



# Section 1.

## General

“Information contained within this section shall be read in conjunction with all sections of this Installation Supply Connection Tests & Procedures manual”

**This page is purposely left blank**

## 1.1 Contents

<b>Section 1.</b>	<b>General</b>	<b>Pages</b>	<b>Issue</b>	<b>Date</b>
1.1	Contents	4	8-Jun	2017
1.2	Changes Summary	2	8-Jun	2017
1.3	Definitions	1	3-	Jan 2011
1.4	Administration	1	6-	Jan 2016
1.5	Distribution	1	1-Jul	2006
1.6	Scope	1	3-Jul	2006
1.7	Objectives	1	3-Jul	2006
1.8	Tests	1	3-Jul	2006
1.9	Innovation	1	3-Jul	2006
1.10	Authorisation	1	5-Jan	2016
1.11	Non-Compliant Test Results	1	3-Jul	2006
1.12	Disclaimer	1	4-Jan	2016
1.13	Copyright	1	4-Jan	2016

<b>Section 2.</b>	<b>Testers &amp; Equipment</b>	<b>Pages</b>	<b>Issue</b>	<b>Date</b>
2.1	Contents	2		
2.2	Test Equipment Maintenance	1		
2.3	Testers	3		
2.4	Test Equipment	1		
2.5	Connection Equipment	1		
2.6	Meter Programmers	1		
2.7	Neutral Tags	1		
2.8	Labels	1		

<b>Section 3. Connection Tests</b>		<b>Pages</b>
3.1	Contents	1
3.2	Test for De-Energised	1
3.3	Neutral Integrity Test Point (NITP) - Test	4
3.4	Underground Consumer Mains Test	2
3.5	Polarity Test	2
3.6	Check Test	2
3.7	Neutral & Supply Test	4
3.8	Meter Load Test	1
3.9	Phase Sequence Test	2
<b>Section 4. Connection Procedures</b>		
4.1	Contents	2
4.2	Principles of Testing & Connection of electrical installations	2
4.3	Supply Capacity Controller Device (SCCD) variation	2
<b>New Installations</b>		
4.4	Overhead Supply – Up to 100 Amp	3
4.5	Underground Supply- Supplied from a Pit	3
4.6	Supply Connection Greater than 100amps:- Overhead or Underground	4
4.7	Unmetered Supply Not associated with Multiple Occupancies	3
4.8	Multiple Occupancy	4
4.9	Public Lighting :- With switchboard	3
4.10	Public Lighting :- Without switchboard	3

<b>Section 4</b>	<b>Connection Procedures</b>	<b>Pages</b>
<b>Existing Installations</b>		
4.11	Replacement or Disconnection, Reconnection Overhead Service – Service Cable on Supply	3
4.11A	Replacement or Disconnection and Reconnection Underground Service <100A Single Occupancy–Service cable “On or Off Supply”	2
4.11B	Replacement or Disconnection and Reconnection Underground Service <100A Multiple Occupancy–Service cable “On or Off Supply”	2
4.11C	Replacement or Disconnection and Reconnection Underground Service >100A Single or Multiple Occupancy–Service cable “On or Off Supply”	4
4.12	Replacement Overhead Service – Service Disconnected from Supply	3
4.13	Replacement Overhead Service – Installation Disconnected from Supply; Pole end protection device	6
4.14	Single Occupancy- Meter Alteration and/or Addition – Direct Metering	3
4.14A	Multiple Occupancy: Meter Alteration and/or Additions – Direct Metering - Main or Occupancy Neutral NOT Disturbed	2
4.14B	Multiple Occupancy: Meter Alteration and/or Additions – Direct Metering-- Main or Occupancy Neutral Disturbed	3
4.15	Metering Alteration/Additions – Current Transformer (CT) installation	9
<b>Other Installations</b>		
4.16	Abolishment of Electricity Supply	3
4.17	Network “High Voltage” Injection Procedure	3
4.18	UG Mains Cable Fault – Reconnection of Supply	2

<b>Section 5. Appendices</b>		
5.1	Contents	1
5.2	NST Fault Finding Chart	10
5.3	Unavailable Independent Earth – Multiple Occupancy	1
5.4	Alternative Supplies	1
5.5	Orders in Council	8
5.6	ESV Safety Alerts	1

## 1.2 Changes Summary

Date	Summary of Changes	Section
Jan 2016	Update Administration Section 1:- to reflect changes in committee personnel, Distribution business titles	1.4 1.12 1.13
Jan 2016	Rewrite of Authorisation clause with reference to VESI STRC guidelines	1.10
Jan 2016	Included photo of new model Dewar NST M1120 with digital display	2.3
Jan 2016	Included photo of 50m Haycolec trailing lead	2.4
Jan 2016	Test Procedures - Removed note permitting NST test in lieu of polarity test on single phase installations. i.e polarity test required prior to NST test on all installations	3.5 3.7
Jan 2016	Included additional picture of check test in Test procedures at an UG installation	3.6
Jan 2016	NST test procedure – referenced digital display output where a digital NST is used.	3.7
Jan 2016	Updated diagram of Check Test in UG service connection AND added wording at step 3 re test of consumers mains required only when positive identification of Consumer Mains can't be made	4.5
Jan 2016	Underground Supply -Over 100amps retitled and rewritten "Supply Connections Greater than 100amps:- Overhead and Underground" for both new and existing installations	4.6
Jan 2016	Abolishment Procedure – added the wording at step 12 to re test conductors for de-energised. Also in procedure & pictures	4.16
Jan 2016	Fault finding chart M1110 added to title. Updated the Hints comments in fault finding to reference to Section 1 Clause 1.10 Administration that identifies the requirements of personnel for connection work /fault rectification in lieu of Code of Practice on electrical safety (Green Book)	5.2A
Jan 2016	List of DEWAR digital NST M1120 LCD screen displays and basic information.	5.2B
Jan 2016	Included overview paragraph to the Order in Councils amendments to the Electricity Safety Act 1998 with the Order in council G17 that was the base for the subsequent Orders -extracts of G36 G33 provided	5.5

Date	Summary of Changes (cont)	Section
June 2017	Removed pre 2016 manual version "Summary of Changes" from new manual	1
June 2017	Updated membership and chair of the committee	1.4
June 2017	Underground consumer mains cable fault – Minimum IR test value of 5 Megohm added for reconnected UG mains	3.4
June 2017	Included new step 10 "Remove ancillary equipment fuses..."	4.6
June 2017	Public lighting re titled Public Lighting -With Switchboard Public Lighting -Without Switchboard	4.9 4.10
June 2017	New procedure:--Replacement or Disconnection and Reconnection Underground Service <100A Single Occupancy– Service cable "On or Off Supply"	4.11A
June 2017	New procedure:- Replacement or Disconnection and Reconnection Underground Service <100A Multiple Occupancy– Service cable "On or Off Supply"	4.11B
June 2017	New procedure:- Replacement or Disconnection and Reconnection Underground Service >100A Single or Multiple Occupancy	4.11C
June 2017	Procedure updated with approved personnel identified to undertake the task. Diagrams removed as they only reflected multiple occupancy installations	4.13



## 1.3 Definitions

The definitions contained herein apply to these Installation Supply Connection Tests and Procedures and may vary from definitions contained in other documents.

**Alive** – means energised or subject to hazardous induced or capacitive voltages.

**Approved** - means having appropriate organisation's endorsement in writing for a specified function.

**Authorised** – A person with the technical knowledge or sufficient experience who has been approved or has the delegated authority to act on behalf of an organisation to perform the duty concerned.

**Conductor** – means a wire, cable or form of metal designed for carrying electrical current.

**Consumer Mains** – means those conductors between the point of supply/consumer terminals and the main switchboard.

**Consumer's Terminals** – means the junction at which the consumer mains connects to the Distributor's service cable or supply main conductors.

**Customer** – means the person or body which requires electricity to be made available to an electrical installation on a property, and includes the owner, occupier or tenant as the case may require or a group of bodies acting as one in the provision of electricity to their property.

**CT** – means current transformer

**Competent** – Having the skills, knowledge and attributes a person needs to complete the task.

**De Energised** – means not connected to any source of electrical supply, but not necessarily isolated.

**Distributor** – means a person who holds a Distribution Licence, or who is exempted from holding a licence of the Electricity Industry Act.

- A "Distributor" is also known as the Local Network Service Provider (LNSP).
- A "relevant Distributor" is the Distributor who operates the Network in the area associated with electrical installation.

**Disturbed Neutral-** means a physical break in the incoming and/or outgoing mains neutral conductor or connections, including a direct physical force on the incoming and/or outgoing mains neutral conductor terminals or connections.

**Electrical Installation** – means consumer terminals, their enclosure, and all wiring and equipment downstream and supplied from those terminals, except for the Distributor's network assets and where applicable, the metering assets.

An electrical installation does not include Distributors network assets including:

- Meter equipment within an electrical installation, and servicing and distribution equipment upstream of the consumer terminals.
- Network assets on land occupied by a Distributor that is not used for the consumption of electricity on that land or incidental to that consumption.
- Fuse cartridges for a Service Protection Device and/or Service Disconnection Device.

**FOLCB** – means Fused Overhead Line Connection Box.

**FSD** – means Fused Switch Disconnecter eg a “Krone” box

**HV** – means High Voltage which is a nominal voltage exceeding 1000v AC or exceeding 1500v DC.

**Isolated** – means not connected to any possible sources of electricity supply by means which will prevent unintentional re-energisation of electrical apparatus and which is assessed as a suitable step in the process of making safe for access purposes.

**LEIW** – means Licensed Electrical Installation Worker as issued by Energy Safe Victoria (ESV).

*“Electrician’s” qualifications* - means a holder of an “Electrician’s” licence

*“Inspectors” qualifications* - means a holder of an “Inspector’s” licence

**LV** – means Low voltage which is a nominal voltage exceeding 50v AC/120v DC but not exceeding 1000v AC. or 1500v DC.

**MEN** – means multiple earthed neutral.

**NITP** – means Neutral Integrity Test Point being a point on the installations earth system proven to be connected the installations neutral system in accordance with these procedures.

**Occupancy** – means an electrical installation or part thereof, which is supplied with electricity through a specific meter or meters and for which an individual electricity consumption account is rendered.

**Occupancies Multiple or Multiple Occupancies** – means more than one Occupancy connected to the same electrical installation.

**Private Electric Line** – any electric line that conducts electricity within an electrical installation from the Point of Supply.

**Private Overhead Electric Line (POEL)** – all components. of any private electric line that is constructed as aerial wiring system

**POA** – means the Point Of Attachment at which an overhead aerial service cable is attached to the structure containing the electrical installation.

**POS** – means the Point of Supply at which the electricity Distributors service cable or supply main connects to the consumer terminals.

**REC** – means Registered Electrical Contractor.

**Responsible Officer** – means the officer appointed by the relevant Distributor to be responsible for the administration of these Rules.

Dependent on a Distributor’s structure, there may be multiple Responsible Officers with specific responsibilities, eg, negotiation for supply, provision of substations, specification of points of supply, types of supply, servicing and metering etc.

**Service Cable / Line** – the final span or section of a Distributor’s low voltage aerial or underground network asset that is connected to the consumer terminals.

**Service Equipment** – means equipment owned by the Distributor and used to connect supply to an Electrical Installation.

**SCCD** – means Supply Capacity Control Device – a customer provided circuit breaker requested by the Distributor to limit the installation load on the network.

**SDD** – means Supply Disconnection Device - a supply disconnection and reconnection device as required by Service & Installation Rules.

Note: The most recent version of the SIRs now refers to an ODD (Occupancy Disconnection Device)

**SPD** – means Service Protection Device – a device required by the Electricity Safety Act and Service Protection clause of the Service & Installation Rules.

Note: The most recent version of the SIRs now refers to a SPD as a Supply Protection Device

**Shall** – is to be understood as mandatory.

**Should** – is to be understood as non-mandatory, i.e. advisory or recommended.

**Supply Connection Facility** – means a facility containing consumer terminals, eg, pillar, cubicle, switchboard or CT enclosure.

**Underground Reticulated Distribution (URD)** – is defined as an underground cable network used in areas where no electrical protective device is provided at the origin of the individual service cable.

**Un-metered Supply** – means a supply that is not metered

## 1.4 Administration

These Installation Supply Connection Tests and Procedures are administered by a committee comprising of nominated representatives from Victorian Electricity Distributors, AusNet Services, CitiPower Pty, Jemena Electricity Networks, Powercor Australia Pty Ltd and United Energy.

This committee have accepted the tests and procedures contained in this document following their development by the committee, and endorsement from their respective companies and as such issue the tests and procedures as a Victorian Electricity Supply Industry (VESI) document.

The tests and procedures are reviewed on a regular basis. Revisions and additional tests and procedures may be included in this document from time to time and it is therefore important the user ensures they are utilising the current document.

Members of the VESI Installation Connection Tests and Procedures Committee at this time are: Bill Beirouti (Chairman, CitiPower), Wayne Kelly (United Energy), Peter O'Neill (Jemena), Peter Mobbs (AusNet Services) and Greg Payne (Secretary, Powercor).

## 1.5 Distribution

Revised copies of these tests and procedures are distributed from time to time so it is important the user ensures they are utilising the current document.

Each electricity Distributor's nominated representative serving on the VESI Installation Connection Tests and Procedures Committee is responsible to ensure arrangements are in place within their respective companies to ensure authorised users are aware of the latest documents.

## 1.6 Scope

These tests and procedures are to be used by persons authorised by the above companies for the connection of all customer installations, occupancies, and/or network assets as described in this document.

The tests and procedures:

- apply from the connection point of the installation to the network and/or occupancy to its connection point, and include the service cable supplying the connection point where this is applicable.
- do not apply to the low voltage reticulation electricity network upstream of the service connection to that network.
- are the accepted tests and procedures referred to in the VESI Field Workers Handbook.

## 1.7 Objectives

The objective of these tests and procedures is to ensure the safe connection to the electricity supply networks by proving the correct supply connection to each main switchboard, occupancy switchboard or equipment to be supplied. This objective is achieved by ensuring the supply connection has the correct:

- polarity
- phase sequence;
- connection and continuity of the neutral conductor;
- connection and operation of the metering equipment

## 1.8 Tests

To prove the correct supply connection it is necessary to perform the applicable tests and procedures detailed in this document at the appropriate stages where work is performed, ie:

- Test for de-energised
- Neutral Integrity Test Point (NITP) - Test
- Underground Consumer Mains Test
- Polarity Test
- Check Test
- Neutral & Supply Test (NST)
- Meter Load Test
- Phase Sequence Test

## 1.9 Innovation

Alternate testing equipment and/or tests and procedures are not precluded, provided they are approved by the relevant electricity Distributor and achieve equal or better outcomes.

## 1.10 Authorisation

Persons performing Test & Connection procedures on behalf of a Network Operator are approved when appropriately trained and assessed as competent in the application of the tests and procedures in accordance with the VESI Skills and Training Guideline and the Electricity Safety Act.

## 1.11 Non - Compliant Test Results

Where acceptable results are not attained in accordance with these tests and procedures during their application, the work site shall be maintained in a safe condition in accordance with distributor's procedures and:

- Where the worker has the competency and authorisation to identify and rectify the cause of the deficient test result they shall do so.
- Where the worker does not have the competency and authorisation to identify and rectify the cause of the deficient test result, they shall report the matter to their supervisor and ensure affected persons are advised.

## 1.12 Disclaimer

These Tests & Procedures have been published by CitiPower, Jemena Electricity Networks; Powercor Australia, AusNet Services and United Energy. The document has been compiled using drawings, guidelines and information that comply with the relevant acts and regulations of the State of Victoria at the date of publication.

It is the responsibility of the end user to determine the suitability of material contained herein to the particular application or purpose of which it is used. Electricity supply publications are revised when necessary by the issue of either revised pages or complete new editions. It is important that users of such publications ascertain they are in possession of the latest issue.

CitiPower, Jemena Electricity Networks; Powercor Australia, AusNet Services and United Energy each expressly disclaim any liability, joint or several, to anyone including, without limitation, any end-user of this document, in respect of anything done by them in reliance in whole or in part upon the contents of this document.

## 1.13 Copyright

COPYRIGHT © 2017, CitiPower Pty, Jemena Electricity Networks(Vic) Ltd, Powercor Australia Ltd, AusNet Services and United Energy.

All rights are reserved, although the above Distributors will not object to the reproduction or copying of this document or sections of the document for the purpose of education or training for work on the Victorian Distributors networks.

However, no part of this document may be reproduced or copied for financial gain in any form without first obtaining the expressed written permission of the VESI Installation Connection Tests and Procedures Committee on behalf of CitiPower, Jemena Electricity Networks, Powercor Australia, AusNet Services and United Energy.

Inquiries concerning copyright should be directed to the VESI Installation Connection Tests and Procedures Committee.