

Site Survey Report

To: Nicholas Kiminda

Station: Elburgon 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Nicholas Kiminda	Cable Trenches	OK, 22 Inches
Survey Date	August 13, 2014		
Station Name & Contact	Elburgon 33/11kV		
Region & Town	Elburgon		
Distance to Site(km)	1 km from Elburgon		
Station Coordinates			
Access Road	Off Nakuru Elbergon Rd		

1x7.5MVA TX

2. Drawings

Station drawings to be collected from Protection team, Nakuru

3. Equipment Room

Location	RTCC Room	RTU/SAS	None
Room type and Floor	Blocks/stones	Marshalling	None
Ceiling type	Concrete	Cable Routes	See Drawing/Photo
L x W x H in meters	Space Available 30x15 ft	Communication Eqpt	None

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AC Power	415v/240v		
DC Power	110VDC		
Charger	Existing		
Batteries	Available		
Power Distribution Board	AC Existing		
Grounding System	ok		
Security	Room secure		
Access Road	good		

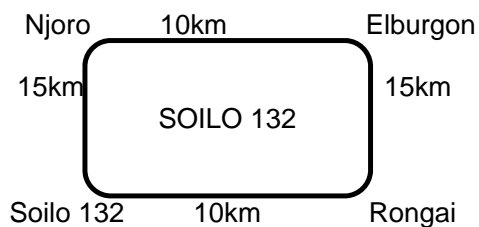
4. RTU : No RTU/SAS

5. **Marshalling Cubicles:** No Marshalling Cubicle

6. **Communication Equipment**

No communication Equipment Available

Possible Communication: Fibre from Njoro/Rongai substation, Point of Presence in Soilo



7. **Room layout**

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Space **may be** available for proposed new equipment. Construction going on and not sure of space allocations

8. AC Supply

AC distribution board available with spare capacity.

9. DC Supply

110 VDC

10. Plant Interface

10.1 Signals list

Appro		Elburgon 33/11kV			
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Equipment 33kV	Signals		
CB	Status, Command		
3 x ISO	3 x Status DPI		
OSM 41	Status , Command		
Equipment 11kV			
OSM 40 Feeder 1	Status , Command		
OSM 19 Feeder 2	Status , Command		
OSM 20 Feeder 3	Status , Command		

Standard Signal list

10.3 Installation and adaptation works: Under Renovation

11. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

12. Notes

distance from the	In town	Type of area	Urban
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site (km)			
Nearby buildings	Homes/town		
Nearby industries		Power supply	240VAC
Type of soil	Red soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	RCC

Station Important Elburgon Town and Environs

13. Photographic Report

Appro		Elburgon 33/11kV		
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Site Survey Report

To: Nicholas Kiminda

Station: Gilgil 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Nicholas Kiminda	Cable Trenches	None
Survey Date	August 13, 2014		
Station Name & Contact	Gilgil 33/11kV		
Region & Town	Kikopy		
Distance to Site(km)	1 km from Naivasha Nairobi rd		
Station Coordinates			
Access Road	Off Naivasha Road		

2x2.5MVA TX

2. Drawings

Station drawings to be collected from Protection team, Naivasha

3. Equipment Room

No Equipment Room

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4. RTU : No RTU/SAS

5. **Marshalling Cubicles:** None

6. **Communication Equipment**

No communication Equipment Available

Possible Communication: ADSS Fibre.

7. **AC Supply**

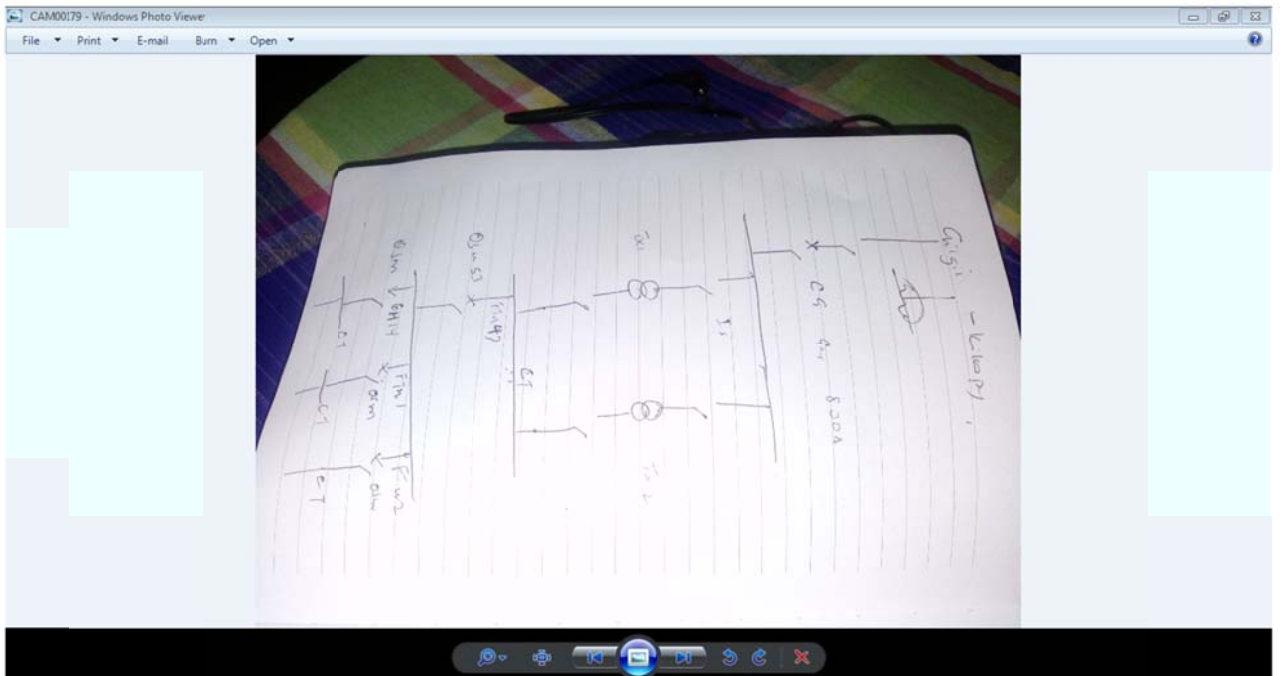
Available

8. **DC Supply**

110 VDC

9. **Plant Interface**

9.1 **Signals list:** Standard Signal list



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Equipment 33kV	Signals		
CB CG GAS 800A	Status, Command		
3 x ISO	3 x Status DPI		
OSM 41	Status , Command		
Equipment 11kV			
2x Incomer	2x DPI for ISO		
OSM 53	Status , Command		
OSM Feeder 1	Status , Command		
OSM Feeder 2	Status , Command		
OSM Feeder 3	Status , Command		

9.2 Installation and adaptation works: will be Extensive

10. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

11. Notes

distance from the	In town	Type of area	Urban
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site (km)			
Nearby buildings	Homes/town		
Nearby industries		Power supply	240VAC
Type of soil	Red soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	RCC

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Site Survey Report

To: Nicholas Kiminda

Station: Kihoto 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Nicholas Kiminda	Cable Trenches	OK
Survey Date	August 13, 2014		
Station Name & Contact	Kihoto 33/11kV		
Region & Town	Naivasha		
Distance to Site(km)	Naivasha Town		
Station Coordinates			
Access Road	Off Naivasha Road		

1x7.5MVA TX

2. Drawings

Station drawings to be collected from Protection team, Nakuru
SLD Sketch. Station newly built by Siemens

3. Equipment Room

No space for extra Panel

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			Error!	Error!	Error! Unknown 4

4. RTU : No RTU/SAS

5. **Marshalling Cubicles:** Marshalling Cubicles exist for the controls

6. **Communication Equipment**

No communication Equipment Available

Possible Communication: Fibre from Naivasha Stima Office

7. **AC Supply**

Available

8. **DC Supply**

110 VDC

9. **Plant Interface**

9.1 **Signals list:** Standard Signal list

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		Dept	Projects		
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9.2 Installation and adaptation works: Newly Built

10. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

11. Notes

distance from the site (km)	In town	Type of area	Urban
Nearby buildings	Homes/town		
Nearby industries		Power supply	240VAC
Type of soil	Red soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	RCC

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Site Survey Report

To: George Ngugi

Station: Marula 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Daniel Gachanja	Cable Trenches	OK,
Survey Date	August 23th, 2014		
Station Name & Contact	Marula ,33/11kV		
Region &Town	Central rift, Naivasha Town		
Distance to Site(km)	6km from Town		
Station Coordinates	Place: -0.645899, 36.383962		
Access Road	Naivasha-Nakuru Rd		
Capacity	2X7.5 MVA		
Station Voltage	33/11kV		

Cable Trenches

Appr	13/08/2014	Kakamega 33/11kV	Error! Unknown document property name.		
Report on Site Visit		Projects			
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2. Drawings

Station drawings to be collected from Protection team, Naivasha

3. Equipment Room

Location	RTCC Room	RTU/SAS	None
Room type and Floor	Blocks/stones	Marshalling	None
Ceiling type	Galsheet	Cable Routes	See Drawing/Photo
L x W x H in meters	Space Available 8x5 X3 m	Communication Eqpt	No equipments
AC Power	415v/240v		
DC Power	110VDC		
Charger	Existing		
Batteries	Available for 30V DC		
Power Distribution Board	AC Existing		
Grounding System	ok		
Security	Room secure		
Access Road	good		

4. RTU: No RTU/SAS

5. Marshalling Cubicles: No Marshalling Cubicle

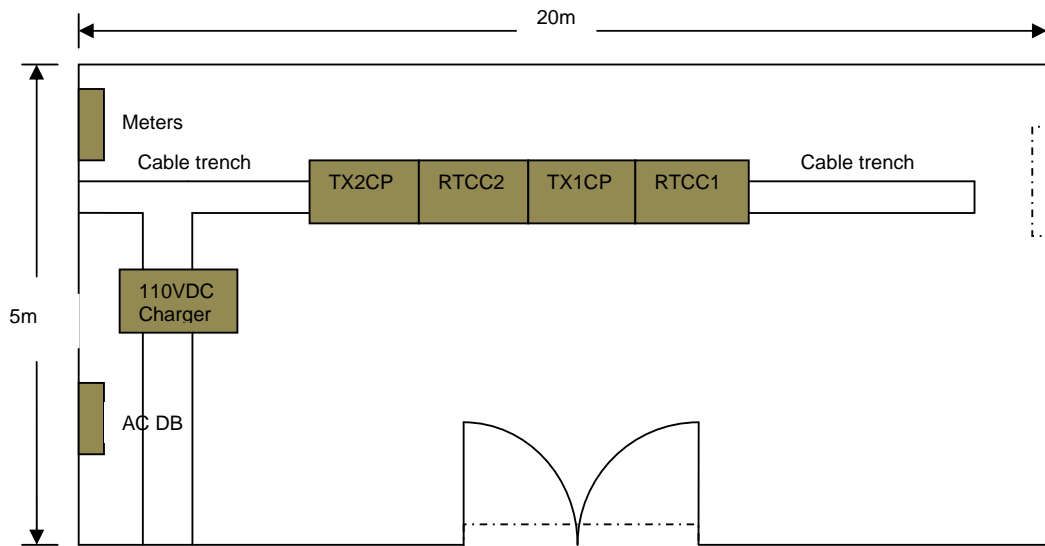
6. Communication Equipment

No communication equipment,

Proposed communication through fibre from KPLC office, Naivasha 6 km away.

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7. Room layout



Space is available for proposed new equipment.

8. AC Supply

AC distribution board available with spare capacity.

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9. DC Supply

30 VDC

10. Single Line Diagram

11. Plant Interface

Equipment 33Kv	Data Points	SPI	DPI	SCO	DCO/ RCO	AMI	MWHR	MVHR
Incoming Lines & Busbar	Indications							
NAIV1 ISO X340	Status, OPEN, CLOSE		1					
NAIV2 ISO	Status, OPEN, CLOSE		1					
NAIV1 Main Protection 1 Trip	Status, Trip /Reset	1						
NAIV1 Backup Protection Trip	Status, Trip /Reset	1						
NAIV1 PT Fail	Status, Alarm,/Normal	1						
NAIV1 Trip Circuit Faulty	Status, Alarm,/Normal	1						
NAIV1 Protection/Relay Faulty	Status, Alarm,/Normal	1						
NAIV1 SF6 Gas Low	Status, Alarm,/Normal	1						
NAIV1 CB Spring Charging Failure	Status, Alarm,/Normal	1						
NAIV1 Auto-reclose Operated	Status, Operated, Normal	1						
NAIV2 Main Protection 1 Trip	Status, Trip /Reset	1						
NAIV2 Backup Protection Trip	Status, Trip /Reset	1						
NAIV2 PT Fail	Status, Alarm,/Normal	1						
NAIV2 Trip Circuit Faulty	Status, Alarm,/Normal	1						

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NAIV2 Protection/Relay Faulty	Status, Alarm,/Normal	1						
NAIV2 SF6 Gas Low	Status, Alarm,/Normal	1						
NAIV2 CB Spring Charging Failure	Status, Alarm,/Normal	1						
NAIV2 Auto-reclose Operated	Status, Operated, Normal	1						
	Commands							
NAIV1 Master reset	Command, Reset				1			
NAIV2 Master reset	Command, Reset				1			
	Analogues							
NAIV1, Active Power	MW					1		
NAIV1, Reactive Power	MVAR					1		
		SPI	DPI	SCO	DCO/RCO	AMI	MWHR	MVHR
NAIV1, Line Voltage	kV					1		
NAIV1, Active Energy	MWHR					1		
NAIV1 reactive Energy	MVHR					1		
NAIV2 Active Power	MW					1		
NAIV2, Reactive Power	MVAR					1		
NAIV2, Line Voltage	kV					1		
NAIV2, Active Energy	MVHR					1		
NAIV2, Active Energy	MVHR					1		
33kV Bus Voltage	kV					1		
33/11Kv , TX1	Indications							
ISO X442	Status, OPEN, CLOSE		1					
VWVE02	Status, OPEN, CLOSE		1					
ISO X443	Status, OPEN, CLOSE		1					
ISO Y409	Status, Open/Close		1					
FTU49	Status, Open /Close		1					
ISO Y205	Status, Open /Close		1					
ISO X206	Status, Open /Close		1					
KFE 04	Status, Open /Close		1					
ISO Y	Status, Open /Close		1					
Auto/Manual	Status, Auto/Manual		1					
Master /Follower	Status, Master/Follower		1					
Local/ Remote	Status, Local/Remote		1					
Temperature Alarm, TTA	Status, Alarm,/Normal	1						

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Temperature Trip,TTT	Status, Trip /Reset	1						
Buchholz Alarm, TBA	Status, Alarm/Normal	1						
Buchholz Trip, TBT	Status, Trip /Reset	1						
TXr Oil Level (Low and High), TOL	Status, Alarm/Normal	1						
TX Cooling fan Trouble , TCT	Status, Trip /Reset	1						
TX OLTC Control/Supply Failure , TCC	Status, Alarm/Normal	1						
Transformer General Alarm, TGA	Status, Alarm/Normal	1						
Transformer General Trip, TGT	Status, Trip /Reset	1						
<i>Main Protection 1 Trip</i>	Status, Trip /Reset	1						
<i>Backup Protection Trip</i>	Status, Trip /Reset	1						
			SPI	DPI	SCO	DCO/ RCO	AMI	MWHR
<i>PT Fail</i>	Status, Alarm,/Normal	1						
<i>CBX Trip Circuit Faulty</i>	Status, Alarm,/Normal	1						
<i>Protection/Relay Faulty</i>	Status, Alarm,/Normal	1						
<i>CBX SF6 Gas Low</i>	Status, Alarm,/Normal	1						
<i>CBX Spring Charging Failure</i>	Status, Alarm,/Normal	1						
<i>OSM31 Trip Circuit Faulty</i>	Status, Alarm,/Normal	1						
<i>OSM31 SF6 Gas low</i>	Status, Alarm,/Normal	1						
<i>OSM31 Control Box Faulty</i>	Status, Alarm,/Normal	1						
<i>Auto-reclose Operated</i>	Status, Operated, Normal	1						
	Commands							
CB X	Commands, OPEN/ CLOSE					1		
OSM 31	Commands, Open /Close					1		
TX1, Auto/ Manual	Command , Auto /Manual					1		
TX1, Master/ Follower	Command, Master/ Follower					1		
TX1 TC RAISE/LOWER	Command, Raise/Lower					1		
TX1 Reset Command	Command, Reset				1			
	Analogues							
TX1 TAP position	No.						1	
TX1 Active Power	MW						1	

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TX1, Reactive Power	MVAR					1		
TX1, Line Voltage	kV					1		
33/11Kv, TX2	Indications							
ISO X113	Status, OPEN, CLOSE		1					
8T0	Status, OPEN, CLOSE		1					
ISO X358	Status, Open /Close		1					
FTU44	Status, Open /Close		1					
Y378	Status, Open /Close		1					
Auto/Manual	Status, Auto/Manual		1					
Master /Follower	Status, Master/Follower		1					
Local/ Remote	Status, Local/Remote		1					
		SPI	DPI	SCO	DCO/ RCO	AMI	MWHR	MVHR
Temperature Alarm, TTA	Status, Alarm,/Normal	1						
Temperature Trip,TTT	Status, Trip /Reset	1						
Buchholz Alarm, TBA	Status, Alarm,/Normal	1						
Buchholz Trip, TBT	Status, Trip /Reset	1						
Txr Oil Level (Low and High), TOL	Status, Alarm,/Normal	1						
TX Cooling fan Trouble , TCT	Status, Trip /Reset	1						
TX OLTC Control/Supply Failure , TCC	Status, Alarm,/Normal	1						
Transformer General Alarm, TGA	Status, Alarm,/Normal	1						
Transformer General Trip, TGT	Status, Trip /Reset	1						
<i>Main Protection 1 Trip</i>	Status, Trip /Reset	1						
<i>Backup Protection Trip</i>	Status, Trip /Reset	1						
<i>PT Fail</i>	Status, Alarm,/Normal	1						
<i>8T0 Trip Circuit Faulty</i>	Status, Alarm,/Normal	1						
<i>Protection/Relay Faulty</i>	Status, Alarm,/Normal	1						
<i>8T0 SF6 Gas Low</i>	Status, Alarm,/Normal	1						
<i>8T0 Spring Charging Failure</i>	Status, Alarm,/Normal	1						
<i>FTU44 Trip Circuit Faulty</i>	Status, Alarm,/Normal	1						
<i>FTU44 SF6 Gas low</i>	Status, Alarm,/Normal	1						
<i>FTU Control Box Faulty</i>	Status, Alarm,/Normal	1						
	Commands							
FTU44	Command, OPEN/CLOSE				1			
8T0	Command, OPEN/CLOSE				1			

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TX2, Auto/ Manual	Command ,Auto /Manual				1			
TX2, Master/ Follower	Command, Master/ Follower				1			
TX2 TC RAISE/LOWER	Command, Raise, Lower				1			
TX2 Reset Command	Command, Reset			1				
	Analogues							
TX2 TAP position	No.					1		
TX2 Active Power	MW					1		
TX2, Reactive Power	MVAR					1		
TX2, Line Voltage	kV					1		
11kV	Indications							
		SPI	DPI	SCO	DCO/ RCO	AMI	MWHR	MVHR
FTU6	Status, Open /Close		1					
Y217	Status, Open /Close		1					
Y379	Status, Open /Close		1					
Y232	Status, Open /Close		1					
FTU34	Status, Open /Close		1					
FTU6 Main Protection 1 Trip	Status, Trip /Reset	1						
FTU6 <i>Control Box Faulty</i>	Status, Alarm,/Normal	1						
FTU6 <i>SF6 Gas Low</i>	Status, Alarm,/Normal	1						
FTU6 <i>Auto-reclose Operated</i>	Status, Alarm,/Normal	1						
FTU34 Main Protection 1 Trip	Status, Trip /Reset	1						
FTU34 <i>Control Box Faulty</i>	Status, Alarm,/Normal	1						
FTU34 <i>SF6 Gas Low</i>	Status, Alarm,/Normal	1						
FTU34 <i>Auto-reclose Operated</i>	Status, Alarm,/Normal	1						
	Commands							
FTU6	Command, OPEN, CLOSE				1			
<i>FTU6 Master reset</i>	Command, Reset			1				
FTU34	Command, OPEN, CLOSE				1			
<i>FTU34 Master reset</i>	Command, Reset			1				
	Analogues							
FTU6 current	I, Amps					1		
FTU34 current	I, Amps					1		
<i>11kV Bus Voltage</i>	kV					1		

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Station	Indications							
110VDC Battery Charger Trouble(CA1)	Status, Alarm,/Normal	1						
48VDC Battery Charger A Trouble(CA2)	Status, Alarm,/Normal	1						
Protection Panel DC Supply Trip(PPS)	Status, Alarm,/Normal	1						
RTU alarm (RTU)	Status, Alarm,/Normal	1						

12.

Standard Signal list

12.1 Installation and adaptation works

Cable trenches adequate and no challenges expected.

13. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

14. Notes

distance from the site (km)	1 km from Town	Type of area	Urban
Nearby buildings	Homes/town		
Nearby industries		Power supply	415VAC
Type of soil	Mixed soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	Lessos RCC

Station Important Nyahururu town and environs

15. Photographic Report

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Site Survey Report

To: Nicholas Kiminda

Station: Mwariki 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Nicholas Kiminda	Cable Trenches	OK
Survey Date	August 13, 2014		
Station Name & Contact	Mwariki 33/11kV		
Region & Town	Nakuru		
Distance to Site(km)	5 km from Nakuru Town		
Station Coordinates			
Access Road	Kanu Street		

1x7.5MVA TX

2. Drawings

Station drawings to be collected from Protection team, Nakuru
 SLD Sketch. Station newly built by Siemens

3. Equipment Room

No space for extra Panel

Appr		Error! Unknown document	Mwariki 33/11kV		
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4. RTU : No RTU/SAS

5. **Marshalling Cubicles:** Marshalling Cubicles exist for the controls

6. **Communication Equipment**

No communication Equipment Available

Possible Communication: Fibre from Nakuru Stima /Nakuru Depot

7. **AC Supply**

Available

8. **DC Supply**

110 VDC

9. **Plant Interface**

9.1 **Signals list:** Standard Signal list

Appro	13/08/2014	Mwariki 33/11kV			
Report on Site Visit		Error! Unknown document property name.			
		Dept	Projects		
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9.2 Installation and adaptation works: Newly Built

10. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

11. Notes

distance from the site (km)	In town	Type of area	Urban
Nearby buildings	Homes/town		
Nearby industries		Power supply	240VAC
Type of soil	Red soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	RCC

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Site Survey Report

To: Nicholas Kiminda

Station: Njoro 33/11kV SUBSTATION

1. General: Information

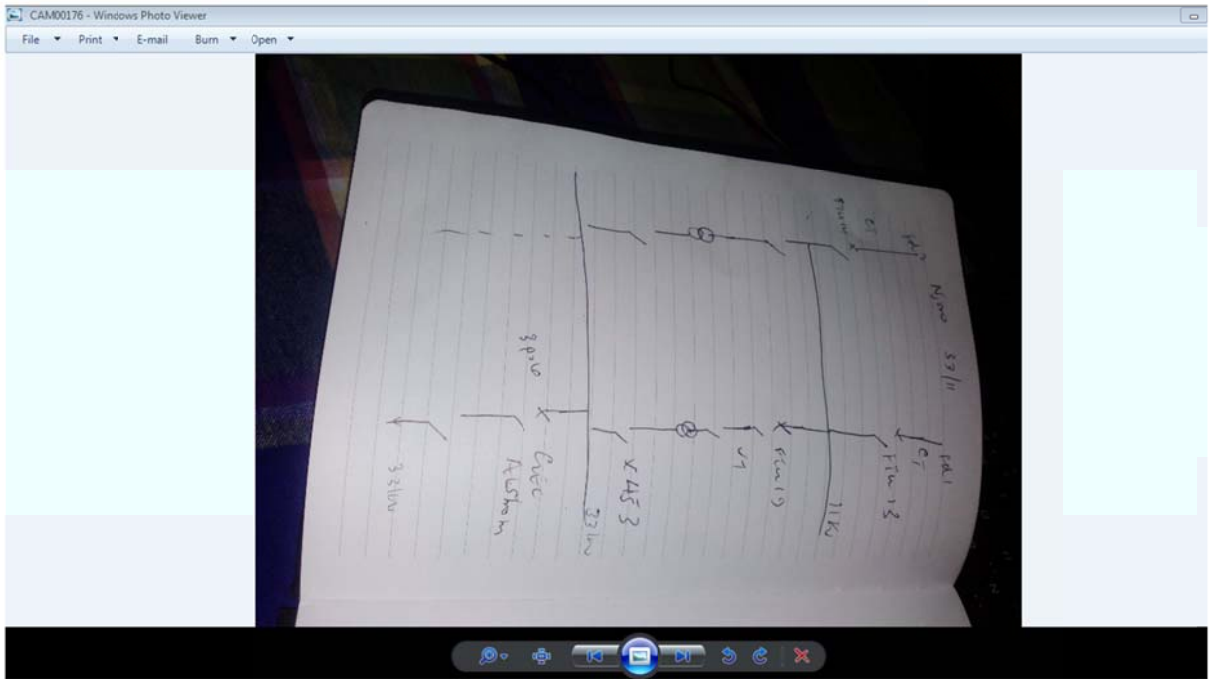
Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Nicholas Kiminda	Cable Trenches	OK, 22 Inches
Survey Date	August 13, 2014		
Station Name & Contact	Njoro 33/11kV		
Region & Town	Njoro near Kari Egerton Univ		
Distance to Site(km)	15 km from Nakuru		
Station Coordinates			
Access Road	Nakuru Njoro Rd		

2x2.5MVA TX

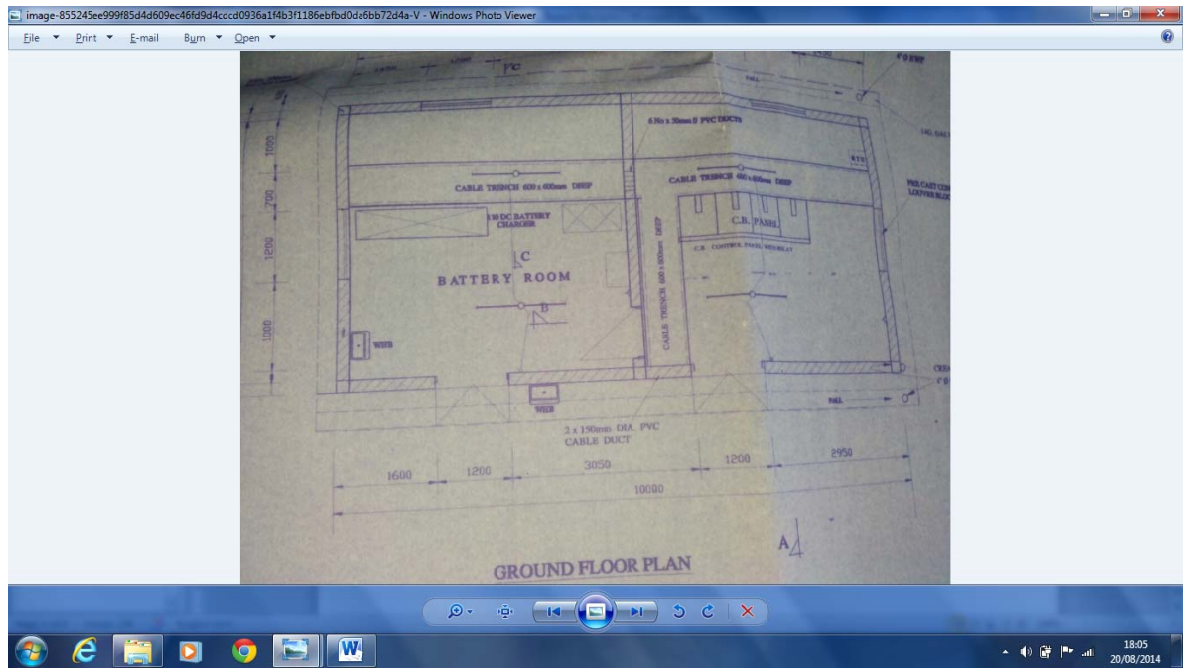
2. Drawings

Station drawings to be collected from Protection team, Nakuru
SLD Sketch

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3. Equipment Room



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4. RTU : No RTU/SAS

5. **Marshalling Cubicles:** No Marshalling Cubicle

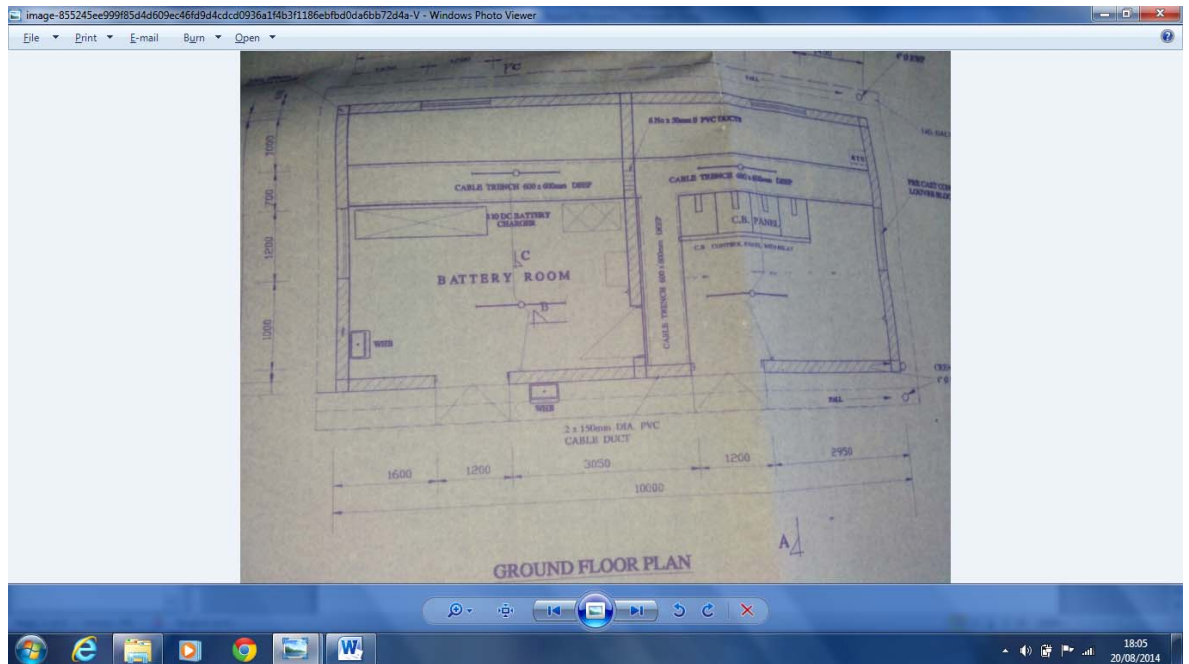
6. **Communication Equipment**

No communication Equipment Available

Possible Communication: Fibre from Njoro/Rongai substation, Point of Presence in Soilo



7. **Room layout**



Space **may be** available for proposed new equipment. Construction going on and not sure of space allocations

8. **AC Supply**

Available

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9. DC Supply

110 VDC

10. Plant Interface

10.1 **Signals list:** Standard Signal list

Equipment 33kV	Signals	
CB , GE Alstrom, 3 pole	DPI, DCO	
2 x ISO	2 x Status DPI	
X 453 ISO	Status	
Equipment 11kV		
Incomer, FTU19	DPI, DCO	
FTU 13 Feeder 1	Status , Command	
FTU 14 Feeder 2	Status , Command	

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10.2 Installation and adaptation works: Under Renovation

11. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

12. Notes

distance from the site (km)	In town	Type of area	Urban
Nearby buildings	Homes/town		
Nearby industries		Power supply	240VAC
Type of soil	Red soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	RCC

Station Important Kari, Njoro and Egerton University

13. Photographic Report

Appro		Njoro 33/11kV	
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Site Survey Report

To: George Ngugi

Station: Nyahururu 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Daniel Gachanja	Cable Trenches	OK,
Survey Date	August 23th, 2014		
Station Name & Contact	Nyahururu ,33/11kV		
Region &Town	Central rift, Nyahururu Town		
Distance to Site(km)	1km to Town		
Station Coordinates	Place: 0.026242,36.365207 Altitude: 2369 meters		
Access Road	Gilgil-Nyahuru Rd		
Capacity	2X7.5 MVA		
Station Voltage	33/11kV		

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Cable Trenches

Available and adequate

2. Drawings

Station drawings to be collected from Protection team, Nakuru

3. Equipment Room

Location	RTCC Room	RTU/SAS	None
Room type and Floor	Blocks/stones	Marshalling	None
Ceiling type	Galsheet	Cable Routes	See Drawing/Photo
L x W x H in meters	Space Available 6x4.6 X3 m	Communication Eqpt	No equipments
AC Power	415v/240v		
DC Power	110VDC		
Charger	Existing		
Batteries	Available for 110V DC		
Power Distribution Board	AC Existing		
Grounding System	ok		
Security	Room secure		
Access Road	good		

4. RTU: No RTU/SAS

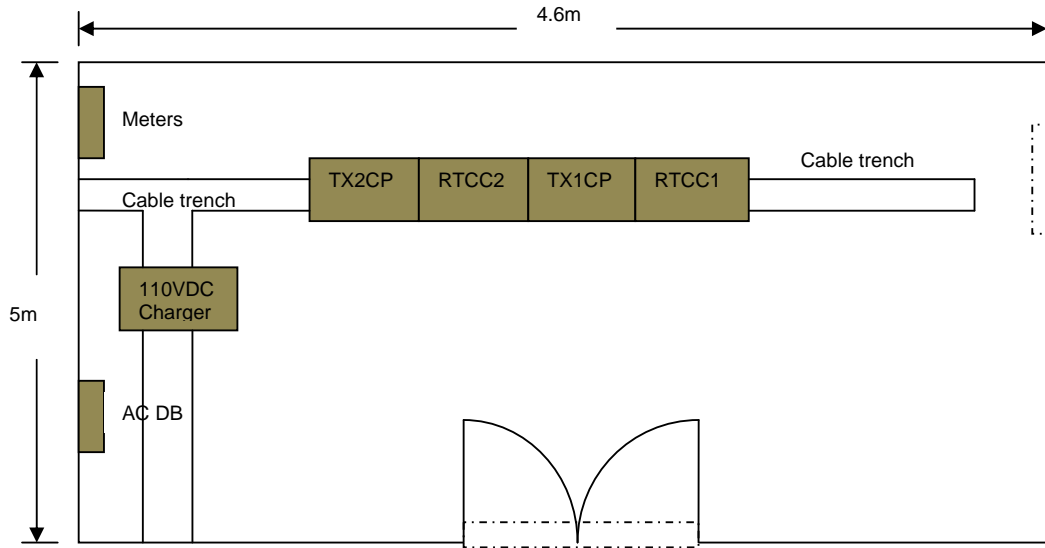
5. Marshalling Cubicles: No Marshalling Cubicle

6. Communication Equipment

No communication equipment,

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7. Room layout



Space is available for proposed new equipment.

8. AC Supply

AC distribution board available with spare capacity.

9. DC Supply

30 VDC

10. Single Line Diagram

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11. Plant Interface

Equipment 33Kv	Data Points	SPI	DPI	SCO	DCO/ RCO	AMI	MWHR	MVHR
Incoming Lines & Busbar	Indications							
ISO X406	Status, OPEN, CLOSE		1					
ISO X500	Status, OPEN, CLOSE		1					
ISO X498	Status, OPEN, CLOSE		1					
Viper 42 CB	Status, OPEN, CLOSE		1					
Lanet1 <i>Main Protection 1 Trip</i>	Status, Trip /Reset	1						
Lanet1 <i>Backup Protection</i>	Status, Trip /Reset	1						

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Trip								
Lanet1 PT Fail	Status, Alarm,/Normal	1						
Lanet1 Trip Circuit Faulty	Status, Alarm,/Normal	1						
Lanet1 Protection/Relay Faulty	Status, Alarm,/Normal	1						
Lanet1 SF6 Gas Low	Status, Alarm,/Normal	1						
Lanet1 CB Spring Charging Failure	Status, Alarm,/Normal	1						
Lanet1 Auto-reclose Operated	Status, Operated, Normal	1						
	Commands							
Viper 42CB	Command, OPEN, CLOSE				1			
Master reset	Command, Reset			1				
	Analogues							
Lanet1, Active Power	MW					1		
Lanet1, Reactive Power	MVAR					1		
Lanet1, Line Voltage	kV					1		
Lanet1, Active Energy	MWHR					1		
Lanet1 reactive Energy	MVHR					1		
Lanet2 Active Power	MW					1		
Lanet2, Reactive Power	MVAR					1		
Lanet2, Line Voltage	kV					1		
Lanet2, Active Energy	MVHR					1		
Lanet2, Active Energy	MVHR					1		
		SPI	DPI	SCO	DCO/RCO	AMI	MWHR	MVHR
33kV Bus Voltage	kV					1		
33/11Kv , TX1	Indications							
ISO X131	Status, OPEN, CLOSE		1					
CB X	Status, OPEN, CLOSE		1					
ISO X501	Status, OPEN, CLOSE		1					
ISO X359	Status, Open/Close		1					
OSM 31	Status, Open /Close		1					
ISO 1	Status, Open /Close		1					
Auto/Manual	Status, Auto/Manual		1					

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Master /Follower	Status, Master/Follower		1					
Local/ Remote	Status, Local/Remote		1					
Temperature Alarm, TTA	Status, Alarm/Normal	1						
Temperature Trip,TTT	Status, Trip /Reset	1						
Buchholz Alarm, TBA	Status, Alarm/Normal	1						
Buchholz Trip, TBT	Status, Trip /Reset	1						
TXr Oil Level (Low and High), TOL	Status, Alarm/Normal	1						
TX Cooling fan Trouble , TCT	Status, Trip /Reset	1						
TX OLTC Control/Supply Failure , TCC	Status, Alarm/Normal	1						
Transformer General Alarm, TGA	Status, Alarm/Normal	1						
Transformer General Trip, TGT	Status, Trip /Reset	1						
<i>Main Protection 1 Trip</i>	Status, Trip /Reset	1						
<i>Backup Protection Trip</i>	Status, Trip /Reset	1						
<i>PT Fail</i>	Status, Alarm/Normal	1						
<i>CBX Trip Circuit Faulty</i>	Status, Alarm/Normal	1						
<i>Protection/Relay Faulty</i>	Status, Alarm/Normal	1						
<i>CBX SF6 Gas Low</i>	Status, Alarm/Normal	1						
<i>CBX Spring Charging Failure</i>	Status, Alarm/Normal	1						
<i>OSM31 Trip Circuit Faulty</i>	Status, Alarm/Normal	1						
<i>OSM31 SF6 Gas low</i>	Status, Alarm/Normal	1						
<i>OSM31 Control Box Faulty</i>	Status, Alarm/Normal	1						
		SPI	DPI	SCO	DCO/ RCO	AMI	MWHR	MVHR
<i>Auto-reclose Operated</i>	Status, Operated, Normal	1						
	Commands							
CB X	Commands, OPEN/ CLOSE				1			
OSM 31	Commands, Open /Close				1			
TX1, Auto/ Manual	Command , Auto /Manual				1			
TX1, Master/ Follower	Command, Master/ Follower				1			
TX1 TC RAISE/LOWER	Command, Raise/Lower				1			

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TX1 Reset Command	Command, Reset				1				
	Analogues								
TX1 TAP position	No.					1			
TX1 Active Power	MW					1			
TX1, Reactive Power	MVAR					1			
TX1, Line Voltage	kV					1			
33/11Kv, TX2	Indications								
ISO X113	Status, OPEN, CLOSE		1						
8T0	Status, OPEN, CLOSE		1						
ISO X358	Status, Open /Close		1						
FTU44	Status, Open /Close		1						
Y378	Status, Open /Close		1						
Auto/Manual	Status, Auto/Manual		1						
Master /Follower	Status, Master/Follower		1						
Local/ Remote	Status, Local/Remote		1						
Temperature Alarm, TTA	Status, Alarm,/Normal	1							
Temperature Trip,TTT	Status, Trip /Reset	1							
Buchholz Alarm, TBA	Status, Alarm,/Normal	1							
Buchholz Trip, TBT	Status, Trip /Reset	1							
Txr Oil Level (Low and High), TOL	Status, Alarm,/Normal	1							
TX Cooling fan Trouble , TCT	Status, Trip /Reset	1							
TX OLTC Control/Supply Failure , TCC	Status, Alarm,/Normal	1							
			SPI	DPI	SCO	DCO/RCO	AMI	MWHR	MVHR
Transformer General Alarm, TGA	Status, Alarm,/Normal	1							
Transformer General Trip, TGT	Status, Trip /Reset	1							
<i>Main Protection 1 Trip</i>	Status, Trip /Reset	1							
<i>Backup Protection Trip</i>	Status, Trip /Reset	1							
<i>PT Fail</i>	Status, Alarm,/Normal	1							
<i>8T0 Trip Circuit Faulty</i>	Status, Alarm,/Normal	1							
<i>Protection/Relay Faulty</i>	Status, Alarm,/Normal	1							
<i>8T0 SF6 Gas Low</i>	Status, Alarm,/Normal	1							
<i>8T0 Spring Charging Failure</i>	Status, Alarm,/Normal	1							

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FTU44 Trip Circuit Faulty	Status, Alarm,/Normal	1						
FTU44 SF6 Gas low	Status, Alarm,/Normal	1						
FTU Control Box Faulty	Status, Alarm,/Normal	1						
	Commands							
FTU44	Command, OPEN/CLOSE				1			
8T0	Command, OPEN/CLOSE				1			
TX2, Auto/ Manual	Command ,Auto /Manual				1			
TX2, Master/ Follower	Command, Master/ Follower				1			
TX2 TC RAISE/LOWER	Command, Raise, Lower				1			
TX2 Reset Command	Command, Reset			1				
	Analogues							
TX2 TAP position	No.					1		
TX2 Active Power	MW					1		
TX2, Reactive Power	MVAR					1		
TX2, Line Voltage	kV					1		
	11kV							
	Indications							
FTU6	Status, Open /Close		1					
Y217	Status, Open /Close		1					
Y379	Status, Open /Close		1					
Y232	Status, Open /Close		1					
FTU34	Status, Open /Close		1					
FTU6 Main Protection 1 Trip	Status, Trip /Reset	1						
			SPI	DPI	SCO	DCO/ RCO	AMI	MWHR
FTU6 Control Box Faulty	Status, Alarm,/Normal	1						
FTU6 SF6 Gas Low	Status, Alarm,/Normal	1						
FTU6 Auto-reclose Operated	Status, Alarm,/Normal	1						
FTU34 Main Protection 1 Trip	Status, Trip /Reset	1						
FTU34 Control Box Faulty	Status, Alarm,/Normal	1						
FTU34 SF6 Gas Low	Status, Alarm,/Normal	1						
FTU34 Auto-reclose Operated	Status, Alarm,/Normal	1						
	Commands							
FTU6	Command, OPEN, CLOSE				1			

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FTU6 Master reset	Command, Reset			1				
FTU34	Command, OPEN, CLOSE				1			
FTU34 Master reset	Command, Reset			1				
	Analogues							
FTU6 current	I, Amps					1		
FTU34 current	I, Amps					1		
11Kv Bus Voltage	kV					1		
Station	Indications							
110VDC Battery Charger Trouble(CA1)	Status, Alarm,/Normal	1						
48VDC Battery Charger A Trouble(CA2)	Status, Alarm,/Normal	1						
Protection Panel DC Supply Trip(PPS)	Status, Alarm,/Normal	1						
RTU alarm (RTU)	Status, Alarm,/Normal	1						

12.

Standard Signal list

12.1 Installation and adaptation works

Cable trenches adequate and no challenges expected.

13. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

14. Notes

distance from the site (km)	1 km from Town	Type of area	Urban
Nearby buildings	Homes/town		
Nearby industries		Power supply	415VAC
Type of soil	Mixed soil		
Water availability			
Special authority	Permit of work	Pass issued	Lessos RCC

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Station Important Nyahururu town and environs

15. Photographic Report

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Site Survey Report

To: Nicholas Kiminda

Station: Rongai 33/11kV SUBSTATION

1. General: Information

Project	Site Survey	Station Voltage	33/11kV
Site Survey Engineers	Nicholas Kiminda	Cable Trenches	OK, 14 Inches
Survey Date	August 13, 2014		
Station Name & Contact	Rongai 33/11kV		
Region & Town	Salгаа, Nakuru		
Distance to Site(km)	10km from Nakuru		
Station Coordinates			
Access Road	Off Nakuru Eldoret Rd		

2x7.5MVA TX

2. Drawings

Station drawings to be collected from Protection team, Nakuru

3. Equipment Room

Location	RTCC Room	RTU/SAS	None
Room type and Floor	Blocks/stones	Marshalling	None
Ceiling type	Galsheet	Cable Routes	See Drawing/Photo
L x W x H in meters	Space Available 20x15 ft	Communication Eqpt	None

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AC Power	415v/240v		
DC Power	30VDC		
Charger	Existing		
Batteries	12x1.2 DC Avail		
Power Distribution Board	AC Existing		
Grounding System	ok		
Security	Room secure		
Access Road	good		

4. RTU : No RTU/SAS

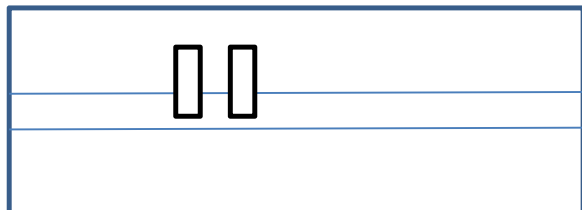
5. **Marshalling Cubicles:** No Marshalling Cubicle

6. **Communication Equipment**

No communication Equipment Available

Possible Communication: Fibre from Soilo substation Point of Presence 5km away

7. **Room layout**



→ Cable Trench having 2 RTCC panels

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Space is available for proposed new equipment.

8. AC Supply

AC distribution board available with spare capacity.

9. DC Supply

30 VDC

10. Plant Interface

10.1 Signals list

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Equipment 33kV	Signals		
CB	Status, Command		
4 x ISO	4 x Status DPI		
OSM 22	Status , Command		
FTM 28	Status , Command		
Equipment 11kV			
FTU 23 Kabarak Fdr	Status , Command		
OSM 23 Molo Fdr	Status , Command		
FTU 22 Rongai Fdr	Status , Command		

Standard Signal list

10.2 Installation and adaptation works

No challenges expected

11. Enclosures

9.1	Site Survey Report
9.2	Detailed plant drawings
9.3	Control Room layout
9.4	Equipment Room Layout
9.4	

Appro		SubSTATION			
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12. Notes

distance from the site (km)	In town	Type of area	Urban
Nearby buildings	Homes/town		
Nearby industries		Power supply	240VAC
Type of soil	Red soil		
Water availability			
Special authority pass	Permit of work	Pass issued by:	RCC

Station Important Salgaa ,Molo and Kabarak

13. Photographic Report

Appro		Substation			
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