROJECT SPECIFICATION FOR PRIMARY DISTRIBUTION MV SWITCHGEAR AND ACCESSORIES

- **SITE CONDITIONS:**

  - **Altitude:** 1 738 meters above sea level.

  - **Temperature:**

  Max: 35°C
  Min: -6°C

  - **Humidity:**

  During the night: 100 % relative humidity
  During the day: 25 % relative humidity

  - **Lightning:**

  Severe lightning storms prevail.

  - **DELIVERY:**

  The specific delivery times must accompany the tender document.

## 1. SCOPE

This specification covers the minimum requirements for the manufacture, testing and supply of withdrawable primary distribution switchgear, suitable for use indoors. The specification covers switchgear to be used for “new works” as well as switchgear required for “extension or maintenance” of existing switchgear in the Mogale City network. In all cases the switchgear supplied shall be new in all respects.

Switchgear for “new works” shall comply with the requirements of SANS 1885 / NRS 003 as well as this specification. The following switchgear shall be required for “new works”:

ITEM 1 – BKR PANEL 11kV 800A 25kA INC 1250A SB/BAR
ITEM 2 – BKR PANEL 11kV 1250A 25kA INC 1250A SB/BAR
ITEM 3 – BKR PANEL 11kV 1250A 25kA B/SECT 1250A SB/BAR
ITEM 4 – BKR PANEL 11kV 800A 25kA FDR 1250A SB/BAR
ITEM 5 – BKR PANEL 11kV 800A 25kA FDR A/R 1250A SB/BAR
ITEM 6 – BKR PANEL 11kV 800A 25kA FDR MAG ACT 1250A SB/BAR
ITEM 7 – VT PANEL 11kV/110V 200VA CL 1 1250A SB/BAR
ITEM 8 – VT PANEL 6.6kV/110V 200VA CL 1 1250 A SB/BAR

ITEM 9 – BKR PANEL 11kV 2500A 25kA INC 2500A SB/BAR
ITEM 10 – BKR PANEL 11kV 2500A 25kA B/SECT 2500A SB/BAR
ITEM 11 – BKR PANEL 11kV 1250A 25kA FDR 2500A SB/BAR
ITEM 12 – BKR PANEL 11kV 800A 25kA FDR 2500A SB/BAR
ITEM 13 – BKR PANEL 11kV 800A 25kA FDR A/R 2500A SB/BAR
ITEM 14 – VT PANEL 11kV/110V 200VA CL 1 2500A SB/BAR
ITEM 15 – VT PANEL 6.6kV/110V 200VA CL 1 2500A SB/BAR

ITEM 16 – BKR PANEL 11kV 2500A 25kA INC 2500A DB/BAR
ITEM 17 – BKR PANEL 11kV 2500A 25kA B/SECT 2500A DB/BAR
ITEM 18 – BKR PANEL 11kV 2500A 25kA B/COUPLER 2500A DB/BAR
ITEM 19 – BKR PANEL 11kV 1250A 25kA FDR 2500A DB/BAR
ITEM 20 – BKR PANEL 11kV 800A 25kA FDR 2500A DB/BAR
ITEM 21 – BKR PANEL 11kV 800A 25kA FDR A/R 2500A DB/BAR
ITEM 22 – VT PANEL 11kV/110V 200VA CL 1 2500A DB/BAR
ITEM 23 – VT PANEL 6.6kV/110V 200VA CL 1 2500A DB/BAR

NOTE – SB/BAR = single busbar, DB/BAR = double busbar, INC = incomer, B/SECT = bus-section, B/COUPLER = bus-coupler, FDR = feeder, A/R = auto reclose, CL = class.

Switchgear for “extension or maintenance” shall where possible comply with the requirements of SANS 1885 / NRS 003 as well as this specification. The “extension or maintenance” ITEMS shall as a minimum comply with the requirements of IEC 60056 and IEC 60298. Since the Mogale City network has a substantial amount of legacy switchgear installed the following shall be required for “extension or maintenance”:

ITEM 24 – JOGGLE PANEL to accommodate 11kV 800A 20 kA Equivalent to “T1” Type STD B/BAR TO ITEM 1 to 8
ITEM 25 – JOGGLE PANEL to accommodate 11kV 800A Equivalent to “T1” Type SHORT B/BAR & BAND JOINT TO ITEM 1 to 8
ITEM 26 – JOGGLE PANEL to accommodate 11kV 1250A 25kA Equivalent to “AG” Type PANEL (VERTICAL B/BAR) TO ITEM 1 to 8
ITEM 27 – JOGGLE PANEL to accommodate 11kV 1250A 25kA Equivalent to “AG” Type PANEL (DELTA B/BAR) TO ITEM 1 to 8

ITEM 28 – JOGGLE PANEL to accommodate 11kV 2000A 25kA Equivalent to "SBV" Type (BACK & FRONT) DB/BAR TO ITEM 15 to 21

In addition to the switchgear required for maintenance the following protection relays are required for maintenance purposes:

ITEM 29 – Protection Relay equivalent or similar to MICOM P121 type relay
ITEM 30 – Protection Relay equivalent or similar to MICOM P123 type relay

Additional Items required

ITEM 31 – TOOLS FOR 800 A PANELS
ITEM 32 – TOOLS FOR 1250 A PANELS
ITEM 33 – TOOLS FOR 2500 A PANELS
ITEM 34 – STAND OFF REMOTE SWITCHING CONTROL CABLE (20M cord)
ITEM 35 – BUSBARS 800 A (1 SET)
ITEM 36 – BUSBARS 1250 A (1 SET)
ITEM 37 – BUSBARS 2500 A (1 SET)

****NB! All new orders must include one set of switching tools additional sets can be ordered separately.****

## 2. NORMATIVE REFERENCES

SANS 1885 / NRS 003:2008, AC Metal enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 36 kV.

SANS 62271-100, High-voltage switchgear and controlgear – Part 100: High-voltage alternating current circuit-breakers.

SANS 62271-200:2004, High-voltage switchgear and controlgear – Part 200: A.C. metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV.

## 3. DEFINITIONS AND ABBREVIATIONS

For the purposes of this specification the definitions given in SANS 1885 / NRS 003 shall apply.

## 4. ADDITIONAL REQUIREMENTS IN TERMS OF SANS 1885 / NRS 003

### 4.1 Rated normal current

The rated normal current of the circuit breakers and panels are as follows:

| ITEM | Rated normal current of circuit breaker (A) | Rated normal current of busbar (A) |
|---|---|---|
| 1 | 800 | 1250 |
| 2 | 1250 | 1250 |
| 3 | 1250 | 1250 |
| 4 | 800 | 1250 |
| 5 | 800 | 1250 |
| 6 | 1250 | 1250 |
| 7 | N/A | 1250 |
| 8 | N/A | 1250 |
| | | |
| 9 | 2500 | 2500 |
| 10 | 2500 | 2500 |
| 11 | 1250 | 2500 |
| 12 | 800 | 2500 |
| 13 | 800 | 2500 |
| 14 | N/A | 2500 |
| 15 | N/A | 2500 |
| | | |
| 16 | 2500 | 2500 |
| 17 | 2500 | 2500 |
| 18 | 2500 | 2500 |
| 19 | 1250 | 2500 |
| 20 | 800 | 2500 |
| 21 | 800 | 2500 |
| 22 | N/A | 2500 |
| 23 | N/A | 2500 |

The rated normal current of all panels shall be achieved without the need for forced ventilation/cooling.

## 4.2 Rated insulation level

The rated insulation level of the switchgear shall be 12 kV with a basic insulation level of 95 kV.

## 4.3 Power cable termination compartment

The cable termination compartment shall be in accordance with the requirements of NRS 012, with the following specific requirements:

- 800A panels shall be suitable for the termination of a 3-core 185 $mm^2$ PILC cable using a conventional 3-core indoor termination in accordance with NRS 053. A distance of 800 mm shall be provided from the cable support clamp to the point of lug attachment.
- 1250 A panels shall be suitable for the termination of 2 x 1-core 630 $mm^2$ PILC cables per phase using conventional 1-core indoor terminations in accordance with NRS 053.
- 2500 A panels shall be suitable for the termination of 4 x 1-core 630 $mm^2$ PILC cables per phase using conventional 1-core indoor terminations in accordance with NRS 053.
- Provision shall be made for each cable to be attached to a separate point i.e. no back to back lugs will be accepted.
- Earthing bar/s shall be located in such a way that connection of the cable termination/s earthing braid/s shall be possible using standard NRS 053 type terminations.
- Vermin proofing plates on 1250 A and 2500 A panels shall be non-magnetic metal.

## 4.4 Racking operation for circuit breakers and voltage transformers

**4.4.1** Racking of circuit breakers and voltage transformers from the isolated position to the service position shall be horizontal.

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****Removal of circuit breakers and voltage transformers from the panel shall be possible without the need for a transporting device i.e. the circuit breaker and VT shall have an integral transporting device.****

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## 4.5 Auxiliary circuit function designations

All auxiliary circuits shall be labelled using the “Weidmuller” pre-printed labelling system.

### 4.6 Protection and control

Protection and control devices shall be “onboard”.

### 4.7 Earthing

**4.7.1** Busbar earthing shall be integral to the busbar voltage transformer panels.

**1.7.2** Cable earthing shall be integral to the circuit breaker.

### 4.8 MV cable accessories

ITEM 1 to 6, 9 to 13 and 16 to 20 shall be supplied with heat shrink straight shroud kits that will be used to shroud the lug to switchgear connection point as shown in figure 1. The shroud kits shall be supplied with suitable filler mastics used to smooth the profile under the heatshrink shroud. The number of shroud kits to be supplied per panel shall be according to the number of cables as specified in clause 4.3 of this specification.

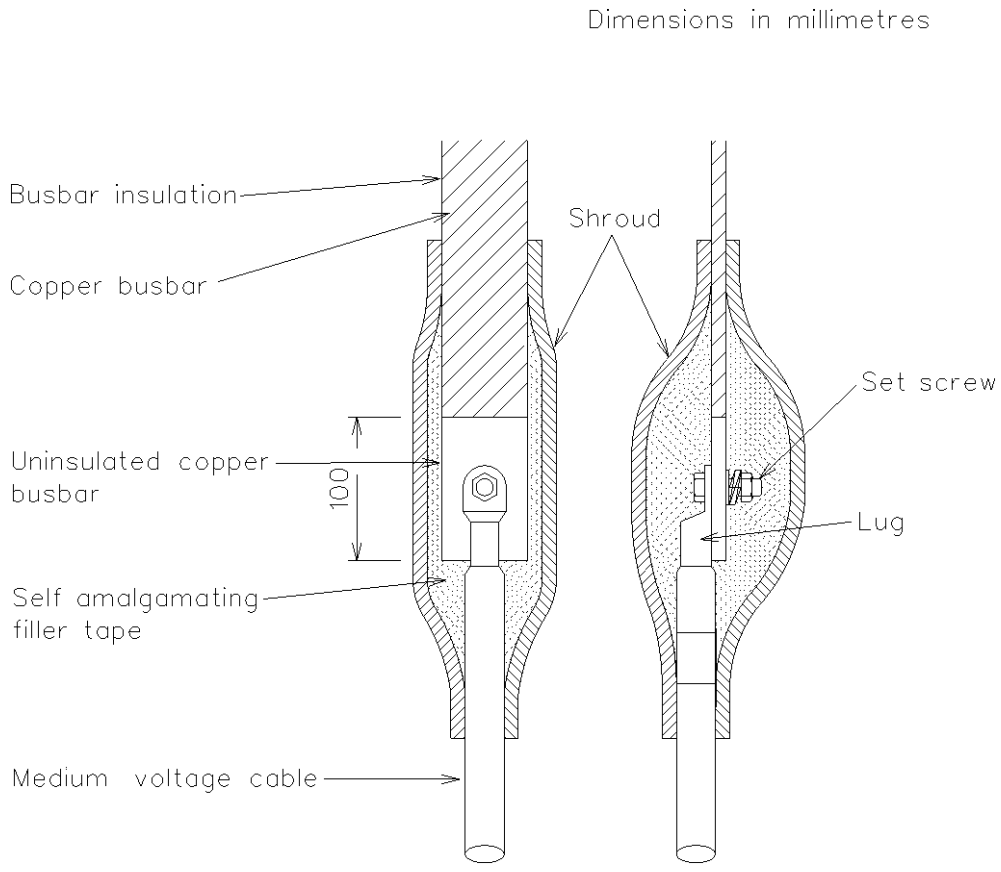


Figure 1 : Shrouded termination for cable to switchgear attachment

## 4.9 Stand-off remote control unit for remote switching of circuit-breakers

4.9.1 Each switchboard shall be supplied with a hand-held stand-off remote control unit (also referred to as an umbilical cord / pendant control) which shall be used for remote switching (i.e. trip/close) of all circuit breakers.

4.9.2 The minimum length of the lead shall be 20 m. If a longer length is required, it shall be specified in schedule A.

4.9.3 NOTE For larger substation switch rooms, a longer length may be required in order to ensure that all circuit-breakers can be switched from outside the switch room door.

4.9.4 The control box of the hand-held remote control unit shall be fitted with two control push-buttons as follows:

4.9.5 Green push-button with the “I” symbol – for closing the circuit-breaker

4.9.6 Red push-button with the “O” symbol – for tripping the circuit-breaker

4.9.7 The control box of the hand-held remote control unit shall have a minimum degree of protection of IP67 in accordance with SANS IEC 60529.

4.9.8 The female receptacle for the plug-in connector shall be located on the front LV compartment door.

4.9.9 The stand-off remote control unit shall have a self-retaining plug-in connector and matching female receptacle in accordance with the make and type specified in schedule A. The wiring of the pins shall be as specified in schedule A.

4.9.10 The female receptacle shall be wired directly to the terminals provided for in the LV compartment in accordance with DST 34-1996 and D-DT-5408.

4.9.11 The circuit-breaker mechanical CLOSE button on the circuit-breaker compartment door shall be disabled to prevent an operator from closing the circuit-breaker while standing in front of the panel. It shall only be possible to close the circuit-breaker from the protection and control scheme or the stand-off remote control unit.

# ***ELECTRICITY DISTRIBUTION SERVICES***

## ***MOGALE CITY***

## ***SWITCHGEAR SCHEDULES A & B***

**Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)**
**Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer) (xxxxxxxx N/A)**

| Item | Clause (SANS 1885) | Description | | Schedule A | Schedule B |
|---|---|---|---|---|---|
| **1** | 4.1.1.1 | Rated voltage | kV | 12 | _____ |
| | 4.1.1.4.2 | Is 75 kV impulse required for 12 kV switchgear? | | No | _____ |
| | 4.1.1.5.2 | Rated short time withstand current for 12 kV switchgear | kA | 25 | _____ |
| | 4.1.2 | Auxiliary supply voltage if other than d.c 110 V? | V | 110 D.C. | _____ |
| **2** | 4.2.3.1 | Is $SF_6$ used for insulation? | | No – AIS | N/A |
| | | If yes, in which compartments? | | xxxxxxxxx | N/A |
| | 4.2.3.4 | Is a device for monitoring the $SF_6$ pressure required? | | No | _____ |
| | 4.2.3.6 | Quantity of $SF_6$ to be used in each separately filled compartment? | | xxxxxxxxx | N/A |
| | 4.2.4.4 | Clearance hole or stud size of earthing bar offered | | M12 | _____ |
| | 4.2.7 | Creepage distance | | 20 mm/kV | _____ |
| | 4.2.9.2 | State special coating requirements | | None | _____ |
| | 4.2.9.3 | State other colours required | | None | _____ |
| | 4.2.10.1 | Is an integral cable test facility required? | | No | _____ |
| | 4.2.10.3 | Type of test facility offered? | | xxxxxxxxx | N/A |
| | 4.2.10.5 | Switch disconnector to incorporate integral type circuit test facility | | N/A | |
| | 4.2.10.6 | Description of test plugs | | xxxxxxxxx | N/A |
| **3** | 4.3.1.1.4 | Circuit-breaker interrupting medium | | xxxxxxxxx | _____ |
| | 4.3.1.5.1 | Are earthing facilities required for all main circuits? | | Yes | _____ |
| | 4.3.1.5.2 | For circuit earthing, are facilities either integral to the panel or circuit breaker? | | xxxxxxxxx | _____ |
| | 4.3.1.5.3 | For busbar earthing, are facilities either integral to the switchboard or by means of a busbar earth switch | | xxxxxxxxx | _____ |
| | 4.3.1.7.3 c) | Electrical charging required? | | Yes | _____ |
| | 4.3.1.8.2 | Motorised racking devices to be provided? | | No | _____ |
| | 4.3.1.9.1 | Specify type of closing operating mechanism fitted with each circuit breaker | | Electrical charging & operation | _____ |
| | 4.3.1.9.5 | Second opening release required? | | No | N/A |

# ***SWITCHGEAR SCHEDULES A & B (cont.)***

**Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)**
**Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer) (xxxxxxxx N/A)**

| Item | Clause (SANS 1885) | Description | Schedule A | Schedule B |
|---|---|---|---|---|
| | 4.3.1.10.3 | Number of spare contacts required for: | | |
| | | a) $SF_6$ alarm | N/A | _____ |
| | | b) lock-out $SF_6$ | N/A | _____ |
| | | c) circuit-breaker auxiliary 'a' | 2 | _____ |
| | | d) circuit-breaker auxiliary 'b' | 2 | _____ |
| | | e) spring limit | 1 | _____ |
| | | f) circuit-breaker earthed | 1 | _____ |
| | 4.3.1.10.4 | Number of spare contacts offered for: | | _____ |
| | | a) $SF_6$ alarm | xxxxxxxxx | _____ |
| | | b) lock-out $SF_6$ | xxxxxxxxx | _____ |
| | | c) circuit-breaker auxiliary 'a' | xxxxxxxxx | _____ |
| | | d) circuit-breaker auxiliary 'b' | xxxxxxxxx | _____ |
| | | e) spring limit | xxxxxxxxx | _____ |
| | | f) circuit-breaker earthed | xxxxxxxxx | _____ |
| | 4.3.1.10.6 | Should the circuit-breaker auxiliary contacts be wired to the compartment behind the relay chamber doors? | Yes | _____ |
| | 4.3.2.3.2 | Type of earthing switch offered | xxxxxxxxx | _____ |
| | 4.3.2.6.2 | Type of circuit-breaker transporting device | None | N/A |
| | 4.3.3.1.2 | Circuit-breaker details: | | |
| | | a) interrupting medium | Vacuum | _____ |
| | | b) manufacturer | xxxxxxxxx | _____ |
| | | c) country of origin | xxxxxxxxx | _____ |
| | | d) model/type designation | xxxxxxxxx | _____ |
| | | e) total mass kg | xxxxxxxxx | _____ |
| | | f) rating nameplate position | xxxxxxxxx | _____ |
| | 4.3.3.1.3 | Number of in-line disconnectors? | N/A | N/A |
| | 4.3.3.1.4 | Are two or three position disconnectors offered? | N/A | N/A |
| **4** | 4.4.1.5 | Type of switch disconnector offered | N/A | N/A |
| **5** | 4.5.1.1.3 | Current sensor details required: | N/A | N/A |
| | | a) number of current sensors; | N/A | N/A |
| | | b) rated primary current; | N/A | N/A |
| | | c) class | N/A | N/A |
| | | d) accuracy. | N/A | N/A |
| | 4.5.1.1.4 | Current sensor details offered: | | |
| | | a) type offered | N/A | N/A |
| | | b) encapsulation material | N/A | N/A |
| | | c) rated primary current | N/A | N/A |

**Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)**
**Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer) (xxxxxxxx N/A)**

| Item | Clause (SANS 1885) | Description | | Schedule A | Schedule B |
|---|---|---|---|---|---|
| | | d) class | VA | N/A | N/A |
| | | e) accuracy | | N/A | N/A |
| | | f) output voltage of current sensor | | N/A | N/A |
| | 4.5.1.2.2 | Number of current transformers required for: | | | |
| | | a) overcurrent (O/C) and earth fault (E/F) protection | | 3 on all ITEMS except B/SECT's & B/COUPLER | _____ |
| | | b) differential protection | | None | _____ |
| | | c) metering | | 3 on all FDRS only | _____ |
| | 4.5.1.2.3 | Requirements for current transformers for O/C & E/F application (FDRS only): | | | |
| | | a) class | | 10P10 | _____ |
| | | b) burden | VA | 15 | _____ |
| | | c) tap ratios | | 400/200/100/5 | _____ |
| | | d) knee-point voltage | V | N/A | _____ |
| | | e) secondary resistance | Ω | N/A | _____ |
| | | f) excitation current at knee-point voltage | mA | N/A | _____ |
| | | Requirements for current transformers for O/C & E/F application (ITEM 2): | | | |
| | | a) class | | 10P10 | _____ |
| | | b) burden | VA | 15 | _____ |
| | | c) tap ratios | | 1200/800/200/5 | _____ |
| | | d) knee-point voltage | V | N/A | _____ |
| | | e) secondary resistance | Ω | N/A | _____ |
| | | f) excitation current at knee-point voltage | mA | N/A | _____ |
| | | Requirements for current transformers for O/C & E/F application (ITEM 9): | | | |
| | | a) class | | 10P10 | _____ |
| | | b) burden | VA | 15 | _____ |
| | | c) tap ratios | | 2400/1600/1000/400/5 | _____ |
| | | d) knee-point voltage | V | N/A | _____ |
| | | e) secondary resistance | Ω | N/A | _____ |
| | | f) excitation current at knee-point voltage | mA | N/A | _____ |
| | 4.5.1.2.3 | Requirements for current transformers for metering application (FDRS only): | | | |
| | | a) class | | 1 | _____ |
| | | b) burden | VA | 10 | _____ |
| | | c) tap ratios | | 400/200/100/5 | _____ |

| | | | | | |
|---|---|---|---|---|---|
| | | d) knee-point voltage | V | N/A | _____ |
| | | e) secondary resistance | Ω | N/A | _____ |
| | | f) excitation current at knee-point voltage | mA | N/A | _____ |
| | | Requirements for current transformers for metering application (ITEM 2): | | | |
| | | a) class | | 1 | _____ |
| | | b) burden | VA | 10 | _____ |
| | | c) tap ratios | | 1200/800/200/5 | _____ |
| | | d) knee-point voltage | V | N/A | _____ |
| | | e) secondary resistance | Ω | N/A | _____ |
| | | f) excitation current at knee-point voltage | mA | N/A | _____ |
| | | Requirements for current transformers for metering application (ITEM 9): | | | |
| | | a) class | | 1 | _____ |
| | | b) burden | VA | 10 | _____ |
| | | c) tap ratios | | 2400/1600/400/5 | _____ |
| | | d) knee-point voltage | V | N/A | _____ |
| | | e) secondary resistance | Ω | N/A | _____ |
| | | f) excitation current at knee-point voltage | mA | N/A | _____ |
| | 4.5.1.2.4 | State, for O/C & E/F, the following on the current transformers offered: | | | |
| | | a) type offered | | xxxxxxxxx | _____ |
| | | b) encapsulation material | | xxxxxxxxx | _____ |
| | | c) class | | xxxxxxxxx | _____ |
| | | d) burden | VA | xxxxxxxxx | _____ |
| | | e) tap ratios | | xxxxxxxxx | _____ |
| | | f) knee-point voltage | V | xxxxxxxxx | N/A |
| | | g) secondary resistance | Ω | xxxxxxxxx | N/A |
| | | h) excitation current at knee-point voltage | mA | xxxxxxxxx | N/A |
| | 4.5.1.2.4 | State, for metering, the following on the current transformers offered: | | | |
| | | a) type offered | | xxxxxxxxx | _____ |
| | | b) encapsulation material | | xxxxxxxxx | _____ |
| | | c) class | | xxxxxxxxx | _____ |
| | | d) burden | VA | xxxxxxxxx | _____ |
| | | e) tap ratios | | xxxxxxxxx | _____ |

# ***SWITCHGEAR SCHEDULES A & B (cont.)***

**Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)**
**Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer) (xxxxxxxx N/A)**

| Item | Clause (SANS 1885) | Description | | Schedule A | Schedule B |
|---|---|---|---|---|---|
| | | f) knee-point voltage | V | xxxxxxxxx | N/A |
| | | g) secondary resistance | Ω | xxxxxxxxx | N/A |
| | | h) excitation current at knee-point voltage | mA | xxxxxxxxx | N/A |
| | 4.5.1.2.9 | Short time current rating cannot be achieved | | xxxxxxxxx | Yes/no |
| | 4.5.1.2.11 | Is permission required for metering current transformers to be used for other instruments? | | Xxxxxxxxx | Yes/No |
| | 4.5.2.1 | Are heaters to be installed in the switchgear? | | Xxxxxxxxx | Yes/No |
| | 4.5.2.2 | Type of heater offered | | xxxxxxxxx | _____ |
| | 4.5.3.1 | Are surge arresters to be installed in feeder panels? | | No | _____ |
| | 4.5.3.2 | If yes, state type and position of arrester | | N/A | _____ |
| | 4.5.4.1.2 | Details of the voltage sensor including make, type, dielectric and ratings | | N/A | _____ |
| | 4.5.4.2.3 | Voltage transformer information requirements: | | | |
| | | a) type (fixed or disconnectable/withdrawable); | | Withdrawable | _____ |
| | | b) one-phase or three-phase; | | 3-phase | _____ |
| | | c) fused or un-fused on the primary side | | Fused | _____ |
| | | d) ratio; | | 11000/110 ITEMS 7, 14 & 21<br>6600/110 ITEMS 8, 15 & 22 | _____ |
| | | e) class; | | 1 | _____ |
| | | f) burden (200 VA); | | 200VA | _____ |
| | | g) voltage factor; | | 1.9 | _____ |
| | | h) primary connection at busbar or circuit side. | | Busbar | _____ |
| | 4.5.4.2.4 | Information on voltage transformers offered: | | | |
| | | a) name of manufacturer | | xxxxxxxxx | _____ |
| | | b) withdrawable or non-withdrawable | | xxxxxxxxx | _____ |
| | | c) ratios | | xxxxxxxxx | _____ |
| | | d) class | | xxxxxxxxx | _____ |
| | | e) burden | VA | xxxxxxxxx | _____ |
| | | f) voltage factor | | xxxxxxxxx | _____ |
| | | g) location of fuses | | xxxxxxxxx | _____ |
| | | h) location of test block | | xxxxxxxxx | _____ |
| | | i) primary connection at busbar or circuit side | | xxxxxxxxx | _____ |

# ***SWITCHGEAR SCHEDULES A & B (cont.)***

**Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)**
**Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer) (xxxxxxxx N/A)**

| Item | Clause (SANS 1885) | Description | | Schedule A | Schedule B |
|---|---|---|---|---|---|
| | 4.5.4.2.6 | Secondary earth of the VT | | Earthed | _____ |
| | 4.5.5.2 | Requirements for protection equipment on all INC, FDR | | MICOM P121 | _____ |
| | 4.5.5.2 | Requirements for protection equipment on all FDR with A/R | | MICOM P123 | _____ |
| | 4.5.5.4 | Details of protection equipment offered | | xxxxxxxxx | _____ |
| | | a) manufacturer | | xxxxxxxxx | _____ |
| | | b) type | | xxxxxxxxx | _____ |
| | | c) rating | | xxxxxxxxx | _____ |
| | 4.5.6.1.1 | Details of instruments required | | Local/remote switch, TNC, red & green lamps | _____ |
| | | Details of transducers required | | None | _____ |
| | | Details of metering equipment required | | None | _____ |
| | | Details of instruments offered | | xxxxxxxxx | _____ |
| | | Details of transducers offered | | xxxxxxxxx | _____ |
| | | Details of metering equipment offered | | xxxxxxxxx | _____ |
| | 4.5.6.1.2 | Scale length of indicating instruments if there is preference | mm | None | _____ |
| | 4.5.6.2.4 | Are ammeters with a thermal maximum demand indicator required? | | Yes | _____ |
| | 4.5.6.2.7 | Accuracy of ammeters offered | % | xxxxxxxxx | _____ |
| | 4.5.6.2.8 | Scale plate required on ammeter | | 0 – 400A | _____ |
| | 4.5.6.3.2 | Are voltmeters with a range of 0 % to 120 % required? | | Yes | _____ |
| | 4.5.7.1.2 | Details of indicators offered | | xxxxxxxxx | _____ |
| | 4.5.7.2.1 | Voltage presence indicating system: Cable live indicating devices required? | | None | _____ |
| | 4.5.7.2.2 | Details of bushing and voltage dividers | | xxxxxxxxx | _____ |
| | 4.5.7.3 | Voltage detection system: Cable live indicating devices required? | | None | _____ |
| | 4.5.7.4.1 | What signal indicators are required? | | Open/closed/earthed | _____ |
| | | On which panels? | | All | _____ |
| | 4.5.7.4.2 | What trip indications are required? | | White lamp | _____ |
| | | On which panels? | | All | _____ |
| | 4.5.8 | Details of alarm circuits required | | None | _____ |
| | 4.5.9.2.2 | Are there alternative wiring requirements? | | No | _____ |

# ***SWITCHGEAR SCHEDULES A & B (cont.)***

**Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)**
**Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer) (xxxxxxxx N/A)**

| Item | Clause (SANS 1885) | Description | Schedule A | Schedule B |
|---|---|---|---|---|
| | | If yes, state details | N/A | _____ |
| | | Is approval required for any alternative wiring offered? | xxxxxxxxx | Yes/No |
| | 4.5.9.3.1 | D.C. circuit protection | MCCBs | _____ |
| | 4.5.9.4.2 | Where are ammeter selector switches required? | All except B/SECT & VT's | _____ |
| | 4.5.9.4.3 | Details of ammeter selector switches offered | xxxxxxxxx | _____ |
| | 4.5.9.4.5 | Where are voltmeter selector switches required? | All except B/SECT | _____ |
| | 4.5.9.4.6 | Details of voltmeter selector switches offered | xxxxxxxxx | _____ |
| | 4.5.9.6.5 | Where should the external termination box be positioned? | Rear | _____ |
| | 4.5.9.7.1 | If relevant, state alternate termination of auxiliary wiring required | N/A | _____ |
| | 4.5.9.8.1 | Details of terminal blocks offered | xxxxxxxxx | _____ |
| | 4.5.9.9.1 | Markings of current and voltage transformers terminals if other than as specified | None | _____ |
| | 4.5.9.9.4 | State alternative circuit designations required | None | _____ |
| **6** | 4.6.7 | Details of test pack required | All routine test reports and fault lists | _____ |
| | 4.6.9 | Quantities of each type of pack to be supplied | xxxxxxxxx | _____ |
| | 4.6.11 | Mounting of accessories cabinet required? | Yes – tool rack | _____ |
| | 4.6.12 | Is a circuit-breaker maintenance trolley required? | No | _____ |
| **7** | 4.7.1.1 | State method used to attach labels | Xxxxxxxxx | _____ |
| | 4.7.2.4 | State requirements for main circuit designation labels | TBA | _____ |
| | | State details of labels | N/A | _____ |
| **8** | 5.1.3 | Number of South African manufactured overseas products produced and installed in South Africa | xxxxxxxxx | _____ |
| | 5.2.1 | State optional type tests if required | None | _____ |
| **9** | 6.1.3 | LSC category | LSC 2B | _____ |
| **10** | 8.1 | Is installation and on-site operational testing to be carried out by the supplier? | Yes | _____ |
| | 8.4 | Is construction power supply available? | TBA | _____ |
| | | | | _____ |