

# HV Cable Commissioning Test Report



Region:	Town:	Location:
From (source):	To (destination):	Cable Number:

**Preliminary Details:**

Cable Type:	Rated Voltage:	Conductor Type and Size:	Approx Length:	Cable Age (if known):

**Sheath Insulation Resistance**

Readings in Megohms

Instrument Number:

Test Voltage: 1 kV for 1Min

Single Phase Cables		
A phase	B phase	C phase

or

3 Phase Cables
Sheath

**Core Insulation Resistance**

Readings in Megohms

Instrument Number:

		A to B+C+E	B to A+C+E	C to A+B+E
All U/G HV Cables	@ 1Min			
	@ 2Min			
	@ 5Min			
Test Voltage: (5 kV for 11kV) & (10 kV for 22 & 33kV)	@ 1Min			
	@ 2Min			
	@ 5Min			
After H.V. Test (Major Cables Only)	@ 1Min			
	@ 2Min			
	@ 5Min			

**A major HV underground cable would be defined as:**

- > All 33kV cables
- > 22kV cables greater than 185mm<sup>2</sup> Cu or 300mm<sup>2</sup> Al
- > 11kV cables greater than 240mm<sup>2</sup> Cu or 400mm<sup>2</sup> Al
- > All zone substation and feeder exit cables

**Note:** SWER cable will be treated as minor cable. Feeder exits will still be major cables.

**High Voltage Withstand Test (Major Cables Only)**

Parallel cores to be tested as one core

Instrument Number:

**A.C. (V.L.F) - XLPE and PILC CABLES**

Connection (3 phase cables)			Voltage (Peak)	Test Duration	Start Leakage (mA)	Finish Leakage (mA)
A & B	To	C & E		30min.		
B & C	To	A & E		30min.		
Connection (Single phase or triplex )			Voltage (Peak)	Test Duration	Start Leakage (mA)	Finish Leakage (mA)
A & B & C	To	E		30min.		

**D.C. - ONLY TO USED ON PILC CABLES IF VLF UNAVAILABLE**

Connection			Voltage	Test Duration	Start Leakage (mA)	Finish Leakage (mA)
A&B&C	To	E		15min.		
A	To	B&C		15min.		
C	To	A&B		15min.		

Phasing Correct	Yes / No	Frame Leakage insulation okay:	Yes / No / NA
Screen/Sheath Earthing Correct:	Yes / No	SDs/VT connected:	Yes / No / NA
Lugs bolted securely:	Yes / No	Insulating barriers/boots fitted	Yes / No / NA
Cable number marked:	Yes / No	Operational nameplate fitted:	Yes / No / NA
Screen/Sheath reconnected after test:	Yes / No / NA	Closed Ferrous path around single core cable:	Yes / No / NA
		Insulated Plugs Fitted to Tee connectors:	Yes / No / NA

**REMARKS:**

Weather conditions -

**CAUTION:** For cables that have not undergone an applied high voltage withstand test, it is advisable to observe a 24 hour restriction period following energising. Refer to Section 5.13 of SWP SP0407.

File Name: Location\_From\_To\_CableNumber\_Date.doc e-mail to "Cable Test Results"  
 Filing Location: \\ecasd01\Protection\Test Data - (Test-Commissioning-Maintenance)\<Region>\Cable Tests\<Town>

TEST OFFICER:	DATE:	SUPERVISOR:
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# HV Cable Commissioning Test Report



## 1) Sheath Test Criteria – New HDPE Sheaths

Cable Length / Size	250m	500m	1000m	2000m
<b>11kV or less</b>	<b>MΩ</b>	<b>MΩ</b>	<b>MΩ</b>	<b>MΩ</b>
400mm <sup>2</sup>	250	125	60	30
185 - 240mm <sup>2</sup>	300	150	75	37
35mm <sup>2</sup>	500	250	125	62
<b>22kV or more</b>	<b>MΩ</b>	<b>MΩ</b>	<b>MΩ</b>	<b>MΩ</b>
185 - 630mm <sup>2</sup>	500	250	125	62
35mm <sup>2</sup>	400	200	100	50

## 2) Sheath Test Criteria – New PVC Sheaths

The minimum acceptable value is 1 MΩ

## 3) Insulation Resistance Criteria – New XLPE cables

Cable Length / Size	250m	500m	1000m	2000m
<b>11kV or less</b>	<b>GΩ</b>	<b>GΩ</b>	<b>GΩ</b>	<b>GΩ</b>
400mm <sup>2</sup>	16	8	4	2
185 - 240mm <sup>2</sup>	20	10	5	2.5
35mm <sup>2</sup>	40	20	10	5
<b>22kV or more</b>	<b>GΩ</b>	<b>GΩ</b>	<b>GΩ</b>	<b>GΩ</b>
630mm <sup>2</sup>	20	10	5	2.5
185mm <sup>2</sup>	35	17	9	4
35mm <sup>2</sup>	60	30	15	7.5

## 4) HV Withstand Test Voltages – dead switchgear.

New cables use table below, aged cables use 75% of the figures below

Uo/U	DC Test Voltage (kV ph to earth)	DC Test Voltage (kV ph to ph)	VLF Test Voltage (kV pk ph to earth)	50Hz AC Test Voltage (kV RMS ph to earth)	
	15 min	15 min	30 min	1 min	15 min
1.9/3.3	7	10	6	10	6
3.8/6.6	15	20	12	20	12
6.35/11	25	34	19	28	16
12.7/22	50	-	38	50	29
19/33	75	-	57	70	40

## 5) HV Withstand Test Voltages – live switchgear.

New or aged cables

Uo/U	DC Test Voltage (kV ph to earth)	VLF Test Voltage (kV peak ph to earth)	50Hz AC Test Voltage (kV RMS ph to earth)
	1 min	1 min	1 min
1.9/3.3	6	6	5
3.8/6.6	12	12	11
6.35/11	19	19	14
12.7/22	33	33	24
19/33	45	45	32

## 6) Cable Box Clearances

Rated Voltage	Enclosure Type	Phase to Phase clearance (mm)	Phase to Earth clearance (mm)
12 kV	Fully Insulated	45	32
	Air Insulated	<b>127</b> (184)	<b>76</b> (160)
24 kV	Fully Insulated	100	75
	Air Insulated	<b>242</b> (322)	<b>140</b> (280)
36 kV	Fully Insulated	125	100
	Air Insulated	<b>356</b> (437)	<b>222</b> (380)

For comparison "AS2067-1984 Switchgear Assemblies and Ancillary Equipment for alternating Voltages above 1 kV" clearances are shown in brackets and should be used where vermin entry or cable box contamination is possible.