

## DISTRIBUTION COMMISSIONING FORM (DCF) 2.2 – High Voltage Mixed Cable

**Purpose:** This instruction covers the testing and commissioning of all replacements or new installations of high voltage mixed cable.



For more information refer to the *Distribution Commissioning Forms Guideline (EDM 34137510)*

**Note:** Mixed cable refers to different types of cable (different insulation or core materials, or construction methods) that are jointed together. Whenever possible, the individual cables comprising a mixed cable circuit should be tested before jointing. The following tests must be performed before a mixed cable is put into service.

<b>Work Package No:</b>		<b>SPIDAWeb Pick ID:</b>	
<b>Test Site:</b>	<b>Location of Cable (From)</b>		
	<b>(To)</b>		

### 1. Cable Description

Size of conductor:	mm <sup>2</sup>	Length of cable (approximately)	m	No. of in-line joints
Size of Cable:	mm <sup>2</sup>	Cable Function	Transformer Cable	Feeder Cable

### 2. Visual Inspection and Safety Check

• Ring main switch	Does the construction comply with the distribution construction standards and applicable design drawings?	
	Is the switchgear switch in the OFF position?	N/A
• Ring main earth switch	Check the equipment mimic diagram to confirm the earth switch position. Is the switch in the ON position?	N/A
	Has the interlock been disengaged to access the cable/compartments for test purposes?	
• Cap test points	Have the cables been de-energised (with an approved testing device) before proceeding further?	
	Is the earthing system is complete, undamaged and bonded to earth points?	
• Cable surge arresters	Is the cable/equipment free from physical damage?	
	Is the cable clearly marked with each phase colour and labelled (if applicable)?	
	Have the surge arresters been disconnected from the-cable terminations (if applicable)?	

### 3. End to End Phasing Test

	Test Connection	Resistor Values	Test Results
Use a resistor box in conjunction with a 500 V insulation resistance tester to identify the cable end and phases	Red phase – neutral	MΩ	MΩ
	White phase – neutral	MΩ	MΩ
	Blue phase – neutral	MΩ	MΩ

#### 4. Insulation Resistance Test

Conduct an insulation resistance test for 1 to 10 minutes (subject to the length of the cable) or until the reading is stable. Use a 5 kV insulation resistance tester between each phase conductor and each phase conductor to earth. Values should be greater than 200 MΩ.	Test Connection	Resistor Values		Test Results
		Belted	Screened	
	Red to (white & blue) phase & earth/screen	>200 MΩ	>500 MΩ	MΩ
	White to (red & blue) phase & earth/screen	>200 MΩ	>500 MΩ	MΩ
	Blue to (red & white) phase & earth/screen	>200 MΩ	>500 MΩ	MΩ
Bond all conductors and test between phases and earth.	>200 MΩ	>500 MΩ	MΩ	

#### 5. Very Low Frequency (VLF) Test (to be conducted by HV Lab or Western Power Approved Testing Contractors)

Set the VLF tester to apply the required voltage at a 0.01–1.0 Hz frequency (subject to the length of the cable) for 60 minutes for phases to screen (earth). Record the applied voltage as per Western Power procedures (EDM 21404211). Note: For maintenance of cables the test voltage is to be reduced to 80% for existing cable and to 60% for ageing cable (greater than 30 years of service).	Voltage	Result
	kV	

AC (VLF) Tester—Triplex or Single-Phase (Mixed) XLPE Cables					
Connection		Voltage Peak	Test Duration	Start Leakage (mA)	Finish leakage (mA)
A+B+C	To E		60 min		

#### 6. Insulation Resistance Test (Post-VLF Test)

Conduct an insulation resistance test for 1 to 10 minutes (subject to the length of the cable) or until the reading is stable. After the VLF test, conduct an insulation resistance test using a 5 kV insulation resistance tester between phase to phase and earth. Record the measured values.	Test Connection	Resistor Values		Test Results
		Belted	Screened	
	Red to (white & blue) phase & earth/screen	>200 MΩ	>500 MΩ	MΩ
	White to (red & blue) phase & earth/screen	>200 MΩ	>500 MΩ	MΩ
Blue to (red & white) phase & earth/screen	>200 MΩ	>500 MΩ	MΩ	

**The person responsible for commissioning must sign this document before energisation.**

#### 7. Cable Termination Checks

Ensure all the cable connections and terminations are made and tightened to the required manufacturer standard.	
Ensure all the cables are clearly and correctly labelled.	

#### 8. Handover of Responsibility for the Completion of Items 1-7

I hereby certify that items 1 to 7 have been completed with satisfactory results and transfer control to the network operating authority.			
Testing officer/cable jointer/CPM		NAC	
Signature		Date & Time	

**9. Handover of Responsibility**

The person responsible for commissioning must ensure that all checks have been completed and the test results comply with the minimum standards.

**Note:** Phase out under NOCC switching schedules across the normally open point, if applicable.

I hereby certify that all items have been completed with satisfactory results and transfer control to the network operating authority.

Commissioned by		NAC	
Signature		Date & Time	

1. Ensure the work area is left tidy with no hazards to the public.
2. Hand over responsibility to the operating authority.
3. The completed form must be returned to the project file/work pack.