

AS/NZS 15050:1999
ISO/IEC 15050:1997

AS/NZS 15050

Australian/New Zealand Standard™

**Information technology—
Telecommunications and
information exchange between
systems—Private integrated
services network—Inter-exchange
signalling protocol—Advice of
charge supplementary services**

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AS/NZS 15050:1999

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT/16, Private Telecommunications Networking.

This Standard is identical with, and has been reproduced from, ISO/IEC 15050:1997, *Information technology—Telecommunications and information exchange between systems—Private Integrated Services Network—Inter-exchange signalling protocol—Advice of charge supplementary services*.

The objective of this Standard is to provide private integrated services network (PISN) designers and users with the specification for signalling protocol for use at the Q reference point between PISN exchanges, in order to advise the caller of charging information worldwide.

The Standard is one of a series of emerging ISO/IEC Standards applicable to private integrated services networking. The series uses the ISDN concepts as developed by ITU-T and is also within the framework of Standards for Open Systems Interconnection (OSI) as defined by ISO/IEC JTC 1.

The number of this Standard is not reproduced on each page; its identity is shown only on the cover and title page.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

For the purpose of this Standard, the ISO/IEC text should be modified as follows:

- (a) The words 'this Australian/New Zealand Standard' should replace the words 'this International Standard' wherever they appear.
- (b) References to International Standards should be replaced by references, where appropriate, to the following Australian/New Zealand Standards:

*Reference to International Standard
or other publication*

Australian/New Zealand Standard

ISO/IEC

AS/NZS

11572 Information technology—
Telecommunications and information
exchange between systems—
Private Integrated Services Network—
Circuit mode bearer services—
Inter-exchange signalling procedures
and protocol

11572 Information technology—
Telecommunications and information
exchange between systems—
Private integrated services network—
Circuit mode bearer services—
Inter-exchange signalling procedures
and protocol

11574 Information technology—
Telecommunications and information
exchange between systems—
Private Integrated Services Network—
Circuit-mode 64 kbit/s bearer
services—Service description,
functional capabilities and
information flows

4135 Information technology—
Telecommunications and information
exchange between systems—
Private integrated services network—
Circuit-mode 64 kbit/s bearer
services—Service description,
functional capabilities and
information flows

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11579-1	Part 1: Reference configuration for PISN Exchanges (PINX)	4136.1	Part 1: Reference configuration for PISN exchanges (PINX)
11582	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Generic functional protocol for the support of supplementary services— Inter-exchange signalling procedures and protocol	4239	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Generic functional protocol for the support of supplementary services— Inter-exchange signalling procedures and protocol
13865	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Specification, functional model and information flows—Call transfer supplementary service	4337	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Specification, functional model and information flows—Call transfer supplementary service
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13873	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Inter-exchange signalling protocol— Call diversion supplementary services	4342	Information technology— Telecommunications and information exchange between systems— Private integrated services network— Inter-exchange signalling protocol— Call diversion supplementary services
15049	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Specification, functional model and information flows—Advice of charge supplementary services	—	
15054	Information technology— Telecommunications and information exchange between systems— Private Integrated Services Network— Inter-exchange signalling protocol— Call interception additional network feature	—	

CCITT

Rec. I.112 Vocabulary for terms for ISDNs —

Rec. I.130 Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN —

Rec. I.210 Principles of telecommunication services supported by an ISDN and the means to describe them —

Rec. Z.100 Specification and description language —

ITU-T

Rec. Q.950 Digital Subscriber Signalling System No. 1 (DSS1)—
Supplementary services protocols, structure and general principles —

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AUSTRALIAN/NEW ZEALAND STANDARD

Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Advice of charge supplementary services**1 Scope**

This International Standard specifies the signalling protocol for the support of the Advice Of Charge supplementary services (SS-AOC) at the Q reference point between Private Integrated Services Network Exchanges (PINX) connected together within a Private Integrated Services Network (PISN).

SS-AOC is a set of supplementary services which enable a user to receive information about the charging of its calls that leave the PISN and enter another network.

The three AOC supplementary services are:

a) Charging information at call set-up time (AOC-S)

SS-AOC-S enables the user to receive information about the charging rates at call set-up time and also to receive further information during the call if there is a change of charging rates.

b) Charging information during the call (AOC-D)

SS-AOC-D enables a user to receive information on the recorded charges for a call during the active phase of the call.

c) Charging information at the end of the call (AOC-E)

SS-AOC-E enables a user to receive information on the recorded charges for a call when the call is terminated.

The Q reference point is defined in ISO/IEC 11579-1.

Service specifications are produced in three stages and according to the method specified in CCITT Recommendation I.130. This International Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in ISO/IEC 15049.

The signalling protocol for SS-AOC operates on top of the signalling protocol for basic circuit switched call control, as specified in ISO/IEC 11572, and uses certain aspects of the generic procedures for the control of supplementary services specified in ISO/IEC 11582.

This International Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between SS-AOC and other supplementary services and ANFs.

Note - Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

This International Standard is applicable to PINXs which can interconnect to form a PISN.

2 Conformance

In order to conform to this International Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in annex A.

Conformance to this International Standard includes conforming to those clauses that specify protocol interactions between SS-AOC and other supplementary services and ANFs for which signalling protocols at the Q reference point are supported in accordance with the stage 3 standards concerned.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11572:1997, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol.*

- ISO/IEC 11574:1994, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode 64 kbit/s bearer services - Service description, functional capabilities and information flows.*
- ISO/IEC 11579-1:1994, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 1: Reference configuration for PISN Exchanges (PINX).*
- ISO/IEC 11582:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Generic functional protocol for the support of supplementary services - Inter-exchange signalling procedures and protocol.*
- ISO/IEC 13865:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Call transfer supplementary service.*
- ISO/IEC 13869:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call transfer supplementary service.*
- ISO/IEC 13873:1995, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call diversion supplementary services.*
- ISO/IEC 15049:1997, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Advice of charge supplementary services.*
- ISO/IEC 15054:1997, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call interception additional network feature.*
- CCITT Rec. I.112:1988, *Vocabulary of terms for ISDNs.*
- CCITT Rec. I.130:1988, *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN.*
- CCITT Rec. I.210:1988, *Principles of telecommunication services supported by an ISDN and the means to describe them.*
- CCITT Rec. Z.100:1988, *Specification and description language.*
- ITU-T Rec. Q.950:1993, *Digital Subscriber Signalling System No. 1 (DSS1) - Supplementary services protocols, structure and general principles.*

4 Definitions

For the purposes of this International Standard, the following definitions apply.

4.1 External definitions

This International Standard uses the following terms defined in other documents:

- Application Protocol Data Unit (APDU) (ISO/IEC 11582)
- Basic Service (CCITT Rec. I.210)
- Call, Basic Call (ISO/IEC 11582)
- Originating PINX (ISO/IEC 11572)
- Outgoing Gateway PINX (ISO/IEC 11572)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated Services Network Exchange (PINX) (ISO/IEC 11579-1)
- Signalling (CCITT Rec. I.112)
- Supplementary Service (CCITT Rec. I.210)
- Supplementary Service Control Entity (ISO/IEC 11582)
- Terminating PINX (ISO/IEC 11572)
- Transit PINX (ISO/IEC 11572)

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- User (ISO/IEC 11574)
- User A (ISO/IEC 13865)

4.2 Other definitions

advice mode : The mode in which an Originating PINX receives advice of charge information from a Gateway PINX. This can be charge rate provision, interim charge provision or final charge provision.

advice mode combination : A combination of one or more advice modes operating simultaneously.

charge rate provision : The provision to the Originating PINX of information concerning the charge rate for the call.

interim charge provision : The provision to the Originating PINX of subtotal charge information at intervals during the call and of the total charge information at the end of the call.

Note - When interim charge provision is used and the call is transferred, if the transferring user continues to be charged after transfer, no total charge information is provided when the call resulting from transfer finishes.

final charge provision : The provision to the Originating PINX of total charge information at the end of the call.

Note - When final charge provision is used and the call is transferred, if the transferring user continues to be charged after transfer, the total charge information is provided to the Transferring PINX when the call resulting from transfer finishes.

Charging Association Information : Information that allows final charge information to be associated with the call to which it relates.

Accounting Function : The entity that is able to determine charges incurred in another network (e.g. by counting meter pulses, by use of a public ISDN AOC service, or by calculation) and the assignment of these charges to the PISN user(s) involved.

5 List of acronyms

ANF	Additional Network Feature
AOC	Advice of Charge
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS	Supplementary Service

6 Signalling protocol for the support of SS-AOC

6.1 SS-AOC description

SS-AOC is a set of supplementary services which enable a user to receive information about the charging of its calls that leave the PISN and enter another network.

The three AOC supplementary services are:

a) Charging information at call set-up time (AOC-S)

SS-AOC-S enables the user to receive information about the charging rates at call set-up time and also to receive further information during the call if there is a change of charging rates.

b) Charging information during the call (AOC-D)

SS-AOC-D enables a user to receive information on the recorded charges for a call during the active phase of the call.

c) Charging information at the end of the call (AOC-E)

SS-AOC-E enables a user to receive information on the recorded charges for a call when the call is terminated.

These three supplementary services are supported across the PISN by charge rate provision, interim charge provision and final charge provision or combinations thereof.

Note - For example, SS-AOC-D could be supported by charge rate provision, by interim charge provision, or by charge rate provision in conjunction with final charge provision.

6.2 SS-AOC operational requirements

6.2.1 Requirements on the Originating PINX

Call establishment procedures for the outgoing side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572 shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.2 Requirements on the Terminating PINX

Call establishment procedures for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.3 Requirements on the Outgoing Gateway PINX

Call establishment procedures for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for an Outgoing Gateway PINX, shall apply.

6.2.4 Requirements on a Transit PINX

Basic call procedures specified in ISO/IEC 11572 for a Transit PINX shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

6.2.5 Additional requirements for a Transferring or Diverting PINX that can receive final charge information for a call resulting from transfer or a diverted call

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX, shall apply.

6.3 SS-AOC coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply.

Table 1 - Operations in Support of SS-AOC

SS-AOC-Operations	{iso (1) standard (0) pss1-advice-of-charge (15050) advice-of-charge-operations (0)}
DEFINITIONS EXPLICIT TAGS ::=	
BEGIN	
IMPORTS	OPERATION, ERROR FROM Remote-Operation-Notation {joint-iso-ccitt (2) remote-operations (4) notation (0)} Extension FROM Manufacturer-specific-service-extension-definition {iso (1) standard (0) pss1-generic-procedures (11582) msi-definition (0)} notAvailable, supplementaryServiceInteractionNotAllowed FROM General-Error-List {ccitt (0) recommendation (0) q (17) 950 general-error-list (1)} PartyNumber FROM Addressing-Data-Elements { iso (1) standard (0) pss1-generic-procedures (11582) addressing-data-elements (9) } ;
AocRate	::= OPERATION ARGUMENT AocRateArg
AocRateArg	::= SEQUENCE { aocRate CHOICE { chargeNotAvailable NULL, aocSCurrencyInfoList AOCSCurrencyInfoList }, rateArgExtension CHOICE { extension [1] IMPLICIT Extension, multipleExtension [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
AocInterim	::= OPERATION ARGUMENT AocInterimArg
AocInterimArg	::= SEQUENCE { interimCharge CHOICE { chargeNotAvailable [0] IMPLICIT NULL, freeOfCharge [1] IMPLICIT NULL, specificCurrency SEQUENCE { recordedCurrency [1] IMPLICIT RecordedCurrency, } } }

Table 1 - Operations in Support of SS-AOC (continued)

		interimBillingId[2] IMPLICIT InterimBillingId OPTIONAL }
		},
		interimArgExtension CHOICE {
		extension [1] IMPLICIT Extension,
		multipleExtension [2] IMPLICIT SEQUENCE OF Extension
		} OPTIONAL
		}
AocFinal	::=	OPERATION
		ARGUMENT AocFinalArg
AocFinalArg	::=	SEQUENCE {
		finalCharge CHOICE {
		chargeNotAvailable [0] IMPLICIT NULL,
		freeOfCharge [1] IMPLICIT NULL,
		specificCurrency SEQUENCE {
		recordedCurrency [1] IMPLICIT RecordedCurrency,
		finalBillingId[2] IMPLICIT FinalBillingId OPTIONAL }
		},
		chargingAssociation ChargingAssociation OPTIONAL,
		finalArgExtension CHOICE {
		extension [1] IMPLICIT Extension,
		multipleExtension [2] IMPLICIT SEQUENCE OF Extension
		} OPTIONAL
		}
AOCSCurrencyInfoList	::=	SEQUENCE SIZE(1..10) OF AOCSCurrencyInfo
AOCSCurrencyInfo	::=	SEQUENCE {
		chargedItem ChargedItem,
		rateType CHOICE {
		durationCurrency [1] IMPLICIT DurationCurrency,
		flatRateCurrency [2] IMPLICIT FlatRateCurrency,
		volumeRateCurrency [3] IMPLICIT VolumeRateCurrency,
		specialChargingCode SpecialChargingCode,
		freeOfCharge [4] IMPLICIT NULL,
		currencyInfoNotAvailable [5] IMPLICIT NULL,
		freeOfChargefromBeginning [6] IMPLICIT NULL
		}
		}
ChargedItem	::=	ENUMERATED {
		basicCommunication (0),
		callAttempt (1),
		callSetup (2),
		userToUserInfo (3),
		operationOfSupplementaryServ (4) }

Table 1 - Operations in Support of SS-AOC (continued)

DurationCurrency	::=	SEQUENCE { dCurrency [1] IMPLICITCurrency, dAmount [2] IMPLICITAmount, dChargingType [3] IMPLICITChargingType, dTime [4] IMPLICTime, dGranularity [5] IMPLICTime OPTIONAL }
FlatRateCurrency	::=	SEQUENCE { fRCurrency [1] IMPLICIT Currency, fRAmount [2] IMPLICIT Amount }
VolumeRateCurrency	::=	SEQUENCE { vRCurrency [1] IMPLICIT Currency, vRAmount [2] IMPLICIT Amount, vRVolumeUnit [3] IMPLICIT VolumeUnit }
SpecialChargingCode	::=	INTEGER (1..10)
RecordedCurrency	::=	SEQUENCE { rCurrency [1] IMPLICIT Currency, rAmount [2] IMPLICIT Amount }
InterimBillingId	::=	ENUMERATED { normalCharging (0), creditCardCharging (2) }
FinalBillingId	::=	ENUMERATED { normalCharging (0), creditCardCharging (2), callForwardingUnconditional (3), callForwardingBusy (4), callForwardingNoReply (5), callDeflection (6), callTransfer (7) }
Currency	::=	IA5String (SIZE (0..10)) -- SIZE(0) shall indicate the default currency of the PISN -- The representation of other currencies is outside the scope of this standard
Amount	::=	SEQUENCE { currencyAmount [1] IMPLICIT CurrencyAmount, multiplier [2] IMPLICIT Multiplier }
CurrencyAmount	::=	INTEGER (0..16777215)

Table 1 - Operations in Support of SS-AOC (continued)

Multiplier	::=	ENUMERATED { oneThousandth (0), oneHundredth (1), oneTenth (2), one (3), ten (4), hundred (5), thousand (6) }
Time	::=	SEQUENCE { lengthOfTimeUnit [1] IMPLICIT LengthOfTimeUnit, scale [2] IMPLICIT Scale }
LengthOfTimeUnit	::=	INTEGER (0..16777215)
Scale	::=	ENUMERATED { oneHundredthSecond (0), oneTenthSecond (1), oneSecond (2), tenSeconds (3), oneMinute (4), oneHour (5), twentyFourHours (6) }
VolumeUnit	::=	ENUMERATED { octet (0), segment (1), message (2) }
ChargingType	::=	ENUMERATED { continuousCharging (0), stepFunction (1) }
ChargingAssociation	::=	CHOICE { chargeNumber [0] PartyNumber, chargeIdentifier ChargeIdentifier }
ChargeIdentifier	::=	INTEGER (-32768..32767)
ChargeRequest	::=	OPERATION ARGUMENT ChargeRequestArg RESULT ChargeRequestRes ERRORS { freeOfCharge, supplementaryServiceInteractionNotAllowed, notAvailable, unspecified }
GetFinalcharge	::=	OPERATION ARGUMENT DummyArg

Table 1 - Operations in Support of SS-AOC (continued)

ChargeRequestArg	::=	SEQUENCE { adviceModeCombinations SEQUENCE SIZE(0..7) OF AdviceModeCombination, chargeReqArgExtension CHOICE { extension [1]IMPLICIT Extension, multipleExtension [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
ChargeRequestRes	::=	SEQUENCE { adviceModeCombination AdviceModeCombination, chargeReqResExtension CHOICE { extension [1]IMPLICIT Extension, multipleExtension [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }
AdviceModeCombination	::=	ENUMERATED { -- advice mode combination rate (0), -- charge rate provision rateInterim (1), -- charge rate and interim charge provision rateFinal (2), -- charge rate and final charge provision interim (3), -- interim charge provision final (4), -- final charge provision interimFinal (5), -- interim charge and final charge provision rateInterimFinal (6)} -- charge rate, interim charge and final -- charge provision
DummyArg	::=	CHOICE{ none NULL, extension [1] IMPLICIT Extension, multipleExtension [2] IMPLICIT SEQUENCE OF Extension }
-- The following OPERATION applies for the interaction with Call Transfer		
AocComplete	::=	OPERATION ARGUMENT AocCompleteArg RESULT AocCompleteRes ERRORS {supplementaryServiceInteractionNotAllowed}
AocCompleteArg	::=	SEQUENCE { chargedUser PartyNumber, chargingAssociation ChargingAssociation OPTIONAL, completeArgExtension CHOICE { extension [1]IMPLICIT Extension, multipleExtension [2] IMPLICIT SEQUENCE OF Extension } OPTIONAL }

Table 1 - Operations in Support of SS-AOC (concluded)

AocCompleteRes::=	SEQUENCE {	chargingOption ChargingOption,	completeResExtension	CHOICE {
		extension [1]IMPLICIT Extension,		
		multipleExtension [2] IMPLICIT SEQUENCE OF Extension		} OPTIONAL
	}			
ChargingOption	::=	ENUMERATED{		
		aocFreeOfCharge (0),		
		aocContinueCharging (1),		
		aocStopCharging (2)		
		}		
-- The following OPERATION applies for the interaction with Call Diversion				
AocDivChargeReq	::=	OPERATION		
		ARGUMENT AocDivChargeReqArg		
AocDivChargeReqArg	::=	SEQUENCE {		
		divertingUser PartyNumber,		
		chargingAssociation ChargingAssociation	OPTIONAL,	
		diversionType DiversionType,		
		aocDivChargeReqArgExt	CHOICE {	
		extension [1]IMPLICIT Extension,		
		multipleExtension [2] IMPLICIT SEQUENCE OF Extension		} OPTIONAL
		}		
DiversionType	::=	ENUMERATED {		
		callForwardingUnconditional (0),		
		callForwardingBusy (1),		
		callForwardingNoReply (2),		
		callDeflection (3) }		
chargeRequest	ChargeRequest	::=	59	
getFinalCharge	GetFinalcharge	::=	60	
aocFinal	AocFinal	::=	61	
aocInterim	AocInterim	::=	62	
aocRate	AocRate	::=	63	
aocComplete	AocComplete	::=	64	
aocDivChargeReq	AocDivChargeReq	::=	65	
Unspecified	::= ERROR PARAMETER Extension			
unspecified	Unspecified ::= 1008			
freeOfCharge	ERROR	::= 1016		
END	-- of SS-AOC-Operations			