

**Information
technology —
Telecommunications
and information
exchange between
systems —
Private Integrated
Services Network —
Specification,
functional model and
information flows —
Advice of charge
supplementary services**

ICS 33.040.40; 35.110

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

National foreword

This British Standard reproduces verbatim ISO/IEC 15049:1997 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee IST/6, Data communications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been renumbered as IEC 60027-1. For a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

Cross-references

The British Standards which implement international or European publications referred to in this document, may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO/IEC title page, pages ii to viii, pages 1 to 63 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date	Comments

This British Standard, having been prepared under the direction of the DISC Board, was published under the authority of the Standards Board and comes into effect on 15 December 1997

© BSI 04-2000

ISBN 0 580 28857 9

Contents

	Page
National foreword	Inside front cover
Foreword	vii
Text of ISO/IEC 15049	1

INTERNATIONAL STANDARD

**ISO/IEC
15049**

First edition
1997-05-15

Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Advice of charge supplementary services

*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé à intégration de services —
Spécification, modèle fonctionnel et flux d'informations — Orientation des
services supplémentaires de charge*



Reference number
ISO/IEC 15049:1997(E)

Contents

	Page
Foreword	vii
Introduction	1
1 Scope	1
2 Conformance	1
3 Normative references	1
4 Definitions	2
4.1 External definitions	2
4.2 Other definitions	3
5 List of acronyms	4
6 SS-AOC-S stage 1 specification	4
6.1 Description	4
6.1.1 General description	4
6.1.2 Qualifications on applicability to telecommunication services	4
6.2 Procedures	4
6.2.1 Provision/withdrawal	4
6.2.2 Normal procedures	4
6.2.3 Exceptional procedures	5
6.3 Interactions with other supplementary services and ANFs	5
6.3.1 Advice of charge: charging information during the call (AOC-D)	5
6.3.2 Advice of charge: charging information at the end of the call (AOC-E)	5
6.3.3 Calling Line Identification Presentation (CLIP)	5
6.3.4 Connected Line Identification Presentation (COLP)	5
6.3.5 Calling/Connected Line Identification restriction (CLIR)	5
6.3.6 Calling Name Identification presentation (CNIP)	5
6.3.7 Connected Name Identification Presentation (CONP)	5
6.3.8 Calling/Connected Name Identification restriction (CNIR)	5
6.3.9 Call Diversion (CFU/CFB/CFNR/CD)	6
6.3.10 Call Interception (CINT)	6
6.3.11 Call Intrusion (CI)	6
6.3.12 Call Offer (CO)	6
6.3.13 Call Transfer (CT)	6
6.3.14 Completion of Calls to Busy Subscribers (CCBS)	6
6.3.15 Completion of Calls on No Reply (CCNR)	6
6.3.16 Do Not Disturb (DND)	6
6.3.17 Do Not Disturb Override (DNDO)	6
6.3.18 Path replacement (ANF-PR)	6
6.3.19 Recall (RE)	6
6.4 Interworking considerations	6
6.4.1 Interworking with public ISDN	6
6.4.2 Interworking with PSTN	7
6.5 Overall SDL	7
7 SS-AOC-D stage 1 specification	7
7.1 Description	7
7.1.1 General description	7
7.1.2 Qualifications on applicability to telecommunication services	7
7.2 Procedures	7
7.2.1 Provision/withdrawal	7
7.2.2 Normal procedures	7
7.2.3 Exceptional procedures	8

	Page
7.3 Interactions with other supplementary services and ANFs	9
7.3.1 Advice of charge: charging information at call set-up time (AOC-S)	9
7.3.2 Advice of charge: charging information at the end of the call (AOC-E)	9
7.3.3 Calling Line Identification Presentation (CLIP)	9
7.3.4 Connected Line Identification Presentation (COLP)	9
7.3.5 Calling/Connected Line Identification restriction (CLIR)	9
7.3.6 Calling Name Identification presentation (CNIP)	9
7.3.7 Connected Name Identification Presentation (CONP)	9
7.3.8 Calling/Connected Name Identification restriction (CNIR)	9
7.3.9 Call Diversion (CFU/CFB/CFNR/CD)	9
7.3.10 Call Interception (CINT)	9
7.3.11 Call Intrusion (CI)	9
7.3.12 Call Offer (CO)	10
7.3.13 Call Transfer (CT)	10
7.3.14 Completion of Calls to Busy Subscribers (CCBS)	10
7.3.15 Completion of Calls on No Reply (CCNR)	10
7.3.16 Do Not Disturb (DND)	10
7.3.17 Do Not Disturb Override (DNDO)	10
7.3.18 Path replacement (ANF-PR)	10
7.3.19 Recall (RE)	10
7.4 Interworking considerations	10
7.4.1 Interworking with public ISDN	10
7.4.2 Interworking with PSTN	10
7.5 Overall SDL	10
8 SS-AOC-E stage 1 specification	12
8.1 Description	12
8.1.1 General description	12
8.1.2 Qualifications on applicability to telecommunication services	12
8.2 Procedures	12
8.2.1 Provision/withdrawal	12
8.2.2 Normal procedures	12
8.2.3 Exceptional procedures	12
8.3 Interactions with other supplementary services and ANFs	13
8.3.1 Advice of charge: charging information at call set-up time (AOC-S)	13
8.3.2 Advice of charge: charging information during the call (AOC-D)	13
8.3.3 Calling Line Identification Presentation (CLIP)	13
8.3.4 Connected Line Identification Presentation (COLP)	13
8.3.5 Calling/Connected Line Identification restriction (CLIR)	13
8.3.6 Calling Name Identification presentation (CNIP)	13
8.3.7 Connected Name Identification Presentation (CONP)	13
8.3.8 Calling/Connected Name Identification restriction (CNIR)	13
8.3.9 Call Diversion (CFU/CFB/CFNR/CD)	13
8.3.10 Call Interception (CINT)	13
8.3.11 Call Intrusion (CI)	13
8.3.12 Call Offer (CO)	13
8.3.13 Call Transfer (CT)	14
8.3.14 Completion of Calls to Busy Subscribers (CCBS)	14
8.3.15 Completion of Calls on No Reply (CCNR)	14

	Page
8.3.16 Do Not Disturb (DND)	14
8.3.17 Do Not Disturb Override (DNDO)	14
8.3.18 Path replacement (ANF-PR)	14
8.3.19 Recall (RE)	14
8.4 Interworking considerations	14
8.4.1 Interworking with public ISDN	14
8.4.2 Interworking with PSTN	14
8.5 Overall SDL	16
9 SS-AOC stage 2 specification	16
9.1 Functional model	16
9.1.1 Functional model description	16
9.1.2 Description of functional entities	16
9.1.3 Relationship of functional model to basic call functional model	17
9.2 Information flows	17
9.2.1 Definition of information flows	17
9.2.2 Relationship of information flows to basic call information flows	26
9.2.3 Examples of information flow sequences	27
9.3 Functional entity actions	44
9.3.1 Functional entity actions of FE1	44
9.3.2 Functional entity actions of FE2	44
9.3.3 Functional entity actions of FE3	45
9.4 Functional entity behaviour	45
9.4.1 Behaviour of FE1	45
9.4.2 Behaviour of FE2	46
9.4.3 Behaviour of FE3	53
9.5 Allocation of functional entities to physical equipment	55
Annex A (normative) Structures, contents and application of charging information given by AOC-S	57
Annex B (normative) Structures, contents and application of charging information given by AOC-D	59
Annex C (normative) Structures, contents and application of charging information given by AOC-E	60
Annex D (informative) Charging assumptions for advice of charge in PISNs	61
Figure 1 — SS-AOC-S, overall SDL	8
Figure 2 — SS-AOC-D, overall SDL	11
Figure 3 — SS-AOC-E, overall SDL	15
Figure 4 — Functional Model for SS-AOC	16
Figure 5 — Example relationship between model for SS-AOC and Basic Call	17
Figure 6 — Information flow sequence — Normal operation of SS-AOC with charging rate request when originating a call to another network	29
Figure 7 — Information flow sequence — Normal operation of SS-AOC with charging rate request later during the establishment phase of a call to another network	30
Figure 8 — Information flow sequence — Normal operation of SS-AOC with charging rate request later during the active phase of a call to another network	31
Figure 9 — Information flow sequence — Normal operation of SS-AOC with interim charging request charging when originating a call to another network (the other user releases first)	32

	Page
Figure 10 — Information flow sequence — Normal operation of SS-AOC with interim charging request later during the active phase of a call to another network (the other user releases first)	33
Figure 11 — Information flow sequence — Normal operation of SS-AOC with interim charging request for a call to another network (the served user releases first)	34
Figure 12 — Information flow sequence — Normal operation of SS-AOC with final charging request when originating a call to another network (the other user releases first)	35
Figure 13 — Information flow sequence — Normal operation of SS-AOC with final charging request later during the active phase of a call to another network (the other user releases first)	36
Figure 14 — Information flow sequence — Normal operation of SS-AOC with final charging request for a call to another network (the served user releases first)	37
Figure 15 — Information flow sequence — Normal operation of SS-AOC-D with rate_and_final charging request when originating a call to another network (the other user releases first)	38
Figure 16 — Information flow sequence — Normal operation of SS-AOC-S and SS-AOC-E with rate_and_final charging as a preferred request (fallback: rate) when originating a call to another network (the other user releases first)	39
Figure 17 — Information flow sequence — Normal operation of SS-AOC-S with Call Transfer; charging rate has been requested for user A prior to transfer	40
Figure 18 — Information flow sequence — Normal operation of SS-AOC-D with Call Transfer; interim charging has been requested for user A prior to transfer	41
Figure 19 — Information flow sequence — Normal operation of SS-AOC-E with Call Transfer final charging has been requested for user A prior to transfer	42
Figure 20 — Information flow sequence — Normal operation of SS-AOC with Call Diversion; the diverting user is provided with SS-AOC-E	43
Figure 21 — SS-AOC, SDL for functional entity FE1	46
Figure 22 (part 1) — SS-AOC, SDL for functional entity FE2	47
Figure 22 (part 2) — SS-AOC, SDL for functional entity FE2	48
Figure 22 (part 3) — SS-AOC, SDL for functional entity FE2	49
Figure 22 (part 4) — SS-AOC, SDL for functional entity FE2	50
Figure 22 (part 5) — SS-AOC, SDL for functional entity FE2	51
Figure 22 (part 6) — SS-AOC, SDL for functional entity FE2	52
Figure 23 (part 1) — SS-AOC, SDL for functional entity FE3	53
Figure 23 (part 2) — SS-AOC, SDL for functional entity FE3	54
Figure 23 (part 3) — SS-AOC, SDL for functional entity FE3	55
Table 1 — Content of ra-REQUEST	17
Table 2 — Content of ra-INFORM1	18
Table 3 — Content of ra-INFORM2	19
Table 4 — Content of ra-AOC-REJECT	20
Table 5 — Content of ra-CHARGE-ID	21
Table 6 — Content of rb-CHARGE-REQUEST	21
Table 7 — Content of rb-CHARGE-RATE	22
Table 8 — Content of rb-INTERIM-CHARGE	24

	Page
Table 9 — Content of rb-FINAL-CHARGE	25
Table 10 — Content of rb-CHARGE-COMPLETE-AT-TRANSFER	26
Table 11 — Content of rb-DIVERSION-CHARGE-REQUEST	26
Table 12 — Scenarios for the allocation of FEs to physical equipment	56
Table 13 — Scenarios for the allocation of FEs to physical equipment (after Call Transfer)	56
Table 14 — Scenarios for the Allocation of FEs to Physical Equipment (after Call Diversion)	56

Descriptors: Data processing, information interchange, telecommunications, network interconnection, telecommunication network, private network, ISDN, data transmission, services.

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 15049 was prepared by ECMA (as ECMA-211) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annex A, Annex B and Annex C form an integral part of this International Standard. Annex D is for information only.

Introduction

This International Standard is one of a series of standards defining services and signalling protocols applicable to Private Integrated Services Networks. The series uses the ISDN concepts as developed by ITU-T (formerly CCITT) and is also within the framework of standards for open systems interconnection as defined by ISO.

This International Standard specifies the Advice of Charge supplementary services.

This International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC 1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

The services specified are compatible with the equivalent services specified by ITU-T for public ISDNs.

1 Scope

This International Standard specifies the Supplementary Services Advice of Charge (SS-AOC), which are applicable to various basic services supported by Private Integrated Services Networks (PISN). Basic services are specified in ISO/IEC 11574.

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.

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.

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

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

The provision of charging information to the called user, the provision of charging information for calls that do not leave the PISN, and PISN accounting are outside the scope of this International Standard.

Charging assumptions which apply to the specification of SS-AOC in this International Standard are contained in Annex D.

Service specifications are produced in three stages, according the method described in CCITT Rec. I.130. This International Standard contains the stage 1 and stage 2 specifications of SS-AOC. The stage 1 specifications (clauses 6, 7, 8) specify the supplementary services as seen by users of PISNs. The stage 2 specification (clause 9) identifies the functional entities involved in the supplementary services and the information flows between them.

2 Conformance

In order to conform to this International Standard, a Stage 3 standard shall specify signalling protocols and equipment behaviour that are capable of being used in a PISN which supports the supplementary services specified in this International Standard. This means that, to claim conformance, a Stage 3 standard is required to be adequate for the support of those aspects of clauses 6, 7 and 8 (stage 1) and clause 9 (stage 2) which are relevant to the interface or equipment to which the Stage 3 standard applies.

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 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 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 13872:1995, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Call diversion supplementary services.*

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.*

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:

— Basic Service	(CCITT Rec. I.210)
— Connection	(CCITT Rec. I.112)
— Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
— Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
— Service	(CCITT Rec. I.112)
— Signalling	(CCITT Rec. I.112)
— Supplementary Service	(CCITT Rec. I.210)
— User	(ISO/IEC 11574)

For the description of the interaction with the supplementary service Call Transfer, the following terms are used, which are defined in ISO/IEC 13865:

- Primary call
- Secondary call
- User A (the transferring user)
- User B
- User C
- Transfer by join
- Transfer by rerouting

For the description of the interaction with the Diversion supplementary services, the following terms are used, which are defined in ISO/IEC 13872:

- Diverting user
- Deflecting user

This International Standard refers to the following basic call functional entities (FEs) defined in ISO/IEC 11574:

- Call Control (CC)
- Call Control Agent (CCA)

This International Standard refers to the following basic call inter-FE relationships defined in ISO/IEC 11574:

- r1
- r2

This International Standard refers to the following basic call information flows defined in ISO/IEC 11574:

- SETUP request/indication

- SETUP response/confirmation
- CHANNEL ACKNOWLEDGE request/indication
- REPORT request/indication
- DISCONNECT request/indication
- RELEASE request/indication

This International Standard refers to the following Call Transfer functional entities (FEs) defined in ISO/IEC 13865:

- FE1
- FE2
- FE3
- FE5
- FE6
- FE7

This International Standard refers to the following Call Transfer inter-FE relationship defined in ISO/IEC 13865:

- rr

This International Standard refers to the following Call Diversion functional entities (FEs) defined in ISO/IEC 13872:

- FE3
- FE4
- FE5
- FE6

This International Standard refers to the following Call Diversion inter-FE relationship defined in ISO/IEC 13872:

- rc
- rd
- re

This International Standard refers to the following Call Diversion information flows defined in ISO/IEC 13872:

- rc-DIVERT request/indication
- rc-DIVERT response/confirmation
- re-INFORM4 request/indication

4.2 Other definitions

Additional Network Feature

a capability, over and above that of a basic service, provided by a PISN, but not directly to a PISN user
call, basic call

an instance of the use of a basic service

charged call

a call that can potentially attract charges as a result of being routed to another network

NOTE A charged call can be found to be free of charge e.g. if it remains within the PISN or is not charged for by the network to which it was routed. A PISN can treat all calls or only certain classes of calls as charged calls (e.g. based on the number of the called user).

local currency unit

the currency unit of the country in which the served user's PINX is located

served user

the charged user who is provided with advice of charge information

5 List of acronyms

ANF	Additional Network Feature
AOC	Advice of Charge
AOC-S	Advice of Charge: charging information at call set-up time
AOC-D	Advice of Charge: charging information during the call
AOC-E	Advice of Charge: charging information at the end of the call
CC	Call Control (functional entity)
CCA	Call Control Agent (functional entity)
CT	Call Transfer
DIV	Call Diversion
FE	Functional Entity
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
PSTN	Public Switched Telephone Network
SDL	Specification and Description Language
SS	Supplementary Service
TE	Terminal Equipment

6 SS-AOC-S stage 1 specification

6.1 Description

6.1.1 General description

SS-AOC-S provides the served user with information about the charging rates for its current call. This can be at the moment of call establishment or, if the request is made later, at a later moment during the call. In addition, the served user is informed if a change in charging rates takes place during the call. The information can be sent for all charged calls, or on a per call basis. The charge information given relates to the call charges incurred on the PISN by the (public) network with which the PISN interworks.

NOTE In some cases, e.g. due to off-line processing of charges, or timing considerations, the charge calculated by the user or the user's equipment based on the charging rate information provided may not precisely reflect the actual cost incurred.

The structure, contents and application of charging information are given in Annex A.

6.1.2 Qualifications on applicability to telecommunication services

SS-AOC-S is applicable to all circuit mode basic services defined in ISO/IEC 11574.

6.2 Procedures

6.2.1 Provision/withdrawal

SS-AOC-S shall either be provided after pre-arrangement with the service provider, or be generally available.

SS-AOC-S can be provided either for all charged calls automatically or on a per call basis.

Withdrawal shall be at the request of the user or for service provider reasons.

6.2.2 Normal procedures

6.2.2.1 Activation/deactivation/registration/interrogation

SS-AOC-S shall be activated on provision, and deactivated on withdrawal.

SS-AOC-S requires no registration, and interrogation is not applicable.

6.2.2.2 Invocation and operation

If SS-AOC-S is provided on a per call basis, the user shall be able to invoke this service when originating a call or at any time during a call.

If SS-AOC-S is invoked for all charged calls automatically or if the served user invokes it when originating a call, the charging information shall be provided by the PISN during call establishment. This can occur, at the latest, when the calling user is informed that the called user has accepted the call.

If the served user invokes SS-AOC-S after originating a call, but prior to release of the call, the charging information shall be provided by the PISN as soon as possible after this invocation.

When there is a change in the charging rate during a call for which SS-AOC-S has been successfully invoked, the PISN shall send information about the new charging rate to be applied for the remainder of the call.

If a call for which SS-AOC-S has been successfully invoked is free of charge, or becomes free of charge during the active phase for the remainder of the call (e.g. in case of reverse charging), the specific rate “free of charge” shall be given.

If a call for which SS-AOC-S has been successfully invoked becomes free of charge for the user during the active phase for the whole call (i.e. from the beginning of the active phase of the call), the specific rate “free of charge from the beginning” shall be given.

The structure, contents and application of charging information are given in Annex A.

6.2.3 Exceptional procedures

6.2.3.1 Activation/deactivation/registration/interrogation

Not applicable.

6.2.3.2 Invocation and operation

If a user who is not provided with SS-AOC-S on a per-call basis attempts to invoke SS-AOC-S, then the attempt shall be rejected by the PISN and the user shall be informed of the reason.

NOTE An invocation for all calls automatically may proceed successfully.

If a user attempts to invoke SS-AOC-S for a call which is not a charged call, then the attempt shall be rejected by the PISN and the user shall be informed of the reason.

If the charging information related to a call for which SS-AOC-S has been successfully invoked is not available, this shall be indicated to the served user using the specific rate “not available”.

If the PISN recognises that the information for a particular charged item is incomplete, the specific rate “not available” shall be used for that charged item.

NOTE If for any reason, no charging information is provided at all on a call for which SS-AOC-S has been successfully invoked, then the user should assume that the information is not available. The user should not assume that the call is free of charge.

6.3 Interactions with other supplementary services and ANFs

Interactions with other supplementary services and ANFs for which PISN standards were available at the time of publication of this International Standard are specified below.

6.3.1 Advice of charge: charging information during the call (AOC-D)

No interaction.

6.3.2 Advice of charge: charging information at the end of the call (AOC-E)

No interaction.

6.3.3 Calling Line Identification Presentation (CLIP)

No interaction.

6.3.4 Connected Line Identification Presentation (COLP)

No interaction.

6.3.5 Calling/Connected Line Identification restriction (CLIR)

No interaction.

6.3.6 Calling Name Identification presentation (CNIP)

No interaction.

6.3.7 Connected Name Identification Presentation (CONP)

No interaction.

6.3.8 Calling/Connected Name Identification restriction (CNIR)

No interaction.

6.3.9 Call Diversion (CFU/CFB/CFNR/CD)

If a call is subject to diversion, then the diverted call can be a charged call.

The invocation of SS-AOC-S at the time of the original call establishment by or on behalf of the calling user shall apply to the diverted call.

SS-AOC-S shall not be applicable to the diverting user.

NOTE An SS-AOC-S request by or on behalf of the calling user will be rejected if the diverting user is the charged user for the diverted call.

6.3.10 Call Interception (CINT)

If a call is subject to interception, then the intercepted call can be a charged call.

The invocation of SS-AOC-S at the time of the call establishment by or on behalf of the calling user shall apply to the intercepted call.

6.3.11 Call Intrusion (CI)

No interaction.

6.3.12 Call Offer (CO)

No interaction.

6.3.13 Call Transfer (CT)

If, prior to transfer, user A was receiving AOC-S information for the primary call, at the time of transfer, SS-AOC-S shall be stopped. If at the time of the transfer it is decided that user A will not be changed for the call prior to transfer, then the specific rate “free of charge from the beginning” shall be given to user A prior to stopping SS-AOC-S. The same applies for the secondary call if user A was receiving AOC-S information for that call.

User A shall not be allowed to invoke SS-AOC-S on a call resulting from transfer.

After transfer, SS-AOC-S may be invoked for user B (or C) either automatically or on request from the user. If user C has not answered at the time of transfer, it shall not be possible to invoke SS-AOC-S until after user C has answered. If the user for which SS-AOC-S is invoked is to be charged for the call resulting from transfer, AOC-S information in that case may contain charges incurred prior to transfer (as specific rate “flat rate”).

6.3.14 Completion of Calls to Busy Subscribers (CCBS)

If SS-AOC-S is invoked for a call and the call encounters a busy called user, then SS-AOC-S shall apply to a call resulting from the use of SS-CCBS.

6.3.15 Completion of Calls on No Reply (CCNR)

If SS-AOC-S is invoked for a call and the call fails to be answered, then SS-AOC-S shall apply to a call resulting from the use of SS-CCNR.

6.3.16 Do Not Disturb (DND)

No interaction.

6.3.17 Do Not Disturb Override (DNDO)

No interaction.

6.3.18 Path replacement (ANF-PR)

The invocation and operation of ANF-PR shall not affect the delivery of AOC-S information to the served user.

6.3.19 Recall (RE)

After recall, SS-AOC-S may be invoked for user A either automatically or on request from the user.

6.4 Interworking considerations**6.4.1 Interworking with public ISDN**

For calls to a public ISDN, the PISN shall relate the charging rate delivered to the served user of SS-AOC-S with the charges that the public ISDN will account the PISN for.

6.4.2 *Interworking with PSTN*

For calls to a PSTN, the PISN shall relate the charging rate delivered to the served user of SS-AOC-S with the charges that the PSTN will account the PISN for.

6.5 Overall SDL

Figure 1 contains the dynamic description of SS-AOC-S using the Specification and Description Language (SDL) defined in CCITT Rec. Z.100:1988. The SDL process represents the behaviour of the network in providing SS-AOC-S to a served user.

Input signals from the left and output signals to the left represent primitives from and to the calling user. Input signals from the right represent inputs from the basic call process or from an internal process.

7 SS-AOC-D stage 1 specification

7.1 Description

7.1.1 *General description*

SS-AOC-D provides the served user with cumulative charging information on its account and for its current call during the active phase of the call. The information can be sent for all charged calls, or on a per call basis. The charge information given relates to the call charges incurred on the PISN by the (public) network with which the PISN interworks.

The structure, contents and application of charging information are given in Annex B.

7.1.2 *Qualifications on applicability to telecommunication services*

SS-AOC-D is applicable to all circuit mode basic services defined in ISO/IEC 11574.

7.2 Procedures

7.2.1 *Provision/withdrawal*

SS-AOC-D shall either be provided after pre-arrangement with the service provider, or be generally available.

SS-AOC-D can be provided either for all charged calls automatically or on a per call basis.

Charging information shall be given in local currency units.

The PISN may also provide the option of delivering the charging information in charging units of the type(s) used in the country of the served user, instead of in local currency units.

Withdrawal shall be at the request of the user or for service provider reasons.

7.2.2 *Normal procedures*

7.2.2.1 *Activation/deactivation/registration/interrogation*

SS-AOC-D shall be activated on provision, and deactivated on withdrawal.

SS-AOC-D requires no registration, and interrogation is not applicable.

7.2.2.2 *Invocation and operation*

If SS-AOC-D is provided on a per call basis, the user shall be able to invoke this service when originating a call or at any time during a call.

If SS-AOC-D is provided for all charged calls automatically, it shall be invoked on behalf of the calling user when a charged call is established.

If SS-AOC-D has been successfully invoked, the PISN shall transfer charging information to the served user when an appropriate cost increment occurs.

The rate of sending information can be limited such that information is not sent more frequently than every t seconds, i.e. information is sent every t seconds, or when the increment occurs, whichever is later. The value of t is an implementation option.

If a call for which SS-AOC-D has been successfully invoked is or becomes free of charge to the served user, this shall be indicated to the served user, either by the value "0", or by "free of charge". This indication shall not be repeated periodically.

When a call for which SS-AOC-D has been successfully invoked is terminated, the overall charge for the call, even if it was free of charge, shall be sent to the served user.

The structure, contents and application of charging information are given in Annex B.

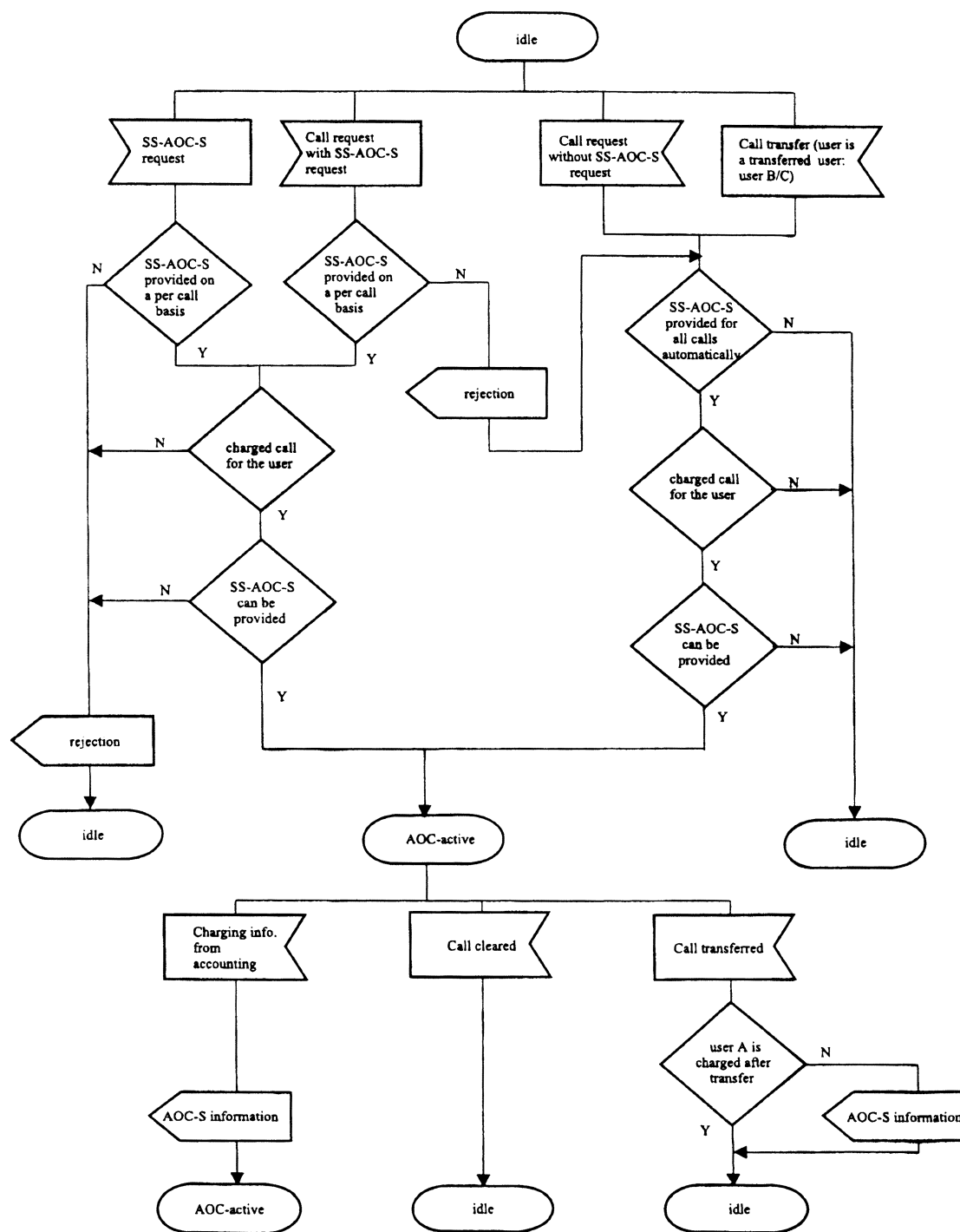


Figure 1 — SS-AOC-S, overall SDL

7.2.3 Exceptional procedures

7.2.3.1 Activation/deactivation/registration/interrogation

Not applicable.

7.2.3.2 Invocation and operation

If a user who is not provided with SS-AOC-D on a per-call basis attempts to invoke SS-AOC-D, then the attempt shall be rejected by the PISN and the user shall be informed of the reason.

NOTE An invocation for all calls automatically may proceed successfully.

If a user attempts to invoke SS-AOC-D for a call which is not a charged call, then the attempt shall be rejected by the PISN and the user shall be informed of the reason.

If the charging information related to a call for which SS-AOC-D has been successfully invoked is not available, this shall be indicated to the served user using the type of charging information “not available” and shall not be repeated periodically.

If at the end of the call, the PISN recognises that the information for a particular recorded charge is incomplete, then the recorded charge “not available” shall be included in the type of charging information relating to “total charges”.

NOTE If for any reason, no charging information is provided at all on a call for which SS-AOC-D has been successfully invoked, then the user should assume that the information is not available. The user should not assume that the call is free of charge.

7.3 Interactions with other supplementary services and ANFs

Interactions with other supplementary services and ANFs for which PISN Standards were available at the time of publication of this International Standard are specified below.

7.3.1 Advice of charge: charging information at call set-up time (AOC-S)

No interaction.

7.3.2 Advice of charge: charging information at the end of the call (AOC-E)

If both SS-AOC-D and SS-AOC-E have been invoked, when the call is terminated, no information related to SS-AOC-D shall be given.

7.3.3 Calling Line Identification Presentation (CLIP)

No interaction.

7.3.4 Connected Line Identification Presentation (COLP)

No interaction.

7.3.5 Calling/Connected Line Identification restriction (CLIR)

No interaction.

7.3.6 Calling Name Identification presentation (CNIP)

No interaction.

7.3.7 Connected Name Identification Presentation (CONP)

No interaction.

7.3.8 Calling/Connected Name Identification restriction (CNIR)

No interaction.

7.3.9 Call Diversion (CFU/CFB/CFNR/CD)

If a call is subject to diversion, then the diverted call can be a charged call.

The invocation of SS-AOC-D at the time of the original call establishment by or on behalf of the calling user A shall apply to the diverted call.

SS-AOC-D shall not be applicable to the diverting user.

NOTE An SS-AOC-D request by or on behalf of the calling user will be rejected if the diverting user is the charged user for the diverted call.

7.3.10 Call Interception (CINT)

If a call is subject to interception, then the intercepted call can be a charged call.

The invocation of SS-AOC-D at the time of the call establishment by or on behalf of the calling user shall apply to the intercepted call.

7.3.11 Call Intrusion (CI)

No interaction.

7.3.12 Call Offer (CO)

No interaction.

7.3.13 Call Transfer (CT)

If, prior to transfer, user A was receiving AOC-D information for the primary call, then at the time of transfer, the (sub)total charges shall be sent to user A and SS-AOC-D shall be stopped. If at the time of the transfer it is decided that user A will not be charged for the call prior to transfer, then the (sub)total charges sent to user A will have value "0" or "free of charge". The same applies for the secondary call if user A was receiving AOC-D information for that call.

NOTE The charges will be total charges if user A is not charged for the call resulting from transfer and sub-total charges otherwise. User A shall not be allowed to invoke SS-AOC-D on a call resulting from transfer.

After transfer SS-AOC-D may be invoked for user B (or C) either automatically or on request from the user. If user C has not answered at the time of transfer, it shall not be possible to invoke SS-AOC-D until after user C has answered. If the user for which SS-AOC-D is invoked is to be charged for the call resulting from transfer, AOC-D information in that case may contain charges incurred prior to transfer.

7.3.14 Completion of Calls to Busy Subscribers (CCBS)

If SS-AOC-D is invoked for a call and the call encounters a busy called user, then SS-AOC-D shall apply to a call resulting from the use of SS-CCBS.

7.3.15 Completion of Calls on No Reply (CCNR)

If SS-AOC-D is invoked for a call and the call fails to be answered, then SS-AOC-D shall apply to a call resulting from the use of SS-CCNR.

7.3.16 Do Not Disturb (DND)

No interaction.

7.3.17 Do Not Disturb Override (DNDO)

No interaction.

7.3.18 Path replacement (ANF-PR)

The invocation and operation of ANF-PR shall not affect the delivery of AOC-D information to the served user.

7.3.19 Recall (RE)

After recall, SS-AOC-D may be invoked for user A either automatically or on request from the user

7.4 Interworking considerations**7.4.1 Interworking with public ISDN**

For calls to a public ISDN, the PISN shall relate the cumulative charging information delivered to the served user of AOC with the charges that the public ISDN will account the PISN for.

7.4.2 Interworking with PSTN

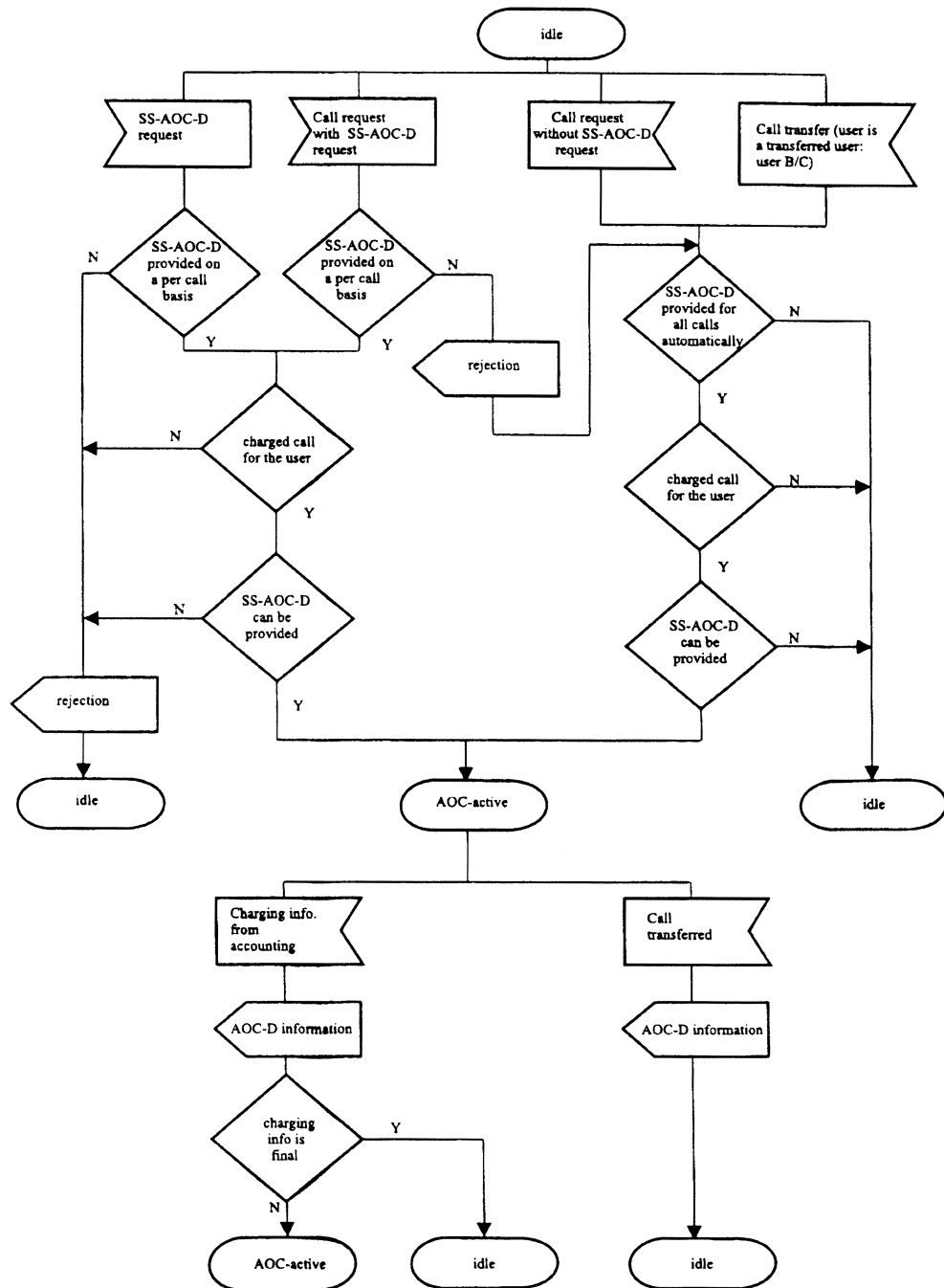
For calls to a PSTN, the PISN shall relate the cumulative charging information delivered to the served user of AOC with the charges that the PSTN will account the PISN for.

7.5 Overall SDL

Figure 2 contains the dynamic description of SS-AOC-D using the Specification and Description Language (SDL) defined in CCITT Rec. Z.100:1988. The SDL process represents the behaviour of the network in providing SS-AOC-D to a served user.

Input signals from the left and output signals to the left represent primitives from and to the calling user.

Input signals from the right represent inputs from the basic call process or from an internal process.



99-0137-A

Figure 2 — SS-AOC-D, overall SDL