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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Recall supplementary service

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseau privé à intégration de services — Protocole de signalisation d'interéchange — Service supplémentaire de rappel

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 15052 was prepared by ECMA (as ECMA-214) 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.

This second edition cancels and replaces the first edition (ISO/IEC 15052:1997), which has been technically revised.

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Introduction

This International Standard is one of a series of Standards defining services and signalling protocols applicable to Private Integrated Services Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC.

This International Standard specifies the signalling protocol for use at the Q reference point in support of the Recall supplementary service. The protocol defined in this International Standard forms part of the PSS1 protocol (informally known as QSIG).

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.

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Recall supplementary service

1 Scope

This International Standard specifies the signalling protocol for the support of Recall supplementary service (SS-RE) at the Q reference point between Private Integrated services Network eXchanges (PINXs) connected together within Private Integrated Services Network (PISN).

SS-RE is a supplementary service which provides for the re-direction of a transferred call back to the served user if the call is unanswered. SS-RE is only applicable after transfer by join, not after transfer by rerouteing.

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 ETS 300 387. 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 15051.

The signalling protocol for SS-RE 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-RE and other supplementary services and ANFs. However, the interaction with the Call Transfer supplementary service is specified as part of SS-RE signalling procedures as it is the essential aspect of the Recall supplementary service.

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 be interconnected 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-RE 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 referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11572:2000, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol*

ISO/IEC 11574:2000, *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)*

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ISO/IEC 11582:2002, *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 13865:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Call Transfer supplementary service*

ISO/IEC 13868:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Name identification supplementary services*

ISO/IEC 13869:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Transfer supplementary service*

ISO/IEC 13873:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Diversion supplementary services*

ISO/IEC 15051:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Recall supplementary service*

ISO/IEC 15054:2003, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call Interception additional network feature*

ETS 300 387:1994, *Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services*

ITU-T Rec. I.112:1993, *Vocabulary of terms for ISDNs*

ITU-T Rec. I.210:1993, *Principles of telecommunication services supported by an ISDN and the means to describe them*

ITU-T Rec. Z.100:1999, *Specification and description language (SDL)*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1 External definitions

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

- Application Protocol Data Unit (ISO/IEC 11582)
- Basic Service (ITU-T Rec. I.210)
- Call, Basic Call (ISO/IEC 11582)
- End PINX (ISO/IEC 11582)
- Gateway PINX (ISO/IEC 11572)
- Integrated Services Digital Network (ITU-T Rec. I.112)
- Interpretation APDU (ISO/IEC 11582)
- Private Integrated Services Network (PISN) (ISO/IEC 11579-1)
- Private Integrated services Network eXchange (PINX) (ISO/IEC 11579-1)
- Primary Call (ISO/IEC 13865)
- Primary PINX (ISO/IEC 13869)
- Secondary Call (ISO/IEC 13865)
- Secondary PINX (ISO/IEC 13869)
- Signalling (ITU-T Rec. I.112)
- Supplementary Service (ITU-T Rec. I.210)
- Supplementary Service Control Entity (ISO/IEC 11582)

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– User (ISO/IEC 11574)

– User B (ISO/IEC 13865)

– User C (ISO/IEC 13865)

4.2 Other definitions

4.2.1 Served user, User A

The user of the Recall service located at the Served User PINX.

4.2.2 Served User PINX

The End PINX which initiates the call transfer procedures on behalf of user A and which recalls user A in case the recall condition applies.

5 List of acronyms

APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation One
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-CT	Call Transfer supplementary service
SS-RE	Recall supplementary service

6 Signalling protocol for the support of SS-RE

6.1 SS-RE description

When the served user has a call established with user B and transfers that call to user C SS-RE enables user B to be re-connected to the served user if user C is being alerted and does not reply within a specified time, or if the call is waiting at a busy user C and remains busy for a specified time.

6.2 SS-RE operational requirements

6.2.1 Provision/withdrawal

SS-RE is provided or withdrawn after pre-arrangement with the service provider, or may be available generally to all users. SS-RE may be withdrawn on request of the user or for administrative reasons.

6.2.2 Requirements on the Primary PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

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

6.2.3 Requirements on the Served User PINX

The basic call procedures specified in ISO/IEC 11572 shall be supported.

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

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6.3 SS-RE coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply. The notation is in accordance with ITU-T Rec. X.680 and X.690. The ITU-T Rec. X.208 and X.209 superseded version is in annex D.

Table 1 - Operations in Support of SS-RE

```
Recall-Operations-asn1-97
        { iso (1) standard (0) pss1-recall (15052) recall-operations-asn1-97 (1) }

DEFINITIONS EXPLICIT TAGS ::=

BEGIN

IMPORTS
        OPERATION, ERROR FROM Remote-Operations-Information-Objects
        { joint-iso-itu-t (2) remote-operations (4) informationObjects (5) version1(0) }

        EXTENSION, Extension{} FROM Manufacturer-specific-service-extension-class-asn1-97
        { iso (1) standard (0) pss1-generic-procedures (11582) msi-class-asn1-97 (11) }

        Name FROM Name-Operations-asn1-97
        { iso (1) standard (0) pss1-name (13868) name-operations-asn1-97 (1) }

        PresentedNumberScreened, PartySubaddress FROM Addressing-Data-Elements-asn1-97
        { iso (1) standard (0) pss1-generic-procedures (11582) addressing-data-elements-asn1-97 (20) };

Recall-Operations OPERATION ::= { recallAlerting | recallAnswered }


recallAlerting    OPERATION    ::= {
                  -- Sent from the Served User PINX to the Primary PINX
                  ARGUMENT             ReAlertingArg
                  RETURN RESULT        FALSE
                  ALWAYS RESPONDS      FALSE
                  CODE                 local: 57}


recallAnswered OPERATION ::= {
                        -- Sent from the Served User PINX to the Primary PINX
                        ARGUMENT ReAnswerArg
                        RETURN RESULT        FALSE
                        ALWAYS RESPONDS      FALSE
                        CODE                 local: 58}

ReAlertingArg           ::= SEQUENCE {
            alertedNumber               [1] PresentedNumberScreened OPTIONAL,
            alertedName         [2] Name OPTIONAL,
            argumentExtension           CHOICE {
                                extension               [6] IMPLICIT Extension{{REExtSet}},
                                multipleExtension       [7] IMPLICIT SEQUENCE OF Extension{{REExtSet}}
                                } OPTIONAL  }
```


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

```
ReAnswerArg             ::= SEQUENCE {
        connectedNumber             [1] PresentedNumberScreened,
        connectedSubaddress         [2] PartySubaddress OPTIONAL,
        connectedName               [3] Name OPTIONAL,
        argumentExtension           CHOICE {
                extension                   [6] IMPLICIT Extension{{REExtSet}},
                multipleExtension           [7] IMPLICIT SEQUENCE OF Extension{{REExtSet}}
                                            } OPTIONAL  }

REExtSet EXTENSION ::= {…}

END     -- of Recall-Operations-asn1-97
```

6.3.2 Information elements

6.3.2.1 Facility information element

The operations defined in 6.3.1 shall be coded in the Facility information element in accordance with ISO/IEC 11582.

When conveying the invoke APDU of the operations defined in 6.3.1, the destinationEntity data element of the NFE shall contain value endPINX and the Interpretation APDU shall contain value discardAnyUnrecognisedInvokePdu.

6.3.3 Messages

The Facility information element shall be conveyed in the messages as specified in clause 10 of ISO/IEC 11582.

6.4 SS-RE State definitions

6.4.1 States at the Served User PINX

The procedures for the Served User PINX are written in terms of the following conceptual states existing within the SS-RE Supplementary Service Control entity.

6.4.1.1 RE-Idle

SS-RE is not operating at the Served User PINX.

6.4.1.2 RE-Await-Answer-From-User-A

The recall to user A has been initiated by the Served User PINX.

6.4.2 States at the Primary PINX

The procedures for the Primary PINX are written in terms of the following conceptual states existing within the SS-RE Supplementary Service Control entity in that PINX in association with a particular call:

6.4.2.1 RE-Idle-P

SS-RE is not operating at the Primary PINX.

6.5 SS-RE signalling procedures

An example message sequence is shown in annex B.

NOTE - The specification in this section is based on each of the End PINXs involved in SS-CT being a different PINX, but this section is also applicable to scenarios where two of the three PINXs are the same. In those scenarios some of the signalling procedures and message flows described in this are internal to the PINX implementation and therefore outside the scope of this International Standard.

6.5.1 Actions at the Served User PINX

6.5.1.1 Normal procedures

NOTE - It is assumed that SS-CT has been invoked successfully before the procedures of SS-RE are started and user C has not answered the call.

When recall to user A occurs, the Served User PINX shall enter state RE-Await-Answer-From-User-A and initiate clearing of the secondary call according to the procedures of ISO/IEC 11572 either immediately or when alerting of user A starts.

In state RE-Await-Answer-From-User-A, the Served User PINX shall send a FACILITY message with a recallAlerting invoke APDU to the Primary PINX when alerting of user A commences and a recallAnswered invoke APDU when user A answers the

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call. The argument of the recallAlerting invoke APDU may contain the elements alertedNumber and/or alertedName if it is known that presentation restriction does not apply. The argument of recallAnswered invoke APDU may contain connectedSubaddress or connectedName.

The Served User PINX shall enter state RE-Idle after the recallAnswered invoke APDU has been sent or when the call is cleared.

6.5.1.2 Exceptional procedures

If the recall to user A cannot be completed due to e.g. user A does not answer the call, additional implementation specific procedures may be provided by the Served User PINX.

6.5.2 Actions at the Primary PINX

6.5.2.1 Normal procedures

NOTE - It is assumed that SS-CT has been invoked successfully before the procedures of SS-RE are started.

On receipt of a recallAlerting invoke APDU or a recallAnswered invoke APDU in a FACILITY message from the Served User PINX, the Primary PINX shall remain in state RE-Idle-P and convey appropriate alerting or answer notifications to user B. The received number information may be conveyed by the Primary PINX to the user subject to number presentation restriction.

If element connectedName or alertedName is present, the received name information may be conveyed by the Primary PINX to the user subject to name presentation restriction. Any other information in the invoke APDU may be conveyed to the user.

6.5.2.2 Exceptional procedures

Not applicable.

6.6 SS-RE Impact of interworking with public ISDNs

When user A is in the PISN, and user B is in the public ISDN, the Gateway PINX shall convey the notifications of recall to the public ISDN by mapping the recallAlerting invoke APDU and recallAnswered invoke APDU received from the Served User PINX to equivalent indications towards the public ISDN, if the public ISDN is capable of receiving it.

When user A is in the public ISDN, and user B is in the PISN, the Gateway PINX shall convey any recall notifications received from the public ISDN to the Primary PINX by mapping them accordingly to the recallAlerting invoke APDU and recallAnswered invoke APDU.

NOTE - At the time of publication of this International Standard, no equivalent service was specified for public ISDNs.

6.7 SS-RE Impact of interworking with non-ISDNs

When user A is in the PISN, and user B is in the other network, the Gateway PINX shall convey the notifications of recall to the other network by mapping the recallAlerting invoke APDU and recallAnswered invoke APDU received from the Served User PINX to equivalent indications towards the other network, if the other network is capable of receiving it.

When user A is in the other network, and user B is in the PISN, the Gateway PINX shall convey any recall notifications received from the other network to the Primary PINX by mapping them accordingly to the recallAlerting invoke APDU and recallAnswered invoke APDU.

6.8 SS-RE Parameter values (Timers)

Not applicable.

6.9 Protocol interactions between SS-RE and other supplementary services and ANFs

This clause specifies protocol interactions with other supplementary services and ANFs for which stage 3 standards had been published at the time of publication of this International Standard. For interactions with supplementary services and ANFs for which stage 3 standards are published subsequent to the publication of this International Standard, see those other stage 3 standards.

NOTE - Simultaneous conveyance of APDUs for SS-RE and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 Standard, does not, on its own, constitute a protocol interaction.

6.9.1 Interaction with Calling Name Identification Presentation (SS-CNIP)

No interaction.

6.9.2 Interaction with Connected Name Identification Presentation (SS-CONP)

Provision of the connected name to the calling user following recall is specified in 6.5.2.1.

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6.9.3 Interaction with Call Forwarding Unconditional (SS-CFU)

The following interaction shall apply if SS-CFU is supported in accordance with ISO/IEC 13873.

6.9.3.1 Actions at the SS-RE Served User PINX

If SS-CFU is invoked, no divertingLegInformation1 or divertingLegInformation3 invoke APDU shall be sent to the Primary PINX.

When sending a recallAlerting or recallAnswered invoke APDU, the information in the argument shall relate to the diverted-to user instead of to user A.

On receipt of a callRerouteing invoke APDU during invocation of recall, the Served User PINX shall act as the Rerouteing PINX.

6.9.4 Interaction with Call Forwarding Busy (SS-CFB)

The following interaction shall apply if SS-CFB is supported in accordance with ISO/IEC 13873.

6.9.3.1 shall apply with "CFU" replaced by "CFB".

6.9.5 Interaction with Call Forwarding No Reply (SS-CFNR)

The following interaction shall apply if SS-CFNR is supported in accordance with ISO/IEC 13873.

6.9.5.1 Actions at a SS-RE Served User PINX for join

In state RE-Await-Answer-From-User-A, the SS-RE Served User PINX shall convey any received divertingLegInformation1 invoke APDU or divertingLegInformation3 invoke APDU to the Primary PINX.

When the diverted-to user answers, the actions shall be as specified in 6.5.1.1 when user A answers.

In state RE-Await-Answer-From-User-A, on receipt of a callRerouting invoke APDU, the SS-RE Served User PINX shall act as the Rerouteing PINX. Any divertingLegInformation1 invoke APDUs or divertingLegInformation3 invoke APDUs generated in accordance with Rerouteing PINX procedures shall be sent to the Primary PINX.

6.9.5.2 Actions at a Primary PINX

The actions at an Originating PINX in 6.5.1.1 and 6.5.1.2 of ISO/IEC 13873 shall apply also to the Primary PINX with the following exceptions:

– The basic call protocol control state in which a divertingLegInformation1 invoke APDU can be received is "Active".

– On receipt of a recallAnswered invoke APDU, the Primary PINX shall enter state CFO-Idle.

6.9.6 Interaction with Call Transfer (SS-CT)

Interactions are specified in clauses 6.1 to 6.8.

6.9.7 Interaction with Path Replacement (ANF-PR)

No interaction.

6.9.8 Interaction with Call Completion to Busy Subscriber (SS-CCBS)

No interaction.

6.9.9 Interaction with Call Completion on No Reply (SS-CCNR)

No interaction.

6.9.10 Interaction with Call Offer (SS-CO)

No interaction.

6.9.11 Interaction with Do Not Disturb (SS-DND)

No interaction.

6.9.12 Interaction with Do Not Disturb Override (SS-DNDO)

No interaction.

6.9.13 Interaction with Call Intrusion (SS-CI)

No interaction.

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6.9.14 Interaction with Advice of Charge (SS-AOC)

No interaction.

6.9.15 Interactions with Call Interception delayed (ANF-CINT)

The following interaction shall apply if ANF-CINT is supported in accordance with ISO/IEC 15054.

6.9.15.1 Actions at a SS-RE Served User PINX

If recall fails or remains unanswered and if call interception is invoked, any cintLegInformation1, divertingLegInformation3, cintDisable or cintEnable invoke APDUs generated or received in accordance with ANF-CINT procedures shall be sent to the SS-RE Primary PINX.

6.9.15.2 Actions at a SS-RE Primary PINX

The actions at an ANF-CINT Originating PINX specified in 6.6.3 of ISO/IEC 15054 shall apply also to the SS-RE Primary PINX.

NOTE - The basic call protocol control state in which a cintLegInformation1, divertingLegInformation3, cintEnable or cintDisable invoke APDU can be received is “active”.

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Annex A
(normative)

Protocol Implementation Conformance Statement (PICS) proforma

A.1 Introduction

The supplier of a protocol implementation which is claimed to conform to this International Standard shall complete the Protocol Implementation Conformance Statement (PICS) proforma in clause A.3.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use:

- by a protocol implementor, as a check list to reduce the risk of failure to conform to the Standard through oversight;
- by the supplier and acquirer (or potential acquirer) of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the Standard PICS proforma;
- by the user (or potential user) of the implementation, as a basis for initially checking the possibility of interworking with another implementation (note that, while interworking can not be guaranteed, failure to interwork can often be predicted from incompatible PICSs);
- by a protocol tester, as the basis for selecting appropriate tests against which to asses the claim for conformance of the implementation.

A.2 Instructions for completing the PICS proforma

A.2.1 General structure of the PICS proforma

The PICS proforma is a fixed format questionnaire divided into subclauses each containing a group of individual items. Each item is identified by an item number, the name of the item (question to be answered) and the reference(s) to the clause(s) that specifies (specify) the item in the main body of this International Standard.

The "Status" column indicates whether an item is applicable and if so whether support is mandatory or optional. The following terms are used:

m	mandatory (the capability is required for conformance to the protocol);
o	optional (the capability is not required for conformance to the protocol, but if the capability is implemented, it is required to conform to the protocol specifications);
o.<n>	optional, but support of at least one of the group of options labelled by the same numeral <n> is required;
x	prohibited;
c.<cond>	conditional requirement, depending on support for the item or items listed in condition <cond>;
<item>:m	simple conditional requirement, the capability being mandatory if item number <item> is supported, otherwise not applicable;
item>:o	simple conditional requirement, the capability being optional if item number <item> is supported, otherwise not applicable.

Answers to the questionnaire items are to be provided either in the "Support" column, by simply marking an answer to indicate a restricted choice (Yes or No) or in the "Not Applicable" column (N/A).

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A.2.2 Additional information

Items of Additional Information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intended or expected that a large quantity will be supplied, and a PICS can be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations.

References to items of Additional Information may be entered next to any answer in the questionnaire, and may be included in items of Exception information.

A.2.3 Exception information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirements. No pre-printed answer will be found in the Support column for this. Instead, the supplier is required to write into the support column an x.<i> reference to an item of Exception Information, and to provide the appropriate rationale in the Exception item itself.

An implementation for which an Exception item is required in this way does not conform to this International Standard. A possible reason for the situation described above is that a defect in the Standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

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A.3 PICS proforma for ISO/IEC 15052

A.3.1 Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation name(s) and version(s)	
Other information necessary for full identification, e.g. name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

The terms Name and Version should be interpreted appropriately to correspond with a suppliers terminology (e.g. Type, Series, Model).

A.3.2 Protocol summary

Protocol version	1.0
Addenda Implemented (if applicable)	
Amendments Implemented	
Have any exception items been required (see A.2.3)?	No [ ] Yes [ ] (The answer Yes means that the implementation does not conform to this International Standard)

Date of Statement	

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A.3.3 General

Item	Question/feature	Reference	Status	N/A	Support
A1	Support of SS-RE in Served User PINX		o.1		Yes [ ] No [ ]
A2	Support of SS-RE in Primary PINX		o.1		Yes [ ] No [ ]
A3	Support of SS-CT (transfer by join)		A1:m	[ ]	m: Yes [ ]
A4	Support of SS-RE in Gateway PINX to public ISDNs		o		Yes [ ] No [ ]
A5	Support of SS-RE in Gateway PINX to non-ISDNs		o		Yes [ ] No [ ]

A.3.4 Procedures for SS-RE

Item	Question/feature	Reference	Status	N/A	Support
B1	Support of ISO/IEC 11572 and ISO/IEC 11582 procedures at a Served User PINX	6.2.3	A1:m	[ ]	m: Yes [ ]
B2	Support of ISO/IEC 11572 and ISO/IEC 11582 procedures at a Primary PINX	6.2.2	A2:m	[ ]	m: Yes [ ]
B3	Signalling procedures at a Served User PINX	6.5.1	A1:m	[ ]	m: Yes [ ]
B4	Signalling procedures at a Primary PINX	6.5.2	A2:m	[ ]	m: Yes [ ]
B5	Behaviour as Gateway for interworking with public ISDNs	6.6	A4:m	[ ]	m: Yes [ ]
B6	Behaviour as Gateway for interworking with non-ISDNs	6.7	A5:m	[ ]	m: Yes [ ]

A.3.5 Coding

Item	Question/feature	Reference	Status	N/A	Support
C1	Sending of recallAlerting invoke APDU in Served User PINX	6.3	A1:m	[ ]	m: Yes [ ]
C2	Receipt of recallAlerting invoke APDU in Primary User PINX	6.3	A2:m	[ ]	m: Yes [ ]
C3	Sending of recallAnswered invoke APDU in Served User PINX	6.3	A1:m	[ ]	m: Yes [ ]
C4	Receipt of recallAnswered invoke APDU in Primary PINX	6.3	A2:m	[ ]	m: Yes [ ]

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A.3.6 Interactions between SS-RE and SS-CFU

Item	Question/feature	Reference	Status	N/A	Support
D1	Support of SS-CFU (Rerouteing PINX)		o		Yes [ ] No [ ]
D2	Actions at the SS-RE Served User PINX	6.9.3	c.1	[ ]	m: Yes [ ]

c.1: if A1 and D1 then mandatory, else N/A

A.3.7 Interactions between SS-RE and SS-CFB

Item	Question/feature	Reference	Status	N/A	Support
E1	Support of SS-CFB (Rerouteing PINX)		o		Yes [ ] No [ ]
E2	Actions at the SS-RE Served User PINX	6.9.4	c.1	[ ]	m: Yes [ ]

c.1: if A1 and E1 then mandatory, else N/A

A.3.8 Interactions between SS-RE and SS-CFNR

Item	Question/feature	Reference	Status	N/A	Support
F1	Support of SS-CFNR (Rerouteing PINX)		o		Yes [ ] No [ ]
F2	Support of SS-CFNR (Originating PINX)		o		Yes [ ] No [ ]
F3	Actions at the SS-RE Served User PINX	6.9.5.1	c.1	[ ]	m: Yes [ ]
F4	Actions at a Primary PINX	6.9.5.2	c.2	[ ]	m: Yes [ ]

c.1: if A1 and F1 then mandatory, else N/A

c.2: if A2 and F2 then mandatory, else N/A

A.3.9 Interactions between SS-RE and ANF-CINT

Item	Question/feature	Reference	Status	N/A	Support
G1	Support of ANF-CINT (delayed)		o		Yes [ ] No [ ]
G2	Interaction at a SS-RE Served User PINX	6.9.15.1	G1:m	[ ]	m: Yes [ ]
G3	Interaction at a SS-RE Primary PINX	6.9.15.2	c.1	[ ]	m: Yes [ ]

c.1: if G1 and (A3 or A4) then m else N/A

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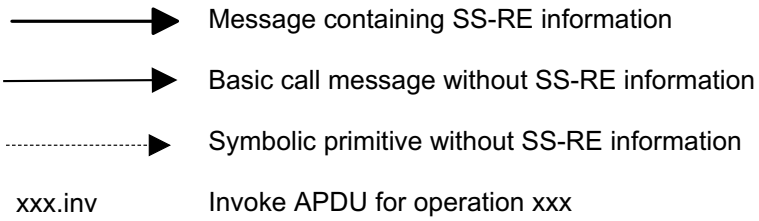
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Annex B
(informative)

Example of message sequences

This annex describes a typical message flow of SS-RE. The following conventions are used in the figure of this annex.

1. The following notation is used:



2. The figure show messages exchanged via Protocol Control between PINXs involved in SS-RE. Only messages relevant to SS-RE are shown.
3. Only the relevant information content (i.e. remote operation APDUs) is listed below each message name. The Facility information elements containing remote operation APDUs are not explicitly shown. Information with no impact on SS-RE is not shown.

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B.1 Message sequence for SS-RE

Figure B.1.1 shows the successful invocation of SS-RE with alert and answer indications.

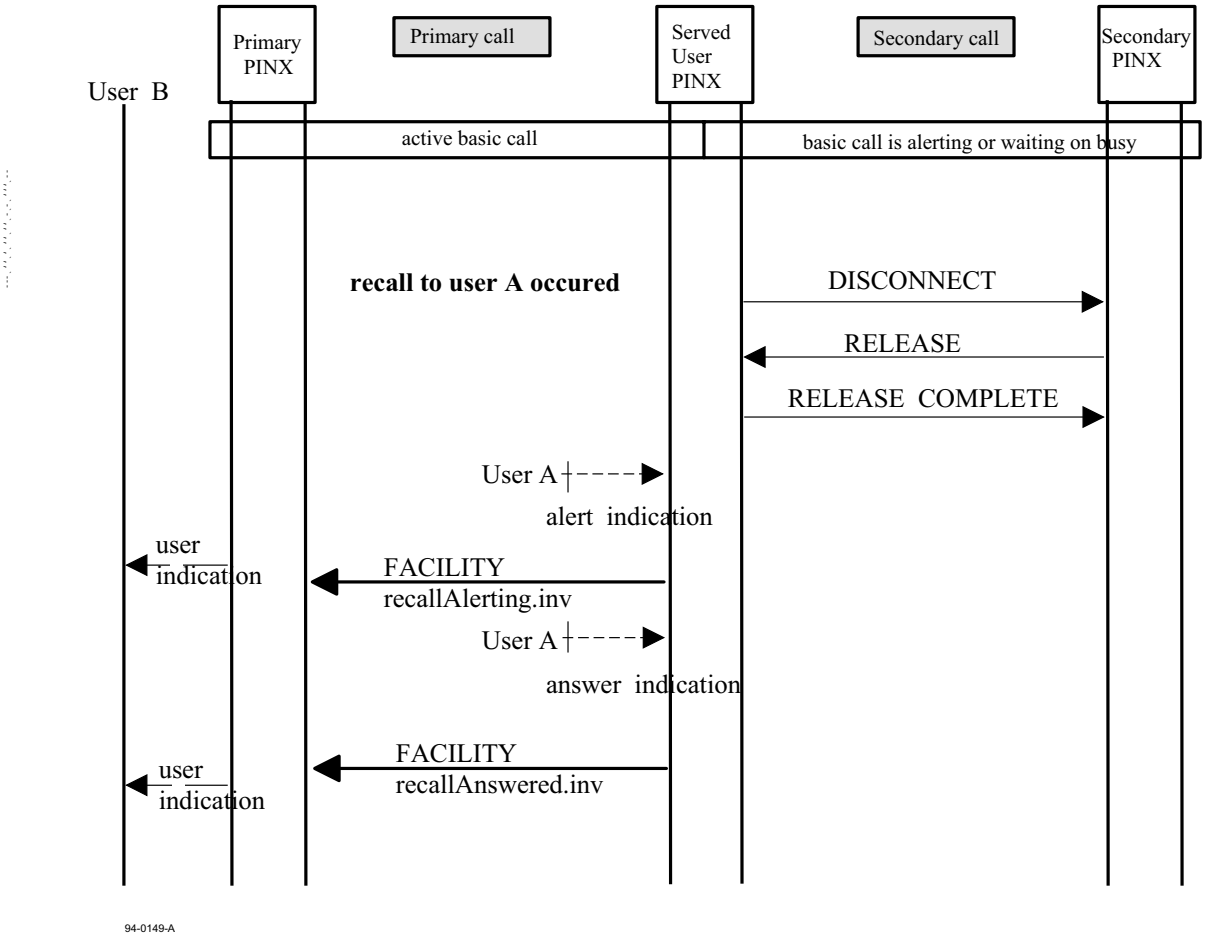


Figure B.1.1 - Successful invocation of SS-RE

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Annex C
(informative)

Specification and Description Language (SDL)
Representation of procedures

The diagrams in this annex use the Specification and Description Language defined in ITU-T Recommendation Z.100 (1999).

Each diagram represents the behaviour of an SS-RE Supplementary Service Control entity at a particular type of PINX. In accordance with the protocol model described in ISO/IEC 11582, the Supplementary Service Control entity uses, via the Coordination Function, the services of Generic Functional Procedures Control and Basic Call Control.

Where an output symbol represents a primitive to the Coordination Function, and that primitive results in a QSIG message being sent, the output bears the name of the message and any remote operations APDU(s) or notification(s) contained in that message. In case of a message specified in ISO/IEC 11572, basic call actions associated with the sending of that message are deemed to occur.

Where an input symbol represents a primitive from the Coordination Function and that primitive is the result of a QSIG message being received, the input signal bears the name of the message and any remote operation APDU(s) or notification(s) contained in that message. In case of a message specified in ISO/IEC 11572, basic call actions associated with the receipt of that message are deemed to have occurred.

The following abbreviations are used:

inv invoke APDU

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C.1 SDL Representation of SS-RE at the Served User PINX

Figure C.1 shows the behavior of an SS-RE Supplementary Service Control entity within the Served User PINX.

Input signals from the right and output signals to the right represent primitives from and to the Coordination Function in respect of messages being received and sent or internal primitives.

Input signals from the left represent primitives between the SS-RE Supplementary Service Control entity and the served user.

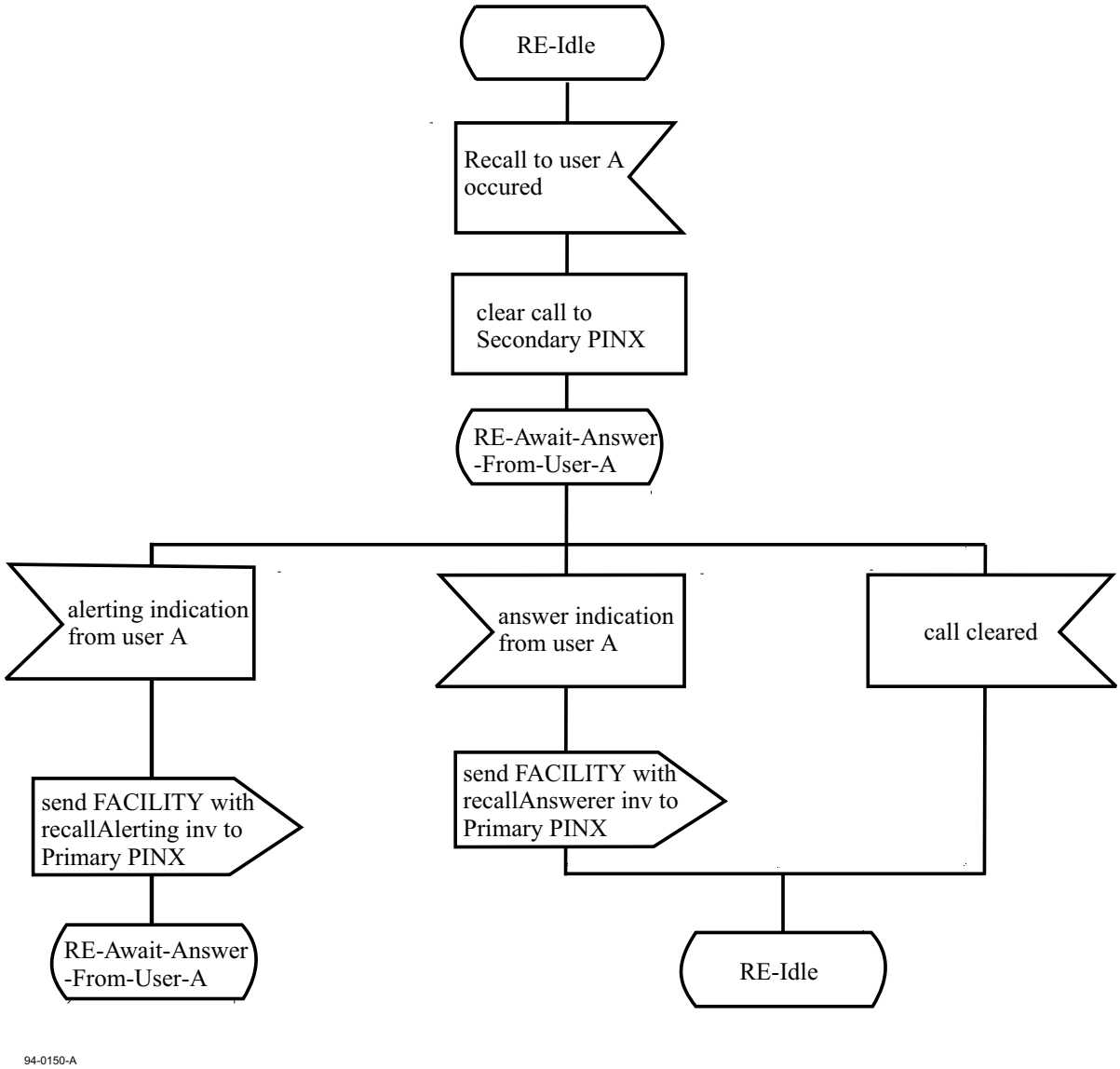


Figure C.1 - SDL for Served User PINX

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C.2 SDL Representation of SS-RE at the Primary PINX

Figure C.2 shows the behavior of an SS-RE Supplementary Service Control entity within the Primary PINX.

Input signals from the right represent primitives from the Coordination Function in respect of the messages being received.

Outputs signals to the left represent primitives between the SS-RE Supplementary Service Control entity and the primary user.

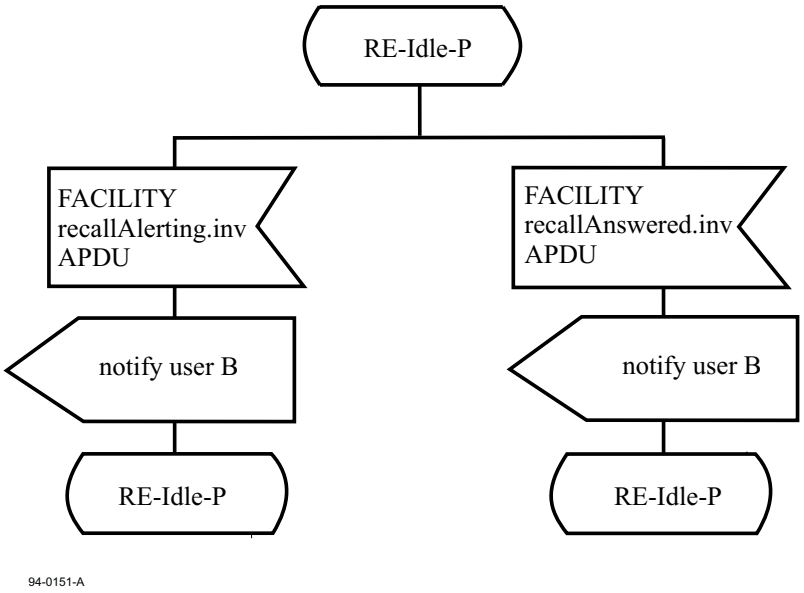


Figure C.2 - SDL for Primary PINX

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Annex D
(normative)

ASN.1 definitions according to ITU-T Recs. X.208 / X.209

This annex lists all ASN.1 modules as they were defined in the first edition of ISO/IEC 15052, i.e. based on ITU-T Recommendations X.208 / X.209. Starting with this edition the ASN.1 modules within ISO/IEC 15052 comply with ITU-T Recommendations X.680 / X.690. Please note that regardless of which version of these modules is used as a base of a QSIG implementation, the line encoding remains unchanged. Changes in future editions to modules based on X.680 / X.690 ASN.1 are not reflected in the modules in this annex.

Table D.1 - Recall-Operations – based on ITU-T Recs. X.208 / X.209

```
Recall-Operations
        { iso (1) standard (0) pss1-recall (15052) recall-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) }

                PSS1InformationElement FROM Generic-parameters-definition
                        { iso (1) standard (0) pss1-generic-procedures (11582) pss1-generic-parameters (6) }

                Name FROM Name-Operations
                        { iso (1) standard (0) pss1-name (13868) name-operations (0) }

                PresentedNumberScreened, PartySubaddress FROM Addressing-Data-Elements
                 { iso (1) standard (0) pss1-generic-procedures (11582) addressing-data-elements (9) };

RecallAlerting          ::= OPERATION
        -- Sent from the Served User PINX to the Primary PINX
           ARGUMENT ReAlertingArg


RecallAnswered          ::= OPERATION
        -- Sent from the Served User PINX to the Primary PINX
           ARGUMENT ReAnswerArg

ReAlertingArg           ::= SEQUENCE {
           alertedNumber                [1] PresentedNumberScreened OPTIONAL,
           alertedName          [2] Name OPTIONAL,
           argumentExtension            CHOICE {
                                        extension               [6] IMPLICIT Extension,
                                        multipleExtension       [7] IMPLICIT SEQUENCE OF Extension
                                        } OPTIONAL  }
```

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Table D.1 - Recall-Operations – based on ITU-T Recs. X.208 / X.209 (concluded)

```
ReAnswerArg             ::= SEQUENCE {
        connectedNumber             [1] PresentedNumberScreened,
        connectedSubaddress         [2] PartySubaddress OPTIONAL,
        connectedName               [3] Name OPTIONAL,
        argumentExtension           CHOICE {
                extension                   [6] IMPLICIT Extension,
                multipleExtension           [7] IMPLICIT SEQUENCE OF Extension
                                            } OPTIONAL  }

recallAlerting          RecallAlerting      ::= localValue 57
recallAnswered          RecallAnswered      ::= localValue 58

END     -- of Recall-Operations
```


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