

23 June 2025

BSC ADDENDUM 2 – Correction of Typo Errors and Re-issue of Section C2.2 and Section 6.2

Background:

A few Typo Errors on Pages: 74, 118, 227 have been observed. Descriptions for various items on Section C2.2, Section 6.1 and Section 6.2 are missing. This occurred during the conversion from Ms Word to pdf when the document was being uploaded onto the website. The schedules with the corrected errors are attached below.

 2025-06-24

Wilson Mbhele YYY-MM-DD

Chief Engineer: HV Projects (Electricity)

 2025-06-24

Mokwape Lekganyane YYY-MM-DD

Senior Manager: HV Projects (Electricity)

Corrected Schedules:

SECTION 2(a): 132/11 kV 30 MVA Type 1, Type 2, Type 3 and Type 4 Power Transformers

LOW IMPEDANCE TRANSFORMERS		Technical Details				
Item	Description	eThekwini Electricity Requirement	132/11 kV 30 MVA Type 1 (ONAN/ONAF) Offered	132/11 kV 30 MVA Type 2 (ONAN) Offered	132/11 kV 30 MVA Type 3 (ONAN/ONAF) Offered	132/11 kV 30 MVA Type 4 (ONAN) Offered
		* Complete with whichever is applicable				
1.0	Transformer General Information					
1.1	Name of manufacturer	---				
1.2	Country of origin	---				
1.3	Do the transformers comply in all respects with the standard specifications quoted in the Technical Specification? (if not, indicate deviations)	Yes	Yes/No*	Yes/No*	Yes/No*	Yes/No*
1.4	Manufacturing Experience					
	a) Number of 132 kV transformers manufactured at the factory in the last twelve (12) months	---	transformer(s)	transformer(s)	transformer(s)	transformer(s)
	b) Factory failure rate in five (5) years where transformers above 15 MVA form the sample group	---	%	%	%	%
1.5	Type of Transformers:					
	Core					
1.6	Core Steel					
	a) Manufacturer of core steel	---				
	c) Type of core steel (conventional grain oriented or high permeability)	Yes	Yes/No*	Yes/No*	Yes/No*	Yes/No*
	b) Grade of core steel	---				
	c) Thickness of core steel	---	mm	mm	mm	mm
1.7	Core dimensions					
	a) Window height	---	mm	mm	mm	mm
	b) Distance between core limb centres	---	mm	mm	mm	mm
	c) Core diameter	---	mm	mm	mm	mm
	d) Filling factor	---				
1.8	Cross sectional areas					
	a) Wound limbs	---	mm ²	mm ²	mm ²	mm ²

SECTION 3 (a): 132/33 kV 50 MVA Power Transformers

Item	Description	Technical Details		
		eThekwini Electricity Requirement	132/33 kV 50 MVA Type 1 & Type 3 (ONAN/ONAF) Offered	132/33 kV 50 MVA Type 2 & Type 4 (ONAN) Offered
1.0	Transformer General Information	* Complete with whichever is applicable		
1.1	Name of manufacturer	---		
1.2	Country of origin	---		
1.3	Do the transformers comply in all respects with the standard specifications quoted in the Technical Specification? (If not, indicate deviations)	Yes	Yes/No*	Yes/No*
1.4	Manufacturing Experience			
	a) Number of 132 kV transformers manufactured at the factory in the last twelve (12) months	---	transformer(s)	transformer(s)
	b) Factory failure rate in five (5) years where transformers above 15 MVA form the sample group	---	%	%
1.5	Type of Transformers:			
	Core			
1.6	Core Steel	Core-form		
	a) Manufacturer of core steel	---		
	b) Type of core steel (conventional grain oriented or high permeability)	Yes	Yes/No*	Yes/No*
	c) Grade of core steel	---		
	d) Thickness of core steel	---	mm	mm
1.7	Core dimensions			
	a) Window height	---	mm	mm
	b) Distance between core limb centres	---	mm	mm
	c) Core diameter	---	mm	mm
	d) Filling factor	---		
1.8	Cross sectional areas			
	a) Wound limbs	---	mm ²	mm ²
	b) Yoke	---	mm ²	mm ²
1.9	Total core mass	---	kg	kg
1.10	The design flux density at nominal voltage for:			

Item	Description
132/11 kV, 30 MVA Type 4 power transformer	High IEC impedance Power Transformer with 30 MVA ONAN rating, separate free standing radiator bank, 16 step tap-changer, 132 kV oil cable boxes and 11 kV plug-in connections (as described in this tender document)
33/11 kV, 25 MVA Type 1 power transformer	Power Transformer with 15/25 MVA ONAN/ONAF rating, tank mounted radiators, 14 step tap-changer, 33 kV RIP air bushings and 11 kV plug-in connections (as described in this tender document)
33/11 kV, 25 MVA Type 2 power transformer	Power Transformer with 25 MVA ONAN rating, separate free standing radiator bank, 14 step tap-changer, 33 kV RIP air bushings and 11 kV plug-in connections (as described in this tender document)
33/11 kV, 15 MVA Type 1 power transformer	Power Transformer with 10/15 MVA ONAN/ONAF rating, tank mounted radiators, 14 step tap-changer, 33 kV RIP air bushings and 11 kV plug-in connections (as described in this tender document)
33/11 kV, 15 MVA Type 2 power transformer	Power Transformer with 15 MVA ONAN rating, separate free standing radiator bank, 14 step tap-changer, 33 kV RIP air bushings and 11 kV plug-in connections (as described in this tender document)
132 kV Oil Cable Box option for 132/33 kV, 50 MVA Type 2 and Type 4 power transformer	Supply of 132 kV Oil Cable Boxes in place of 132 kV RIP air bushings for 132/33 kV, 50 MVA Type 1 and Type 3 power transformers
132 kV Oil Cable Box option for 132/11 kV, 30 MVA Type 2 and Type 4 power transformer	Supply of 132 kV Oil Cable Boxes in place of 132 kV RIP air bushings for 132/11 kV, 30 MVA Type 1 and Type 3 power transformers
Vacuum tap-changer for a 275/132 kV, 315 MVA power transformer	16 step tap-changer with vacuum interrupters
Vacuum tap-changer for 132/33 kV, 50 MVA Type 1, Type 2, Type 3 or Type 4 power transformer	16 step tap-changer with vacuum interrupters
Vacuum tap-changer for 132/11 kV, 30 MVA Type 1, Type 2, Type 3 or Type 4 power transformer	16 step tap-changer with vacuum interrupters
Vacuum tap-changer for 33/11 kV, 25 MVA Type 1 or Type 2 power transformer	14 step tap-changer with vacuum interrupters
Vacuum tap-changer for 33/11 kV, 15 MVA Type 1 or Type 2 power transformer	14 step tap-changer with vacuum interrupters
Neutral Earthing Resistor (NER)	Oil immersed metallic neutral earthing resistor, suitable for 800 A earth fault current limiting on 132/11 kV power transformers Type 1, Type 2, Type 3 and Type 4, including support structure, hold down bolts and copper between main transformer and neutral earthing resistor.
33 kV NEC/NER/Aux Trfr (NECRT) 100 kVA	Oil immersed metallic neutral earthing compensator/ resistor, suitable for 800 A earth fault current limiting on 132/33 kV power transformers, including support structure and hold down bolts. 100 kVA Auxiliary Trfr. 33 kV connection to be cable fed or overhead.
33 kV NEC/NER/Aux Trfr (NECRT) 200 kVA	Oil immersed metallic neutral earthing compensator/ resistor, suitable for 800 A earth fault current limiting on 132/33 kV power transformers, including support structure and hold down bolts. 200 kVA Auxiliary Trfr. 33 kV connection to be overhead fed.
33 kV plug-in option for 132/33 kV, 50 MVA Type 1, Type 2, Type 3 and Type 4 power transformers	Supply of 33 kV plug-in connections (as described in this tender document) for 132/33 kV, 50 MVA Type 1, Type 2, Type 3 and Type 4 power transformers' tank wall mounted (three connections per phase).
33 kV plug-in option for 33/11 kV, 25 MVA Type 1 and 2 power transformers	Supply of 33 kV plug-in connections (as described in this tender document) in place of 33 kV RIP air bushings for 33/11 kV, 25 MVA Type 1 and Type 2 power transformers.
11 kV Air Bushing Option for 33/11 kV, 25 MVA Type 1 and 2 power transformers	Supply of 11 kV Air Bushings in place of 11 kV plug-in connections (as described in this tender document) for 33/11 kV, 25 MVA Type 1 and Type 2 power transformers

6.0 Protection Current Transformers

- a) Provision shall be made for the termination of all CTs, including the HV, HV neutral CTs and LV neutral CTs, in the transformer marshalling kiosk.
- b) All spare CTs (if any) must be shorted in the marshalling kiosk by terminal block bridging links.
- c) The order of the current transformers shall be that 'core 1' is furthest from the winding.
- d) The order of the neutral current transformers shall be that 'core 1' on any neutral CT shall be the core closest to the earth point.

6.1 Protection Current Transformers for a 275/132 kV Power Transformer

TYPE	LOCATION	CORE	PROTECTION FUNCTION	No of CTs	RATIO	CLASS	BURDEN (VA)	MIN V _{KP} ① LOWEST RATIO (V)	MAX I _{MAG} (mA)	R _{MAX} ② HIGHEST RATIO (Ω)
275/132/ (22) kV 315 MVA	275 kV Bushing	1	Restricted E/F Main 1	3	1 600/1	X	-	400	50	6,4
		2	Spare	3	1 600/1	X	-	400	50	6,4
		3	Transformer Differential	3	768/2,89	X	-	200	50	3,1
		4	Spare	3	1 600/1	X	-	400	50	6,4
		5	Restricted E/F Main 2	3	1 600/1	X	-	400	50	6,4
		6A	WT1							
		6B	WT1							
		6C	T.C.O.C Blocking	1	660/1	10P10	15	-	-	-
		HV Neutral	1	Restricted E/F Main 1	1	1 600/1	X	-	400	50
	2		Restricted E/F Main 2	1	1 600/1	X	-	400	50	6,4
	3		Neutral Check/Standby Earth Fault	1	1 600/1	10P20	15	-	-	-
	132 kV Bushing	1	Restricted E/F Main 1	3	1 600/1	X	-	400	50	6,4
		2	Transformer Differential	3	1 600/2,89	X	-	400	50	6,4
		3	Overcurrent & Directional E/F	3	1 600/1	5P20	15	-	-	-
		4	Spare	3	1 600/1	X	-	400	50	6,4
5		Restricted E/F Main 2	3	1 600/1	X	-	400	50	6,4	
6		Quality of supply/ Metering	3	1 600/1	0,2	15	-	-	-	
7A		Circulating current	2	1 600/1 380/1	0,5	15	-	-	-	
7B		Circulating current	2	1 600/1 380/1	0,5	15	-	-	-	
7C		WT1	1							
As required										

6.2 Protection Current Transformers for 132/33 kV, 132/11 kV and 33/11 kV Power Transformers

TYPE	LOCATION	CORE	PROTECTION FUNCTION	No of CTs	RATIO	CLASS	BURDEN (VA)	MIN V _{KE} @ LOWEST RATIO (V)	MAX I _{MAO} (mA)	R _{max} @ HIGHEST RATIO (Ω)
132/33 kV 50 MVA Type 1, Type 2, Type 3 and Type 4	132 kV Bushing	1	<u>Trf</u> Diff	3	800/600/400/1	X	-	300	50	3,2
		2	HV REF	3	800/600/400/1	X	-	300	50	3,2
		3	Overcurrent, E/F	3	1 600/1 200/800/1	5P20	15	-	-	-
		4	HV Cable Differential	3	1 600/1 200/800/1	X	-	600	50	6,4
		5	Spare	3	1 600/1 200/800/400/1	X	-	300	50	6,4
	132 kV Neutral	1	HV REF	1	800/600/400/1	X	-	300	50	3,2
		2	Neutral Check	1	800/600/400/1	X	-	300	50	3,2
	33 kV Bushing	1	Metering	3	1 000/500/5	0,2	5	-	-	-
		2	Overcurrent, E/F	3	1 800/1	X	-	450	50	7,2
		3	Line drop com	2	1 800/900/1	10P10	10	-	-	-
		4	WTI	1	600/2	10P1,5	10	-	-	-
	33 kV Neutral	1	LV REF	1	2 500/2 000/1	X	-	450	50	8,0
		2	Standby E/F	1	800/1	5P10	15	-	-	-
		3	Spare	1	2 500/2 000/1 600/800/1	X	-	450	50	8,0
132/11 kV 30 MVA Type 1, Type 2, Type 3 and Type 4	HV Bushing	1	<u>Trf</u> Diff	3	300/1	X	-	300	50	1,2
		2	HV Bus zone	3	1 600/1 200/800/400/1	X	-	400	50	6,4
		3	HV REF	3	150/1	X	-	150	50	0,3
		4	Overcurrent	3	800/400/1	5P15	10	-	-	-
		5	Cable Diff	3	800/400/1	X	-	400	50	3,2
	HV Neutral	1	HV REF	1	150/1	X	-	150	50	0,3
		2	Neutral Check	1	150/1	5P15	10	-	-	-
	LV Bushing	1	WTI	As required						
		2	Line drop com	2	1 575/5	-	10	-	-	-
	LV Neutral	1	LV REF	1	1 800/5	X	-	300	50	0,88
		2	Standby E/F 1 & 2	1	800/5	5P10	10	-	-	-
		3	Spare	1	800/400/1	X	-	200	50	1,6
33/11 kV	HV Bushing	1	<u>Trf</u> Diff	3	500/1	X	-	150	50	1,0

TYPE	LOCATION	CORE	PROTECTION FUNCTION	No of CTs	RATIO	CLASS	BURDEN (VA)	MIN V _{HP} @ LOWEST RATIO (V)	MAX I _{HP} (mA)	R _{max} @ HIGHEST RATIO (Ω)
25 MVA Type 1 and Type 2		2	Spare	3	800/400/1	X	-	300	100	3,2
		3	HV REF	3	500/1	X	-	150	50	1,0
		4	Cable Diff	3	400/1	X	-	300	100	1,6
		1	WTI	As required						
	LV Bushing	2	Line drop comp	2	1 312/5	-	10	-	-	-
		1	LV REF	1	1 800/5	X	-	300	50	0,8
	LV Neutral	2	Standby E/F 1 & 2	1	800/5	5P15	10	-	-	-
		3	Spare	1	800/400/1	X	-	200	50	1,6
33/11 kV 15 MVA Type 1 and Type 2	HV Bushing	1	Trfr Diff	3	300/1	X	-	200	50	0,6
		2	Spare	3	800/400/1	X	-	300	100	3,2
		3	HV REF	3	300/1	X	-	200	50	0,6
		4	Cable Diff	3	400/1	X	-	300	50	1,6
	LV Bushing	1	WTI	As required						
		2	Line drop comp	2	787/5	-	10	-	-	-
	LV Neutral	1	LV REF	1	1 800/5	X	-	300	50	0,8
		2	Standby E/F 1 & 2	1	800/5	5P15	10	-	-	-
		3	Spare	1	800/400/1	X	-	200	50	1,6