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Mr Michael Cosgrave
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Dear Mr Cosgrave

Line Sharing Service – 152BT Request – Service Description

I refer to the Commission's facsimile of 3 June 2004, attaching the complete section 152BT request of 30 April 2004, and attach Telstra's response to that request.

Yours sincerely

Paul Paterson
Director, Regulatory

FILE No.
ENTITY D04/27137
DMAN

Further Information Requested by the ACCC Regarding Telstra's Spectrum Sharing Undertaking

Telstra lodged an ordinary access undertaking ("Undertaking") dated 1 September 2003 with the Commission in respect of the High Frequency Local Loop Service as declared (otherwise known as Spectrum Sharing or Line Sharing) ("Declared Service"). Pursuant to section 152BT of the *Trade Practices Act 1974* (Cth) ("TPA"), the Commission made two requests for information from Telstra in relation to the Undertaking. Telstra responded to these requests on 30 September and 15 October 2003. On 30 April 2004, the Commission subsequently requested further information from Telstra. Telstra provides the following information in response to that further request.

If the Commission has any further questions regarding the Undertaking, Telstra would be happy to meet with the Commission to discuss these.

Question 1

Does the Undertaking only apply in respect of the Service when it is used to supply ADSL services in accordance with Deployment Class 6 (excluding 6c) of the Network Deployment Rules?

Paragraph 4.2 of Attachment A to the Undertaking obliges access seekers to comply with Deployment Class 6 (excluding 6c) of the Network Deployment Rule:¹ ("Deployment Class 6"). Paragraph 4.4 of Attachment A to the Undertaking provides that:

The Access Seeker may only use the Telstra Wholesale Spectrum Sharing Service to operate an ADSL service in accordance with Deployment Class 6 (excluding 6c) of the Network Deployment Rules.

These are the terms and conditions on which Telstra proposes to comply with its standard access obligations ("SAOs") with regard to the Service. Telstra submits that these terms and conditions are reasonable given that the deployment classes are set out in Australian Communications Industry Forum ("ACIF") Industry Code C559 which has been agreed by industry and registered with the Australian Communications Authority ("ACA").²

¹ Australian Communications Industry Forum, *Unconditioned Local Loop Service (ULLS) Network Deployment Rules*, C559: August 2001 ("C559").

² *Ibid.*

Question 2

Would the Undertaking apply in respect of the Service when it is used to supply ADSL in a manner other than in accordance with Deployment Class 6?

It is not clear to Telstra what the Commission means by this question. However, if the Commission is inquiring as to whether Telstra's SAOs would require it to supply the Declared Service other than in accordance with Deployment Class 6 if the Undertaking is accepted, Telstra submits that they would not.

Question 3

Would the Undertaking apply in respect of the Service when it is used to supply other xDSL services?

As set out in Telstra's response to Question 1 above, the Undertaking provides that the Telstra Wholesale Spectrum Sharing Service may only be used to supply ADSL services. This is a term and condition on which Telstra proposes to comply with its SAOs with regard to the Declared Service. Telstra submits that this term and condition is reasonable because the only xDSL service that Telstra supplies to itself over a PSTN line is ADSL. Furthermore, under C559 only Deployment Class 6 is compatible with the provision of voice services. Given that the service description for the Declared Service requires that an "underlying voiceband PSTN service is operating", only Deployment Class 6 will apply. Since Deployment Class 6 applies to ADSL services only, Telstra has sought to ensure the Declared Service may only be used to supply ADSL in order to comply with C559.

Question 4

Would the Undertaking have any relevance or application in respect to access for the purposes of supplying a form of service that falls within the parameters set out under the declared service but falls outside the parameters and description of the Telstra service?

Telstra undertakes to provide the Telstra Wholesale Spectrum Sharing Service specified in the Undertaking on the terms and conditions set out in the Undertaking in relation to the SAOs applicable to Telstra in respect of the Declared Service. Telstra submits that those terms and conditions are reasonable having regard to the need for a clear and certain understanding between the access provider and access seekers as to the service to be provided and acquired.

Furthermore, and as set out above, the Declared Service may only be supplied in accordance with Deployment Class 6.

Question 5

Does Telstra consider that the Undertaking will satisfy Telstra's standard access obligations in respect of only the Telstra service?

Telstra submits that the Undertaking will satisfy its SAOs in respect of the Declared Service.

Question 6

Does Telstra consider the Undertaking will satisfy Telstra's standard access obligations in respect of the declared line sharing service?

As set out above, Telstra submits that the Undertaking will satisfy its SAOs in respect of the Declared Service.

Question 7

Does Telstra consider that the Undertaking, if accepted by the Commission will preclude arbitration of spectrum sharing service disputes other than when the Service is used to supply an ADSL service in accordance with Deployment Class 6 (excluding 6c) of the Network Deployment Rules? For example, if the Service was used to supply ADSL services in a manner other than that in accordance with Deployment Class 6 or to supply other xDSL services, does Telstra consider that the Commission would be able to arbitrate disputes and make a determination on access in relation to such supply?

If the Undertaking is accepted by the Commission, the Commission will be unable to make arbitral determinations in relation to the Declared Service which are inconsistent with the Undertaking. For example, the Commission could not make a determination requiring Telstra to supply the Declared Service in accordance with Deployment Class 9 or Deployment Class 3. Nor could the Commission require Telstra to provide a service where the access seeker refused to comply with paragraph 4.4 of Attachment A to the Undertaking.

Question 8

Can the declared spectrum sharing service be used to supply xDSL services other than ADSL, such as SHDSL, SDSL, HDSL or VDSL?

The Declared Service cannot currently be used to supply xDSL services other than ADSL. There is another technology, VDSL, which has the potential to operate over the non-voice band of the spectrum. This technology is being considered by a working group at the ACIF for inclusion in the Network Deployment Rules. However no decision has been made on this yet. Accordingly, given that the Undertaking term expires on 31 December 2004, Telstra submits that the terms and conditions limiting supply of the Service to ADSL are reasonable, having regard to C559 and the fact that only Deployment Class 6 applies to the supply of the Declared Service (paragraph 152AH(e) of the TPA).

Furthermore Optus has previously noted that some DSL technologies such SDSL or HDSL require the use of the full spectrum or more than one ULLS and therefore will not benefit from spectrum sharing.³

Finally it is possible for an access seeker to provide an ADSL service in a symmetrical manner to its end customers (eg 512K in each direction).

Question 9

Telstra defines "SSS Boundary" to include, where there is an MDF in the customer building, "a two wire point on the side of the frame nearest to the Telstra network". The Telecommunications Act 1997 (TA), however, provides for a boundary point on an MDF on "the side of the frame nearest to the end user". Does Telstra consider its definition of SSS Boundary is more limited than the definition in the TA? Why has Telstra described the SSS Boundary in this way?

Telstra concedes that the definition of "SSS Boundary"⁴ in the Undertaking is not identical to the definition of telecommunications network boundary in section 22 of the *Telecommunications Act*

³ Cable & Wireless Optus as cited in Australian Competition and Consumer Commission, "Line Sharing Service: Final Decision on whether or not a Line Sharing Service should be declared under Part XIC of the *Trade Practices Act 1974*" at 17.

⁴ SSS Boundary means in relation to a line that enters a building on the SSS End Customer premises (a) if there is an MDF in the building and the line is connected to the MDF - a two wire point on the side of the frame nearest to the Telstra network.

1997 (Cth). However, Telstra is unsure what the Commission means by "limited". The reasons for the difference are:

- (a) Telstra is frequently unable to determine the appropriate "tag" on the customer side of the MDF to which the line should be jumpered given that the records in the MDF are frequently inaccurate or missing; and
- (b) A central line filter, which is not supplied by Telstra, is often located on the side of the MDF nearest the end customer.

Telstra therefore submits that this term and condition is reasonable because of the need for safe and reliable operation of the spectrum sharing service (paragraph 152AH(e) of the TPA).

Question 10

Does Telstra have a list of splitters it considers comply with the "Telstra Splitter Specifications" (both exchange-end splitters and customer premises end splitters)? If so, Telstra should provide these details. Telstra should also confirm that any of these splitters could be used by access seekers acquiring the Service.

As set out in the definition of Telstra Splitter Specification in Attachment A of the Undertaking, the access seeker's splitters must comply with the Telstra Splitter Specification for ADSL/POTS Spectrum Sharing Technical Reference RCIT.0004 ("Telstra Splitter Specification") as provided at www.telstra.com.au/adsl/equipment.htm. That website specifies a list of customer premises end splitters which comply with the Telstra Splitter Specification, namely:

- ADC/Covertel - Distributed Splitter, RJ11/45 - 3 port, IPC-EXAUS-01
- C10 Communications - Distributed Splitter, 600 series, C10645E
- C10 Communications - Distributed Splitter, RJ11/45 series, C10245E
- C10 Communications - Distributed Splitter, Wall Mount, C10345E
- C10 Communications - Remote Splitter, C10100E

Exchange end splitters form part of the DSLAM equipment and are usually provided by DSLAM vendors such as Alcatel and NEC due to the need for technical compatibility. Therefore Telstra does not have a list of such splitters. However both Alcatel and NEC presently supply Telstra with DSLAMs and Telstra is not aware of any difficulties in sourcing these from either vendor.

For ease of reference, the Telstra Splitter Specification is provided at Annexure A to this response.

Question 11

In its definition of "TCAM", Telstra does not expressly include a "customer line module of a customer access module", even though this definition is included in the Declaration. Does Telstra intend to exclude customer line modules of a customer access module from Telstra's service and, if so, why?

A Telstra Customer Access Module ("TCAM") is defined in Attachment A to the Undertaking as "a device owned by Telstra that provides dial tone, ring current and battery feed to customer equipment". RSSs, RIMs, ASVs and IRIMs are merely expressed to be examples of such equipment. Furthermore, the Commission's services description does not refer to a "customer line module of a customer access module" but "a customer line module of a local switch".

Question 12

Under the Network Modernisation provisions in the Undertaking, why has Telstra not provided access seekers with a notice period in which it would advise of any such changes?

The purpose of the network modernisation provisions in the Undertaking is to ensure that access seekers are informed that Telstra may need to make changes to the network prior to those access seekers acquiring the Service. The provisions are not intended to set out the procedures that will be followed in the event that Telstra does update the network. These procedures are generally dealt with in the access agreements Telstra has with access seekers. For example, the General Terms and Conditions of Telstra's General Access Agreement or "GAA" (which do not form a part of the Undertaking) contain specific provisions regarding variations to services. These provisions include typical notice periods for different types of variations.

Question 13

Does Telstra intend the Undertaking to preclude the use of the ADSL spectrum for voice services (such as VOIP)?

Telstra does not intend to preclude the use of the non-voiceband frequency for any particular purpose. In requiring the Service to be used for ADSL only, Telstra is merely seeking to reflect the requirements of the Network Deployment Rules which are binding on the industry. This is discussed in Telstra's response to question 3 above.

Question 14

What clause is clause 2.4(c) intended to refer to in Attachment A of the Undertaking? (It currently refers to "arrangements agreed under (c)", which appears to be a reference to itself.)

The reference to "arrangements agreed under (c)" in clause 2.4 of Attachment A to the Undertaking is intended to refer to Option 3 - SSS Boundary (c).

Question 15

Are notices proposed to be given by Telstra to the ACCC under clauses 4.1 and 4.2 of the Undertaking intended to constitute notices given to the ACCC under section 152BY and 152CB of the Trade Practices Act 1974, therefore providing the Commission with the discretion to accept or reject proposed variations and replacement undertakings?

Telstra submits that notices given to the Commission under clauses 4.1 and 4.2 of the Undertaking would constitute notices to the Commission under sections 152BY and 152CB of the TPA.

Other issues

The Commission has also identified a number of differences between the Telstra service and the declared line sharing service as detailed in the Declaration. The Commission invites Telstra to comment on any or all of these differences.

Telstra service description	Commission's LSS description	Comments
"non voice"	"non-voiceband"	Telstra submits that the difference is not material and does not give rise to any ambiguity.
"continuous metallic twisted pair"	"unconditioned communications wire"	Telstra submits that the reference to "continuous metallic twisted pair" reflects the way in which Telstra delivers the Service and is therefore more certain. In any case, "communications wire" is defined in the Commission's LSS description as a "copper or aluminium wire", which Telstra submits is consistent with the use of "metallic" in the Undertaking.
"active PSTS voice service"	"underlying voiceband PSTN service"	Telstra submits that the difference is not material and does not give rise to any ambiguity.

<p>"PSTS"</p>	<p>"PSTN service"</p>	<p>Telstra submits that the difference is not material and does not give rise to any ambiguity. A public switched telephone service ("PSTS") is a service provided over the PSTN so is therefore equivalent to a PSTN service. Telstra has adopted this terminology for consistency with its standard form of agreement which sets out the services provided by Telstra over the PSTN.</p>
<p>"agreed" point of interconnection</p>	<p>"potential" point of interconnection</p>	<p>Whilst the Commission's LSS description highlights potential sites where interconnection occurs, it does not specify where and how this will occur. Telstra submits that the use of "agreed" reflects standard industry practice whereby POIs are agreed between the parties based on the available sites.</p>

ANNEXURE A
TELSTRA SPLITTER SPECIFICATION FOR ADSL/POTS
SPECTRUM SHARING

TELSTRA IN CONFIDENCE



Hosting and Internet
Protocols and Signalling

Technical Reference
RCIT.0004

**Splitter Specification for ADSL/POTS
Spectrum Sharing**
DRAFT

Implementation:

Uncontrolled Document - No Unauthorised Copying

Telstra Corporation Limited
ACN 051 775 556 ABN 33 775 556

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1. PURPOSE

The purpose of this Technical Reference is to provide the technical requirements for Splitters located at both exchange and customer premises ends of a loop with spectrum sharing between ADSL and POTS.

2. SCOPE

Splitters for both exchange and customer premises ends of a loop with spectrum sharing between ADSL and POTS must be provided by the ADSL Acquirer as part of the overlaid ADSL service. The following specifications must be met by those splitters. For exchange splitters and Customer Premises (Remote) splitters this Technical Reference uses the requirements stipulated within the ETSI Technical Report and Technical Specification for low pass filters with certain alterations, limitations and additions to suit Australian conditions. This is considered necessary to allow satisfactory operation of voiceband CPE currently in use.

This Technical Reference does not contain Customer Premises splitter usage information, this is contained in Technical Reference RCIT.0006, Customer End Splitter Information for ADSL/POTS Spectrum Sharing

3. PRODUCT DESCRIPTION

The Telstra Wholesale Spectrum Sharing Service (SSS) product allows an Acquirer to use vacant frequency spectrum, at frequencies above an existing voiceband PSTN service provided by Telstra. Spectrum Sharing will be provided on an unconditioned communications pair between the boundary of a telecommunications network at an end-user's premises and a point on a telecommunications network that is a potential point of interconnection located at, or associated with, an Acquirer's customer access module (CAM) and located on the end-user side of the customer access module.

Spectrum Sharing will be provided over a single existing twisted metallic pair. Acquirers will need to provide their own DSLAMs, compliant ADSL modems and compliant filters that are suitable for connection to the Telstra network. Acquires will also be required to install a Network Termination Device (NTD) at the end-customer premises when applicable. Spectrum Sharing will be available nationally subject to the Acquirer having rolled out their equipment.

TELSTRA IN CONFIDENCE

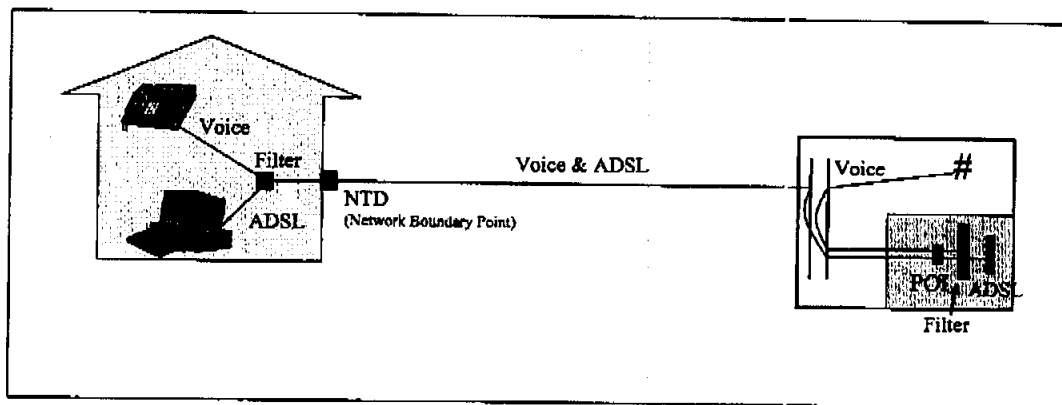


Figure 1: Telstra Wholesale Spectrum Sharing Service (end-to-end view)

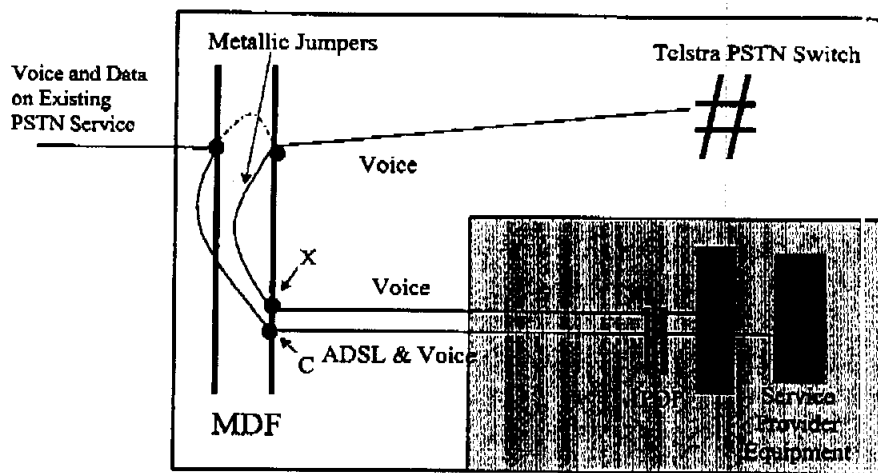


Figure2: Telstra Wholesale Spectrum Sharing Service (Voice provided by Telstra, ADSL provided by Acquirer)

4. PERFORMANCE OBJECTIVES

4.1. GENERAL

ETSI has published the final Technical Specification (TS) ETSI TS 101 952-1-1 V1.1.1 (2002-05) : "Specification of the low pass part of ADSL/POTS splitters". This document is part I, sub-part 1 of a series of documents covering access network xDSL transmission filters. The other document of interest is Sub-part 5: "Specification for ADSL/POTS distributed splitters", this has not been published yet. Therefore ETSI TR 101.728 V1.2.1 (2002-05) must still be used as sub-part 1 does not cover distributed splitters. Note ETSI TR 101.728 V1.2.1 (2002-05) is only called up in section 4.3, the customer splitter section of RCIT 0004.

4.2. EXCHANGE SPLITTER

The exchange end splitter must be provided by the Acquirer in its space, and is cabled from the telephony port back to the MDF to enable further jumpering to the telephone switch.

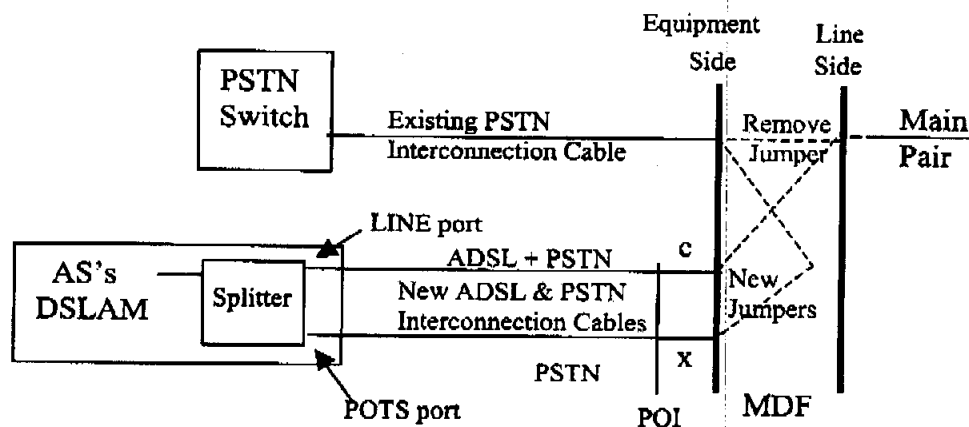


Fig. 3. Splitter in Acquirer's equipment.

The splitter provides a low pass filtering functionality in the telephony path, to effectively decouple the ADSL and telephony services.

The low pass filtering at the exchange end must meet the requirements of ETSI TS 101 952-1-1 V1.1.1 (2002-05), with the exclusions, explanations and changes listed below. These changes have been made for the Australian telecommunications environment.

Note, all tests in ETSI TS 101 952-1-1 V1.1.1 (2002-05) must be performed at both line polarities and at both maximum and minimum line current. ie all tests in ETSI TS 101 952-1-1 V1.1.1 (2002-05) must be repeated at four line conditions.

4.2.1. ETSI SPECIFICATION CHANGES AND CLARIFICATIONS FOR EXCHANGE SPLITTER.

4.2.1.1. Testing Conditions (Section 5 of ETSI TS 101.952-1-1)

4.2.1.1.1 Feed currents

For clause 5.1.2, feed currents up to 125 mA DC may be encountered in Australia. During the transition from the Ringing to the Offhook state, large transient currents in excess of 200mA may occur. However the requirements for testing remain as in clause 5.1.2.

4.2.1.1.2 Impedances

The ETSI specifications of return loss, etc are based on the European harmonized impedance Z_R . Note that the European harmonized impedance Z_R is a close match to the Australian TN12 complex impedance. Hence either impedance can be used as a reference impedance for testing. For example if the splitter passes with Z_R , then there is no need to test with TN12 (and vice versa). If a result fails marginally with Z_R then TN12 can be used as it may pass with this slightly different impedance TN12 (and vice versa).

4.2.1.2. Splitter Requirements (Section 6 of ETSI TS 101.952-1-1)

4.2.1.2.1 Option A splitters are required

4.2.1.2.2 DC insulation resistance between terminals and earth

In Clause 6.2.1 the DC resistance between terminals and earth shall not be less than 10 Mohm when tested with 250 V DC.

4.2.1.2.3 DC insulation resistance between line terminals and between local terminals.

In Clause 6.2.2 the DC resistance between terminals and earth shall not be less than 10 Mohm when tested with 250 V DC.

4.2.1.2.4 Return loss

The return loss limit applies to the Z_R or TN12 impedance as described in 4.2.1.1.2. Z_{SL} is based on a short line terminated in 600 ohm.

The open circuit test for the Z_{ADSL} impedance does not need to be performed if either:

1. the exchange end ADSL modem has an integrated low pass splitter or
2. the procedures for removal of exchange based ADSL equipment are such that the ADSL modem and splitter are removed together.

4.2.1.2.5 Immunity to high level POTS signals

Background

4.2.2. ADDITIONS NOT COVERED IN ETSI SPECIFICATION APPLICABLE TO EXCHANGE SPLITTERS

Loss of power to the splitter or Acquirer's DSLAM, or other operations such as card changes in the DSLAM should not result in a reduction in performance or disconnection of the telephone service, although a short break of up to 10ms is permitted.

In order to avoid unacceptable degradation of Telstra's exchange testing, the total capacitance between A and B legs of the splitter with DSLAM connected must be less than 150 nF.

The Acquirer may apply test signals within the ADSL bands at any time provided those test signals are compliant with the ACIF Network Deployment Rules Code C559, either belonging to an existing Deployment Class or demonstrated to be compliant under the provisions for Non-deployment Class systems.

Testing of the line at DC or voice frequency may only be performed when the telephone service is inactive; in this case the method of determination of inactivity and the duration of the test is to be determined in consultation with Telstra.

Additionally, the splitter may optionally incorporate relay bypass to enable testing from the telephony port without the splitter or DSLAM connected.

The following paragraph is for information only ie not tested for this spec.

The allowable deployment classes for Telstra Wholesale Spectrum Sharing Service are Deployment Class 6a, 6b, 6d, 6e and 6f. Acquirers' DSLAM ADSL equipment must comply with the relevant ADSL transmit PSD masks and deployment rules of ITU-T G.992.1 and ACIF C559-3.

4.3. CUSTOMER END SPLITTER

The customer end splitter may be implemented as a centralized or an in line (distributed) splitter. New customer premises cabling is to be provided from the centralized splitter to the ADSL CPE. The splitter provides a low pass filtering functionality in the telephony path. The high pass component of the splitter is assumed to be in the ADSL CPE.

The low pass filtering at the customer end centralised splitter must comply with the requirements of ETSI TS 101 952-1-1 V1.1.1 (2002-05). The combined effect of up to 3 inline filters must comply with the requirements of ETSI TR 101.728 V1.1.1 (2002-05). The filters must also comply with the exclusions, changes and clarifications listed below. These changes have been made for the Australian telecommunications environment. Note that the maximum number of inline filters to be used on a PSTN service is 3.

Note, all relevant tests in ETSI TR 101.728 V1.1.1 (2000-12) and ETSI TS 101 952-1-1 V1.1.1 (2002-05) must be performed at both line polarities and at both maximum and minimum line current. ie all relevant tests in ETSI TR 101.728 V1.1.1 (2002-05) and ETSI TS 101 952-1-1 V1.1.1 (2002-05) must be repeated at four line conditions.

4.3.1. ETSI SPECIFICATION CHANGES AND CLARIFICATIONS FOR CUSTOMER END CENTRALIZED SPLITTER.

4.3.1.1. Testing Conditions (Section 5 of ETSI TS 101.952-1-1)

4.3.1.1.1 Feed currents

For clause 5.1.2, feed currents up to 125 mA DC may be encountered in Australia.. During the transition from the Ringing to the Offhook state, large transient currents in excess of 200mA may occur. However the requirements for testing remain as in clause 5.1.2.

4.3.1.1.2 Impedances

The ETSI specifications of return loss, etc are based on the European harmonized impedance Z_R . Note that the European harmonized impedance Z_R is a close match to the Australian TN12 complex impedance. Hence either impedance can be used as a reference impedance for testing. For example if the splitter passes with Z_r , then there is no need to test with TN12 (and vice verca). If a result fails marginally with Z_r then TN12 can be used as it may pass with this slightly different impedance TN12 (and vice verca).

4.3.1.2. Splitter Requirements (Section 6 of ETSI TS 101.952-1-1)

4.3.1.2.1 Option A splitters are required

4.3.1.2.2 DC insulation resistance between terminals and earth

In Clause 6.2.1 the DC resistance between terminals and earth shall not be less than 10 Mohm when tested with 250 V DC.

4.3.1.2.3 DC insulation resistance between line terminals and between local terminals.

In Clause 6.2.2 the DC resistance between terminals and earth shall not be less than 10 Mohm when tested with 250 V DC.

4.3.1.2.4 Return loss

The 14 dB return loss limit applies to the Z_R or TN12 impedance as described in 4.3.1.1.2. The return loss for the Z_{SL} impedance should be greater than 12 dB. (Z_{SL} is based on a short line terminated in 600 ohm).

A higher return loss value of 14 dB is required instead of 12 dB shown in Table 5 of Clause 6.6.1.1 for test 3, ie the Z_R impedance measurement.

4.3.1.2.5 Unbalance about Earth

The Unbalance about Earth requirements in Table 5 must be tightened as per the values in the following table.

Frequency range	State of S1	Value of R	Minimum Unbalance value
50 Hz to 600 Hz	closed	300	46 dB
600 Hz to 3 400 Hz	closed	300	52 dB
3 400 Hz to 4 000 Hz	closed	300	46 dB
4 kHz to 30 kHz	open	50	40 dB
30 kHz to 1 104 kHz	open	50	50 dB
1 104 kHz to 5 MHz	open	50	30 dB

4.3.1.2.6 Metering signals

The splitter does not need to accommodate 12kHz, 16 kHz or 50 Hz metering signals. Spectrum sharing is not available for loops carrying such services.

4.3.1.2.7 Signature Networks (section 7.1 of ETSI TR 101.728)

Signature Networks in clause 7.1 are unacceptable if they cause the insulation resistance tests in 5.1.2 or 5.1.3 to fail.

4.3.2. ETSI SPECIFICATION CHANGES AND CLARIFICATIONS FOR CUSTOMER END DISTRIBUTED SPLITTER.

4.3.2.1. General Functional Description of Splitters (Section 4 of ETSI TR 101.728)

4.3.2.1.1 Impedances

The ETSI specifications of return loss, etc are based on the European harmonized impedance Z_R . Note that the European harmonized impedance Z_R is a close match to the Australian TN12 complex impedance. Hence either impedance can be used as a reference impedance for testing. For example if the splitter passes with Z_r , then there is no need to test with TN12 (and vice versa). If a result fails marginally with Z_r then TN12 can be used as it may pass with this slightly different impedance TN12 (and vice versa).

4.3.2.1.2 Filter Configuration

The Acquirer may implement any of the options of section 4 for the location of the filter and DC blocking components, as these are within the Acquirer's domain.

4.3.2.2. Splitter Requirements (Section 5 of ETSI TR 101.728)

4.3.2.2.1 DC insulation resistance between terminals and earth

In Clause 5.1.2 the DC resistance between terminals and earth shall not be less than 10 Mohm when tested with 250 V DC.

4.3.2.2.2 DC insulation resistance between line terminals and between local terminals.

In Clause 5.1.3 the DC resistance between terminals and earth shall not be less than 10 Mohm when tested with 250 V DC.

4.3.2.2.3 Feed currents

For clause 5.1.5, feed currents up to 125 mA DC may be encountered in Australia.. During the transition from the Ringing to the Offhook state, large transient currents in excess of 200mA may occur. However the requirements for testing remain as in clause 5.1.5.

4.3.2.2.4 Ringing Volt Drop

The requirements of 5.3.1 and 5.4 apply for 25 Hz only (not 50 Hz)

4.3.2.2.5 Return loss

The 14 dB return loss limit applies to the Z_R or TN12 impedance as described in 4.3.2.1.1. The return loss for n Z_{SL} impedance should be greater than 12 dB. (Z_{SL} is based on a short line terminated in 600 ohm).

A higher return loss value of 14 dB is required instead of 12 dB shown in Table 4 of Clause 5.6 for test 3, ie the Z_R impedance measurement.

4.3.2.2.6 Longitudinal conversion loss

The longitudinal conversion loss requirements in Table 5 must be tightened as per the values in the following table.

Frequency range	State of S1	Value of R	Minimum Unbalance value
50 Hz to 600 Hz	closed	300	46 dB
600 Hz to 3 400 Hz	closed	300	52 dB
3 400 Hz to 4 000 Hz	closed	300	46 dB
4 kHz to 30 kHz	open	50	40 dB
30 kHz to 1 104 kHz	open	50	50 dB
1 104 kHz to 5 MHz	open	50	50 dB

4.3.2.2.7 Metering signals

The splitter does not need to accommodate 12kHz, 16 kHz or 50 Hz metering signals (Clause 5.12). Spectrum sharing is not available for loops carrying such services.

4.3.2.2.8 Signature Networks (section 7.1 of ETSI TR 101.728)

Signature Networks in clause 7.1 are unacceptable if they cause the insulation resistance tests in 5.1.2 or 5.1.3 to fail.

**4.3.3. ADDITIONS NOT COVERED IN ETSI SPECIFICATION APPLICABLE
CUSTOMER END SPLITTERS**

Telstra anticipates that ETSI will include on hook requirements similar to those in ETSI TS 101 952 sub part 1 in the yet to be published sub part 5. for distributed splitters. Therefore splitter suppliers should aim to meet the hook requirements in ETSI TS 101 952 sub part 1 . Note that the on hook requirements are desirable but not mandatory yet.

In order to avoid unacceptable attenuation of Telstra's PSTS, the total length of the tie cable from the Network Boundary Point (NBP) to the splitter shall be as specified in "Telstra Network Termination Device, Information for Cabling Providers" Guideline 012688

The Acquirer may apply test signals within the ADSL bands at any time provided those test signals are compliant with the ACIF Network Deployment Rules Code C559, either belonging to an existing Deployment Class or demonstrated to be compliant under the provisions for Non-deployment Class systems.

Testing of the line at DC or voice frequency may only be performed when the telephone service is inactive; in this case the method of determination of inactivity and the duration of the test is to be determined in consultation with Telstra.

The following paragraph is for information only ie not tested for this spec.
The allowable deployment classes for Telstra Wholesale Spectrum Sharing Service are Deployment Class 6a, 6b, 6d, 6e and 6f. Acquirers' ADSL equipment must comply with the relevant ADSL transmit PSD masks and deployment rules of ITU-T G.992.1 and ACIF S043-2.

5. DEFINITIONS

The following words, acronyms and abbreviations are referred to in this document.

Term	Definition
ACA	Australian Communications Authority
ACCC	Australian Competition and Consumer Commission
Acquirer	The service provider seeking to utilise Telstra Wholesale Spectrum Sharing Service on behalf of their retail customer.
AP	Access Provider
ADSL	Asymmetric Digital Subscriber Line
BEP	Building Entry Point
CAM	Customer Access Module
CCF	Cross Connect Facility
CPE	Customer Premises Equipment
ECP	Equipment Connection Point
IDF	Intermediate Distribution Frame
MDF	Main Distribution Frame
NBP	Network Boundary Point
NTD	Network Termination Device
PSTN	Public Switched Telephone Network
PSD	Power Spectral Density
SDP	Service Delivery Point
ULLS	Unconditioned Local Loop Service

6. REFERENCES

Document Number	Title
Technical Reference RCIT.0006	Customer End Splitter Information for ADSL/POTS Spectrum Sharing
Technical Reference RCIT.0005	Wholesale Spectrum Sharing Service Issue 1.0
Guideline 012688	"Telstra Network Termination Device, Information for Cabling Providers"
ETSI TR 101.728 V1.2.1 (2002-05)	Access and Terminals (AT); Study for the Specification of the Low-Pass Section of POTS/ADSL Splitters
ETSI TS 101 952-1-1 V1.1.1 (2002-05)	Access network xDSL transmission filters; Part 1: ADSL splitters for European deployment; Sub-part 1: Specification of the low pass part of ADSL/POTS splitters
ETSI TS 101 952-1-2 V1.1.1 (2002-05)	Access network xDSL transmission filters; Part 1: ADSL splitters for European deployment; Sub-part 2: Specification of the high pass part of ADSL/POTS splitters
ITU-T G.992	<u>Asymmetric digital subscriber line (ADSL) transceivers</u>
AS/ACIF S002: December 2001	Analogue interworking and non-interference requirements for Customer Equipment for connection to the Public Switched Telephone Network
AS/ACIF S043 - PART 1	Requirements for Customer Equipment for connection to a metallic local loop interface of a Telecommunications Network - Part 1: General
AS/ACIF S043 - PART 2	Requirements for Customer Equipment for connection to a metallic local loop interface of a Telecommunications Network - Part 2: Digital Subscriber Line (DSL)
AS/ACIF S043 - PART 3	Requirements for Customer Equipment for connection to a metallic local loop interface of a Telecommunications Network - Part 3: DC, low frequency AC and voiceband
DR/ACIF C559	INDUSTRY CODE UNCONDITIONED LOCAL LOOP SERVICE Network Deployment Rules
DR/ACIF C569	INDUSTRY CODE UNCONDITIONED LOCAL LOOP SERVICE Ordering, Provisioning and Customer Transfer
ACIF G572	INDUSTRY CODE UNCONDITIONED LOCAL LOOP SERVICE Fault Management
AS/NZS 60950:2000	Safety of Information technology equipment (IEC 60950:1999, MOD)

AS/NZS 3548:1995

Limits and methods of measurement of radio disturbance characteristics of information technology equipment (IEC/CISPR 22:1993)

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7. DOCUMENT CONTROL SHEET

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If you have a suggestion for improving this document, complete and forward a copy of *Suggestions for Improvements to Documentation* (form 000 001-F01).

Issue No	Issue Date	Nature of Amendment
Issue 1.0	26/4/02	Document updated to include Merv Sewell's comments.
2	21/05/02	Minor corrections after internal review.
2	22/7/2002	Separation of exchange and customer end parts
Draft	30/8/2002	Major changes due to new ETSI TS
Draft	12/9/2002	Requirement for partial HPF and DC block at exchange end.
Draft	18/9/2002	Minor corrections after internal review.
Draft	20/02/03	Corrections after being released to industry. This RCIT will change again with new ETSI Spec for distributed splitters which should be published in the next few months.

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