

COMMUNICATIONS ALLIANCE LTD



AUSTRALIAN STANDARD

AS/CA S003.1:2010

Requirements for Customer Access Equipment for
connection to a Telecommunications Network —
Part 1: General

**Adopted for
regulatory purposes**

Australian Standard – Requirements for Customer Access Equipment for connection to a Telecommunications Network — Part 1: General

This Standard was issued in draft form for public comment as DR AS/CA S003.1:2009

First published as AS/ACIF S003:1999

Second edition as AS/ACIF S003:2001

Third edition as AS/ACIF S003:2005

Fourth edition as AS/ACIF S003:2006

Fifth edition as AS/ACIF S003:2008

ISBN: 1 74000 394 2

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FOREWORD

General

This Standard was prepared by the Communications Alliance WC20 : **Customer Access Equipment Revision** Working Committee. It is one of a series of Telecommunication Standards developed under the Memorandum of Understanding between the Australian Communications Authority (ACA) and the Australian Communications Industry Forum.

Note: On 1 July 2005 the ACA became the Australian Communications and Media Authority (ACMA) and the Memorandum of Understanding continues in effect as if the reference to the ACA were a reference to ACMA.

This Standard is a revision of the AS/ACIF S003:2005 and AS/ACIF S003:2008 *Customer Access Equipment for connection to a Telecommunications Network* Standards. This Standard is the result of a consensus among representatives on the Communications Alliance Working Committee to produce it as an Australian Standard.

The designation of this Standard has been changed from AS/ACIF to AS/CA to reflect that the Standard has been published by Communications Alliance as an accredited Standards Development Organisation.

The requirements in this Standard are consistent with the aims of s376 of the *Telecommunications Act 1997*. Specifically these aims are—

- (a) protecting the integrity of a telecommunications network or facility;
- (b) protecting the health and safety of persons;
- (c) ensuring access to emergency services; and
- (d) ensuring interoperability with a standard telephone service.

It should be noted that some Customer Equipment (CE) may also need to comply with requirements in other Standards or other Parts of this Standard.

AS/CA S003 consists of the following parts under the general title *Requirements for Customer Access Equipment for connection to a Telecommunications Network*:

- *Part 1: General*
- *Part 2: Analogue and TDM based technologies*
- *Part 3: Packet and cell based technologies*

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Regulatory notice

This document has been made by ACMA as Telecommunications Technical Standard AS/CA S003.1-2010 under s376 of the *Telecommunications Act 1997*.

ACMA is a Commonwealth authority with statutory powers to impose requirements concerning telecommunications Customer Equipment and Customer Cabling.

ACMA requires Australian manufacturers and importers, or their Australian agents, of specified items of Customer Equipment and Customer Cabling to establish compliance with Standards such as this. Items are required to be labelled in accordance with the applicable labelling notices.

Details on current compliance arrangements can be obtained from the ACMA website at <http://www.acma.gov.au> or by contacting ACMA below at:

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Introduction

This introduction for the AS/CA S003.1 **Australian Standard – Requirements for Customer Access Equipment for connection to a Telecommunications Network — Part 1: General** Standard is not an authoritative section of this Standard and is only provided as guidance for the user of the Standard to outline its objectives, and the factors that have been taken into account in its development.

The reader is directed to the clauses of this Standard for the specific requirements and to the Australian Communications and Media Authority (ACMA) for the applicable telecommunications labelling and compliance arrangements.

Note: Further information on the telecommunications labelling and compliance arrangements can be found in *The Telecommunications Labelling (Customer Equipment and Customer Cabling) Notice* (the TLN). The TLN can be obtained from the Australian Communications and Media Authority (ACMA) website at www.acma.gov.au.

The objective of this Standard is to provide the requirements and test methods for customer equipment that provides access (gateway functions) to a Telecommunications Network in order to meet the regulatory arrangements for such equipment in Australia. The objective of Part 1 of this Standard is to provide requirements that are common to all for Customer Access Equipment (CAE).

The objective of this revision is to divide the requirements for CAE into technology specific Parts to facilitate compliance of CAE that use analogue/TDM based technologies, packet/cell based technologies or both.

The principal differences between this edition of AS/CA S003.1 and the 2005 and 2008 editions of AS/ACIF S003 are the following:

- (a) Requirements specific to analogue and/or PCM-based TDM technologies and Packet/cell based technologies have been separated and included in AS/CA S003.2 and AS/CA S003.3. Only general requirements that are common to CAE are included in AS/CA S003.1.
- (b) The exclusion of the noise requirement on ring signals where the local port is not intended to be connected to building cabling, which was missing from the 2008 edition, has been restored.
- (c) The term 'Industry Based Proprietary Terminals' has been replaced by 'System Integral Terminals' and abbreviated as 'SIT'.
- (d) A note has been added to clarify that an Appendix C compliant SIT connection may require dedicated cabling in cases where interference may occur.
- (e) The technology specific transmission performance requirements are now specified in Parts 2 and 3.
- (f) The conference bridge performance requirements have been relocated to the new Appendix E.
- (g) Clarification of the connection method of earthing requirements for functional purposes and the exclusion of the use of a mains power plug for this purpose.

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1 INTERPRETATIVE GUIDELINES

1.1 Categories of requirements

This Standard contains mandatory requirements as well as provisions that are recommendatory only. Mandatory requirements are designated by the words '**shall**' or '**shall not**'. All other provisions are voluntary.

1.2 Compliance statements

Compliance statements, in italics, suggest methodologies for demonstrating CE's compliance with the requirements.

1.3 Definitions, expressions and terms

If there is any conflict between the definitions used in this Standard and the definitions used in the *Telecommunications Act 1997*, the definitions in the Act take precedence.

1.4 Notes

Text denoted as 'Note' is for guidance in interpretation and is shown in smaller size type.

1.5 References

- (a) Applicable editions (or versions) of other documents referred to in this Standard are specified in Section 3: REFERENCES.
- (b) If a document refers to another document, the other document is a sub-referenced document.
- (c) Where the edition (or version) of the sub-referenced document is uniquely identified in the reference document, then that edition (or version) applies.
- (d) Where the edition (or version) of the sub-referenced document is not uniquely identified in the reference document, then the applicable edition (or version) is that which is current at the date the reference document is legislated under the applicable regulatory framework, or for a non-legislated document, the date upon which the document is published by the relevant standards organisation.
- (e) A number in square brackets '[]' refers to a document listed in Section 3: REFERENCES.

1.6 Units and symbols

In this Standard the International System (SI) of units and symbols is used in accordance with Australian Standard AS ISO 1000 [2].

1.7 Parts of Standards

Customer Equipment (CE) scoped by this Standard is to comply with requirements in Part 1 and the applicable technology-specific Part of this Standard.

2 SCOPE

- 2.1 This Standard applies to Customer Equipment (CE) that is—
- (a) designed with multiple ports (local or network) that provides or is intended to provide access (gateway functions) to a Telecommunications Network; and
 - (b) capable of switching, storage, processing, conversion, integration, line isolation/coupling or multiplexing of analogue or digital voice or voice equivalent communication.
- 2.2 CE is not excluded from the scope of this Standard by reason only that it is capable of performing functions additional to those described in this Standard.

3 REFERENCES

	Publication	Title
	ACMA Technical Standard	
[1]	ACA TS 014 - 1997	General Requirements for Customer Equipment Connected to ISDN Primary Rate Access
	Australian Standards	
[2]	AS ISO 1000-1998	The international System of Unit (SI) and its application.
[3]	AS/NZS 3015:2004	Electrical installations - Extra-low voltage d.c. power supplies and service earthing within public telecommunications networks
[4]	AS/NZS 60950.1:2003	Safety of information technology equipment
	AS/ACIF Standards	
[5]	AS/ACIF S002:2005	Analogue interworking and non-interference requirements for Customer Equipment for connection to the Public Switched Telephone Network
[6]	AS/ACIF S004:2008	Voice frequency performance requirements for Customer Equipment.
[7]	AS/ACIF S016:2001	Requirements for Customer Equipment for connection to hierarchical digital interfaces
[8]	AS/ACIF S031:2001	Requirements for ISDN Basic Access Interface
[9]	AS/ACIF S038:2001	Requirements for ISDN Primary Rate Access Interface
[10]	AS/ACIF S043	Requirements for Customer Equipment for connection to a metallic local loop interface of a Telecommunications Network
[11]	AS/ACIF S043.1:2003	Part 1: General
[12]	AS/ACIF S043.2:2008	Part 2: Broadband
[13]	AS/ACIF S043.3:2008	Part 3: DC, low frequency AC and voiceband
	ANSI Standard	
[14]	T1.601:1998	ISDN Basic Access Interface for Use on Metallic Loops for Application at the Network Side of NT, Layer 1 Specification

	Publication	Title
	ITU-T Recommendations	
[16]	G.223 (11/88)	Assumptions for the calculations of noise on hypothetical reference circuits for telephony
[17]	G.704 (10/98)	Synchronous frame structures used at primary and secondary hierarchical levels
[18]	G.711 (11/88)	Pulse code modulation (PCM) of voice frequencies
[19]	G.732 (11/88)	Characteristics of primary PCM Multiplex equipment operating at 2048 kbit/s
[20]	O.9 (03/99)	Measuring arrangements to access the degree of unbalance about earth
[21]	O.41 (10/94)	Psophometer for use on telephone type circuits
[22]	O.71 (11/88)	Impulsive noise measuring equipment for telephone type circuits
	ETSI Standards	
[23]	ES 201 168 V1.2.1 (2000-10)	Speech Processing, Transmission and Quality Aspects (STQ); Transmission characteristics of digital Private Branch eXchanges (PBXs) for interconnection to private networks, to the public switched network or to IP gateways

4 ABBREVIATIONS AND DEFINITIONS

For the purposes of this Standard, the following abbreviations and definitions apply:

4.1 Abbreviations

AC	Alternating Current
ACIF	Australian Communications Industry Forum
ACMA	Australian Communications and Media Authority
AGC	Automatic Gain Control
AS	Australian Standard
CAE	Customer Access Equipment
CAS	Channel Associated Signalling
CE	Customer Equipment
CSH	Call Still Held
CSS	Customer Switching System(s)
DC	Direct Current
DISA	Direct Inwards System Access
DTMF	Dual Tone Multifrequency
FE	Functional Earth
IAD	Integrated Access Device
ISDN	Integrated Services Digital Network
ISO	International Standardization Organization
LCL	Longitudinal Conversion Loss
LCTL	Longitudinal Conversion Transfer Loss
MFC	Multifrequency Code
NU	Number Unobtainable
NZS	New Zealand Standard
PCM	Pulse Code Modulation
PE	Protective Earth
PIN	Personal Identification Number
PSD	Power Spectral Density
PSTN	Public Switched Telephone Network
REN	Ringer Equivalence Number
RVA	Recorded Voice Announcement
SA	Service Alarm
SIT	System Integral Terminal
TBRL	Terminal Balance Return Loss
TCL	Transverse Conversion Loss
TCTL	Transverse Conversion Transfer Loss
TRC	Telecommunications Reference Conductor
VF	Voice Frequency

4.2 Definitions

4.2.1 Answer signal

A signal which is sent in the backward direction to indicate that the called party has answered.

Note: This signal has a supervisory function.

4.2.2 Automatic Guard

A facility within the CE that prevents the seizure of faulty or incompletely released PSTN lines by the CE.

4.2.3 Blocking Signal (Back Busy)

A signal which is sent in the backward direction and causes a busy condition to be applied at the far end of the link.

4.2.4 Building Cabling Environment

Customer cabling contained within a single building.

4.2.5 Carriage Service Provider

Refer to the *Telecommunications Act 1997*.

4.2.6 Carrier

Refer to the *Telecommunications Act 1997*.

4.2.7 Channel Associated Signalling (CAS)

A signalling method in which the signals necessary for the traffic carried by a single channel are transmitted in the channel itself or in a signalling channel permanently dedicated to it.

4.2.8 Clear Back signal

A signal which is sent in the backward direction to indicate that the called party has cleared.

Note: This signal initiates circuit clearing and indicates that the incoming end has released.

4.2.9 Clear Forward signal

A signal which is sent in the forward direction to initiate the release of the connection.

4.2.10 Conference bridge

Equipment that provides a connection for calls involving more than two external lines (Local Ports (off-premises) or Network Ports).

4.2.11 Customer Access Equipment (CAE)

CE with multiple ports (local or network) that provides access (gateway functions) to a Telecommunications Network and is capable of switching, storage, processing, conversion, integration,

line isolation/coupling or multiplexing of analogue or digital voice or voice equivalent communication.

Note: Examples of CAE include, but are not limited to, PABX or Key Systems, line isolators, ISDN terminal adapters, echo cancellers, interactive voice response systems, voice/packet gateway, IAD and voice messaging systems.

4.2.12 Customer Equipment (CE)

Refer to the *Telecommunications Act 1997*.

4.2.13 Customer Switching System (CSS)

See Customer Access Equipment.

4.2.14 Decadic signalling

A system for transmitting address information by a succession of loop-disconnect, or earth referenced E & M, break pulses. The break pulses momentarily interrupt the established direct current in the circuit. The number of pulses transmitted for a digit corresponds to the numerical value of the digit, with 10 pulses being transmitted for the digit 0.

Note: Where 2 Mbit/s Channel Associated Signalling is used, Decadic Signalling is transferred by bit pattern toggling of the 'a' and 'b' bits in Timeslot 16 for the particular channel in use. See Appendix B for further information.

4.2.15 Dialling

In this Standard, the terms 'dials' and 'dialling' refer to the transmission of address information by a telephone-type rotary dial or push-button key pad, and the transmission of the signals to line from such devices or from a storage device.

4.2.16 Digital network interface

A Telecommunications Network connection that accepts digitally encoded signals representing analogue voice transmissions or data transmissions. See also Network Port (Digital).

Note: Examples of digital network interfaces include, but are not limited to DSL, ISDN, 2.048 Mbit/s CAS or CCS, Ethernet, optical and digital wireless.

4.2.17 Direct Inwards System Access (DISA)

A method of providing direct caller access to CAE or private network equipment, after the Telecommunications Network call set up process has been completed. End to end address signalling is typically by use of in-band DTMF signals.

4.2.18 Dual Tone Multifrequency Signalling (DTMF)

A system for transmitting address and other information by superimposing a succession of voice frequency (VF) signals on a line.

Note: Each signal comprises two simultaneously transmitted tones of different frequency. Up to 16 different signals may be transmitted by standard DTMF signalling.

4.2.19 E & M Signalling

A signalling scheme by which DC line signals are transferred in each direction by application of an earth potential to an M lead, and reception of an Earth potential on the E lead. The E & M leads are separate from the voice path with which they are associated

4.2.20 Exchange line

See Network Port.

4.2.21 Extension line

See Local Port (On Premises).

4.2.22 External extension

See Local Port (Off Premises).

4.2.23 Functional Earth (FE)

The earthing point in equipment or in a system which is necessary for a purpose other than safety. A TRC is one form of a Functional Earth.

4.2.24 Hold

In relation to CE using loop-disconnect signalling, CE is considered to be in the Hold state at any time from application of loop until removal of loop provided that no other DC signalling activity is occurring.

4.2.25 Industry Based Proprietary Terminal (IBPT)

See System Integral Terminal.

4.2.26 Integrated Access Device (IAD)

A device that aggregates multiple channels, (voice or voice equivalent, with data), for transport to a telecommunications network via one or more transmission paths.

Note: IADs may use DSL, ATM, optical or other means of connection.

4.2.27 Local Port (Off Premises)

A port on a CAE that is capable of supporting terminating CE over a connecting link outside a building cabling environment; a carrier or carriage service provider may provide part of the link or it may be wholly provided by the customer.

Note 1: A local port may be directly provided by a CAE or indirectly by system integral equipment.

Note 2: Also see Table E1 in Appendix E for international port abbreviations.

4.2.28 Local Port (On Premises)

A port on a CAE that is capable of supporting terminating CE over a connecting link within a building-cabling environment.

Note 1: A local port may be directly provided by a CAE or indirectly by system integral equipment.

Note 2: Also see Table E1 in Appendix E for international port abbreviations.

4.2.29 Network Port

A port on a CAE that is capable of connection to a Telecommunications Network Service.

Note: Also see Table E1 in Appendix E for international port abbreviations.

4.2.30 Network Port (Digital)

A Network port where the voiceband information is presented as a digitally encoded bitstream. The physical realisation of a Network Port (Digital) can be DSL, ISDN, Ethernet, Wireless, Optical, but is not restricted to these.

4.2.31 Network Port (Four wire E&M)

A Network Port for connection to a PSTN or CE that presents a 6-wire analogue interface. Four wires are used for the voice path. Two wires are used as separate E & M signalling leads.

4.2.32 Network Port (Indial)

A Network Port with the ability to accept address signals from the PSTN/ISDN.

4.2.33 Network Port (Loop-in)

A unidirectional call set-up port (set-up from the PSTN to a CAE) that is seized by application of a DC loop at the PSTN exchange.

4.2.34 Network Port (Ring-in/Loop-out)

A bothway call set-up port. Incoming signalling to CE is by application of a ring signal at the PSTN exchange. Outgoing signalling from CE is by application of a DC loop at the CE.

4.2.35 Point of zero relative level (0 dBr point)

A particular place within a transmission path chosen for reference and calculation purposes (also called the '0 dBr point'). ITU-T Recommendation G.223 [16] defines a 0 dBr point as a point where the long term average speech level per subscriber in an individual VF channel is -15 dBm.

4.2.36 Port

An interface to equipment for the purpose of supplying an output signal and/or accepting an input signal.

- 4.2.37 Protective Earth (PE)
A connection to the Protective Earthing Conductor. Refer to AS/NZS 60950.1 [4].
- 4.2.38 Public Switched Telephone Network (PSTN)
That part of the Telecommunications Network which enables any customer to establish a connection for voice frequency communication with any other customer either automatically or with operator assistance.

Note: The PSTN has a nominal transmission bandwidth of 3 kHz.
- 4.2.39 Recall Backward
A signal which is sent in the backward direction after answer.

Note: This signal can only be used with the agreement of the parties providing the equipment at both ends of the circuit.
- 4.2.40 Recall Forward
A signal which is sent in the forward direction after the completion of information signalling.

Note: This signal can only be used with the agreement of the parties providing the equipment at both ends of the circuit.
- 4.2.41 Release Guard
A signal which is sent in the backward direction in response to the clear forward signal, and indicates that release of the equipment is in progress at the far end.
- 4.2.42 Reversal on Seizure
Reversal on Seizure is a facility available to some PSTN Network Ports that indicates the PSTN line state. It consists of a polarity reversal applied—

(a) in response to an applied loop for outgoing calls; and
(b) immediately prior to application of Ring for an incoming call.
- 4.2.43 Reversal On Answer
Reversal On Answer is a facility available to some PSTN Network Ports that indicates the B-Party state. It consists of a polarity reversal applied by the PSTN exchange to the A party line when the B-Party answers.
- 4.2.44 Ringer Equivalence Number (REN)
An approximate value of loading presented to the line during ringing state, and is based on the capacitance of a network port in the idle state. 1 REN is defined as 1 μ F in series with a 4 k Ω resistor.

- 4.2.45 **Seize Acknowledge signal (Proceed to Send)**
A signal which is sent in the backward direction following the receipt of a seize signal and indicates that the equipment is ready to receive information signals.

Note: The signal can only be used with the agreement of the parties providing the equipment at both ends of the circuit.
- 4.2.46 **Seize signal**
A signal which is sent in the forward direction at the beginning of a call and prepares the equipment at the far end of the circuit to accept subsequent information and supervisory signals.
- 4.2.47 **Standard telephone instrument**
CE, or part thereof, for analogue two-wire voice communication to which the requirements of AS/ACIF S002 [5] and AS/ACIF S004 [6] apply where both initiation and termination of the call is under user control.

Note: Address signalling is provided by either loop-disconnect decadic signalling or by dual-tone multifrequency (DTMF) signalling, under direct user control or by user initiation of stored numbers.
- 4.2.48 **System Integral Terminal**
Analogue or digital connected terminal, which is intended to operate in association with a CAE and functions as part of the CAE via a local port, for the purpose of voice telephony with the Telecommunications Network and may include both wired and wireless interfaces using proprietary or standards based signalling.

The system integral telephony terminal (wired or wireless) is not intended for direct connection to a public network. Previously referred to as Industry Based Proprietary Terminal (IBPT)

Note: Also see Table E1 in Appendix E for international port abbreviations.
- 4.2.49 **Telecommunications Network**
Refer to Section 374(1) of the *Telecommunications Act 1997*.
- 4.2.50 **Telecommunications Reference Conductor (TRC)**
A low noise earthing conductor, providing a zero voltage reference point for signalling and other functional purposes including, but not limited to, equipment reliability.

Note: Integral surge suppression devices within Customer Equipment may be connected to the TRC.
- 4.2.51 **Tie Line Port**
A Network Port for the interconnection of CAE.

Note: Also see Table E1 in Appendix E for international port abbreviations.

4.2.52 Voice Frequency (VF)

Those frequencies in the range of 300 Hz to 3.4 kHz.

4.2.53 Voiceband

Voiceband is a general term that may include frequencies from 200 Hz to 4.0 kHz.

5 REQUIREMENTS

5.1 General

5.1.1 Power failure

In the event of power failure, such as caused by mains failure or discharge of back-up batteries, then the following apply:

- (a) For PSTN Network Ports (Ring-in/Loop-out)—
 - (i) the CE **shall not** seize the line to cause blocking; and
 - (ii) if a line is transferred to a Standard Telephone Instrument, on restoration of power, the CE should not release any connection established during the power fail period.
- (b) For PSTN Network Ports (Loop in) the battery feed **shall** be removed so that incoming traffic is not offered to the CE.
- (c) For PSTN Network Ports (Four wire E&M) the CE **shall not** seize the line to cause blocking.

Note: The PSTN will not be able to offer traffic to the CE as the M lead Wink will not be returned by the CE.

Compliance with Clause 5.1.1 should be checked by inspection or operation as appropriate.

5.1.2 Network Port calls

An incoming call from the telecommunication network (including those switched via a private network) **shall** only be lost if—

- (a) the call is unanswered and then abandoned by the calling party;
- (b) the call is forcibly released by the operation of a key at the operator's position; or
- (c) the call is force released by the PSTN or ISDN.

Compliance with Clause 5.1.2 should be checked by inspection or operation as appropriate.

5.1.3 Functional Earth connection and Protective Earth connection

5.1.3.1 Form of Functional earth

If Customer Equipment has an earth dependent DC signalling component or a requirement for a low noise earth then a FE should take the form of either—

- (a) a TRC; or
- (b) an ELV DC power source that complies with AS/NZS 3015 [3]; or

- (c) a DC positive return circuit which obtains a connection to earth through a common power supply earthing point.

5.1.3.2 Functional earth requirements

The following requirements apply for the connection of CE to the FE.

- (a) Where CE has PSTN Network Ports (Loop-in), the positive pole of the power supply providing the battery feed potential for loop-in PSTN lines **shall** be connected to the FE.

Note: Loop-in PSTN line is described in AS/ACIF S002 [5].

- (b) Where CE has E & M signalling capability, the positive pole of the power supply providing the signalling source **shall** be connected to the FE.

Note: E & M signalling is described in Clause 5.6 and Appendix A.

Compliance with Clause 5.1.3.2 should be checked by inspection.

5.1.3.3 Local Port Functional earth

For Local Port (Off Premises) as described in Clause 5.3, the CE should have the FE connected to the positive pole of the power supply providing the battery feed potential.

Note: This is to minimise noise and facilitate carrier or carriage service provider operations and maintenance activities.

5.1.3.4 Functional Earth connection

Where CE requires an earth connection for functional purposes and the CE incorporates a mix of port types (e.g. local, network, data, etc) connection to the external functional earthing system—

- (a) **shall** be by a designated screw terminal or equivalent method; and
- (b) **shall not** rely on the use of a pluggable mains protective earth for this purpose.

5.1.3.5 Linking to Protective earth

Where a hard-wired PE is connected to the CE, the optional linking of PE and FE terminals within the CE is allowed. The following requirements apply:

- (a) Where the linking of PE and FE terminals is factory fitted or intended to be performed by installation personnel, the installation manual/instructions or other supporting documentation **shall** indicate—
 - (i) the methods by which installation personnel are to install and/or remove the link;
 - (ii) the methods by which installation personnel are to connect the PE and/or FE to the CE;

- (iii) that a FE conductor cannot be connected if the link is installed between PE and FE terminals within the CE; and
 - (iv) that the link between PE and FE terminals must not be installed within the CE if a FE conductor is connected.
- (b) Where an intrinsic bond exists between PE and FE within the CE, the installation manual/instructions or other supporting documentation **shall** indicate—
- (i) the methods by which installation personnel are to connect the PE to the CE; and
 - (ii) that a FE conductor must not be connected to the CE.

Compliance with Clause 5.1.3.5 should be checked by inspection of the relevant installation documentation.

5.1.3.6 Protective earth isolation link

The requirements of AS/NZS 60950.1 [4] are to apply to the isolation between the FE and PE terminals within a CE with any links as described in Clause 5.1.3.5 removed.

Compliance with Clause 5.1.3.6 should be checked in accordance with the requirements of AS/NZS 60950.1 [4].

5.1.4 Emergency services access

5.1.4.1 Support of emergency services access numbers.

When each of the following emergency services access numbers is dialled, all CE **shall** provide a full duplex speech path within 1 s of the last digit being forwarded to a Telecommunications Network:

- (a) 000 (three digits).
- (b) 106 (three digits).

Note: Where a private network is used to provide access to an emergency service, the private network operator should ensure that the accessed network port (and hence the CLI that is passed to an emergency service organisation in conjunction with other location information is used to determine the location of the emergency caller) is placed as close as possible to the user of the private network port.

5.1.4.2 Access barring of emergency service numbers.

CE should not support access barring of emergency service numbers.

5.1.4.3 Support following the loss of mains power

Mains-powered CE should continue to support the dialling of emergency service numbers for at least 30 minutes following the loss of mains power.

Note: CE that does not continue to support emergency dialling after loss of mains power, should include in the accompanying documentation a warning notice. A suggested wording for such a warning notice is as follows:

Warning

This equipment will be inoperable when mains power fails

Compliance with Clause 5.1.4 should be checked by inspection.

5.1.5 Security of dialled information

To assist in safeguarding the security of dialled information stored or processed within a CE or output to any subsequent call detail processing system, CE which incorporates the facility for recording or outputting of digits dialled on outgoing Public Network calls should provide the capability to truncate the digit information. Where a truncation capability is provided, the extent of truncation should be configurable within a CE.

Note 1: The following is a possible example of achieving this:

- (a) All Local Telecommunications Network codes – not more than six leading digits to be available.
- (b) All National Telecommunications Network codes – not more than eight leading digits to be available.
- (c) All International Telecommunications Network codes – not more than sixteen leading digits to be available.

Note 2: Local telecommunications network codes may be determined from the ACMA numbering plan.

Note 3: 'Leading' digits exclude the Telecommunications Network exchange access codes used by the CE, e.g. '0'.

5.1.6 Security of incoming automatically answered calls

Where a CE provides for DISA facility and it is used to access other Network Ports and/or private network features, it is strongly recommended that an authorisation procedure be invoked (e.g. Personal Identification Number (PIN) with a suitable number of digits) to enable access.

The CE user documentation should include information warning that the DISA facility could be subject to fraudulent use if adequate security measures are not in place.

Compliance with Clause 5.1.6 should be checked by inspection.

5.1.7 Indial requirements for CE

The following requirements apply to CE with PSTN or ISDN indial capability, or both:

- (a) PSTN Network Port (Indial)

For CE that has a PSTN indial capability, the requirements of AS/ACIF S002 [5] apply for both loop-in PSTN interface and 2048 kbit/s interface - CAS protocol.

(b) ISDN Network Port (Indial)

For CE that has an ISDN indial capability, the following Call Control requirements apply, as detailed in AS/ACIF S031 [8] or AS/ACIF S038 [9], as appropriate to the interface type used.

- (i) If the addressed user is classified as denied, unallotted or unequipped, the CE **shall** return Cause Code 1 (Unallocated /Unassigned Number) as part of a clearing message where the call is not diverted to an operator or a RVA.
- (ii) If the addressed user is diverted to an operator or RVA, any through connection of the speech path **shall** be preceded by a Connect message.
- (iii) If the addressed user is free, for a 3.1 kHz Audio Bearer Service or Speech call, the CE **shall**—
 - (A) return an Alerting message; or
 - (B) return a Progress message, if the Telecommunications Network supports the option to through switch the transmission path prior to call acceptance.

Note 1: An Alerting message will enable the Telecommunications Network to apply Ring Tone to the caller where applicable.

Note 2: A CE should not return a clearing message after this Alerting Message unless it is either preceded by a clearing message from the Telecommunications Network or as a consequence of error procedures detailed in ACA Technical Standard 014 [1] and AS/ACIF S031 [8] and AS/ACIF S038 [9].

- (iv) If the addressed user is busy, the CE **shall** return Cause Code 17 (User Busy) as part of a clearing message where the call is not diverted to an operator or RVA.

Compliance with Clause 5.1.7 should be checked by operation.

5.2 Network Ports (Ring-in/Loop-out)

5.2.1 General

5.2.1.1 Network Port requirements

Clause 5.2 specifies the requirements for analogue two-wire Network Ports (Ring in/Loop-out). The requirements for Network Ports (Four wire E&M) are specified in Appendix A. The requirements for two-wire Network Ports (Loop-in - Indial) are specified in AS/ACIF S002 [5].

5.2.1.2 S002 requirements

The CE is to comply with the analogue interworking and non-interference requirements of AS/ACIF S002 [5] unless stated otherwise in this Standard.

5.2.1.3 Idle state blocking

While the Network Port is in the idle state, an incoming call **shall not** be blocked.

Compliance with Clause 5.2.1.3 should be checked by operation.

5.2.2 Common requirements

The following requirements apply to each Network Port (Ring-in/Loop-out) of the CE.

5.2.2.1 Line polarity

The operation of the Network Port **shall** be independent of line conductor polarity except where polarity dependent line signals need to be detected. If the CE is polarity dependent because it needs to detect line signals (those associated with incoming and outgoing calls), then the CE should incorporate long term polarity independence while still being able to detect the short term signals present during calls.

Note 1: The polarity of a line may not be guaranteed by carriers or carriage service providers.

Note 2: Polarity dependent line signals include reversal-on-seizure and reversal on answer signals.

Compliance with Clause 5.2.2.1 should be checked by application of polarity reversals.

5.2.2.2 Release blocking

The Network Port **shall** be blocked to further outgoing calls for not less than 800 ms after the release of an outgoing call.

Compliance with Clause 5.2.2.2 should be checked by using the test set up as indicated in Clause 6.6.2.

5.2.2.3 Idle resistance

The following requirements are applicable to the CE in the off-line state:

- (a) The insulation resistance **shall not** be less than 1 M Ω between—
 - (i) the two line conductors;
 - (ii) each line conductor and FE terminal if equipped; and
 - (iii) each line conductor and PE terminal, if equipped