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Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is a multi-part standard and will consist of the following parts:

- Part 1: "General network design".
- Part 2: "Air Interface (AI)".
- Part 3: "Inter-working", (DE/RES-06001-3).
- Part 4: "Gateways", (DE/RES-06001-4).
- Part 5: "Terminal equipment interface", (DE/RES-06001-5).
- Part 6: "Line connected stations", (DE/RES-06001-6).
- Part 7: "Security".
- Part 8: "Management services", (DE/RES-06001-8).
- Part 9: "Performance objectives", (DE/RES-06001-9).
- Part 10: "Supplementary services stage 1".**
- Part 11: "Supplementary services stage 2", (DE/RES-06001-11).
- Part 12: "Supplementary services stage 3", (DE/RES-06001-12).
- Part 13: "SDL Model of the Air Interface", (DE/RES-06001-13).
- Part 14: "PICS Proforma", (DE/RES-06001-14).
- Part 15: "Inter-working - Extended Operations", (DE/RES-06001-15).
- Part 16: "Gateways for Supplementary Services", (DE/RES-06001-16).

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Date of adoption of this ETS:	1 March 1996
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1 Scope

This European Telecommunication Standard (ETS) defines the stage 1 specifications of the Include Call (IC) supplementary service for the Trans-European Trunked RAdio (TETRA) as provided by European operators. Stage 1 is an overall service description from the users point of view but does not deal with the details of the human interface itself.

This ETS specifies the service description of the supplementary service and the procedures to be expected with successful and unsuccessful outcomes. In addition the ETS specifies the interactions with other TETRA supplementary services and inter-working considerations.

Charging principles are outside the scope of this ETS.

The IC supplementary service enables the served user, while having a call in progress, to make a new call and have the new party included in the original call.

This ETS applies to TETRA speech teleservices and speech bearer services only.

2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [2] ITU-T Recommendation X.25 (1993): "Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".
- [3] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

bearer service: A type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces.

call owner: The individual user who controls a multipoint call and is able to clear it down. It is normally the user who has originally set up the multipoint call or has obtained the control following a successful SS-TC invocation.

resulting call: The call resulting from the inclusion of the second call in the original call.

second call: The call originated by the served user after invocation of the IC supplementary service, to be included in the original call.

Supplementary Service (SS): A supplementary service modifies or supplements a bearer service or a teleservice. A supplementary service cannot be offered to a customer as a stand alone service. It should be offered in combination with a bearer service or a teleservice.

Switching and Management Infrastructure (SwMI): All of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals. The SwMI enables subscriber terminals to communicate with each other via the SwMI.

teleservice: A type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols.

(served) user A: The specific (individual) user who invokes the supplementary service. If the original call is a multipoint call, only the call owner of the original call is allowed to invoke the IC supplementary service.

user B: The other party in the original call. It can be either an individual user (the called party in an individual call) or a group of users (if the original call is a multipoint call).

user C: The other party in the second call. It can be either an individual user (the called party in an individual call) or a group of users (if the second call is a multipoint call).

3.2 Abbreviations

3.2.1 General abbreviations

For the purposes of this ETS, the following general abbreviations apply:

ISDN	Integrated Services Digital Network
SDL	(Functional) Specification and Description Language
SS	Supplementary Service

NOTE: The abbreviation SS is only used when referring to a specific supplementary service.

SwMI	Switching and Management Infrastructure
TETRA	Trans-European Trunked RAdio

3.2.2 Supplementary service abbreviations

For the purposes of this ETS, the following Supplementary Service abbreviations apply:

AL	Ambience Listening
AP	Access Priority
AS	Area Selection
BIC	Barring of Incoming Calls
BOC	Barring of Outgoing Calls
CAD	Call Authorized by Dispatcher
CCBS	Call Completion to Busy Subscriber
CCNRy	Call Completion on No reply
CRT	Call Retention
CW	Call Waiting
DGNA	Dynamic Group Number Assignment
DL	Discreet Listening
HOLD	Call Hold
IC	Include Call
LE	Late Entry
LSC	List Search Call
PC	Priority Call
PPC	Pre-emptive Priority Call
SNA	Short Number Addressing
TC	Transfer of Control of Call

4 Conformance

Not applicable.

5 SS-IC stage 1 specification

5.1 Description

5.1.1 General description

Include call is a supplementary service which enables a served user A, while being involved in an active call (original call) with user B, to make a second call to user C and have this new party included in the original call.

5.1.2 Qualifications on applicability to telecommunication services

This supplementary service is applicable to TETRA speech teleservices and to TETRA speech bearer services.

5.2 Procedures

5.2.1 Provision/Withdrawal

SS-IC may be provided after pre-arrangement with the service provider (by means of service profile control), or may be available generally to all users. SS-IC may be withdrawn on request of the user or for administrative reasons. Possible limitations (e.g. maximum number of successive invocations of SS-IC) shall be an implementation matter.

5.2.2 Normal procedures

5.2.2.1 Activation/Deactivation, Definition, Registration, Interrogation, Cancellation

SS-IC shall be permanently activated by the service provider as a result of the provision. SS-IC shall be deactivated by the service provider as a result of withdrawal. No information needs to be registered by the Switching and Management Infrastructure (SwMI) for this supplementary service.

5.2.2.1.1 Definition

Shall not be applicable.

5.2.2.1.2 Registration

Shall not be applicable.

5.2.2.1.3 Interrogation

The infrastructure may provide interrogation. If interrogation is provided, a SwMI shall support interrogation on a per number basis for example:

- activated state of the supplementary service.

5.2.2.1.4 Cancellation

User A can interrupt SS-IC operation before completion using an appropriate control procedure.

5.2.2.2 Invocation and operation

SS-IC shall be invoked by the served user A.

The served user A is initially involved in an active call (original call) with user B. If the original call is an individual call, any of the two parties may invoke SS-IC. If the original call is a multipoint call, user A shall

be the call owner of the original call. When user A invokes SS-IC to an individual user C, the SwMI shall include him into the ongoing call as soon as user C has responded positively. When user A invokes SS-IC to a user Group C, the SwMI shall immediately include the user Group C into the ongoing call. SS-IC invocation shall not produce any interruption in the original service.

The resulting call is considered as a multipoint call, whatever the nature of the original call may be. The precise nature of the resulting call is as shown in table 1.

Table 1: Nature of resulting call

Second call	Original call			
	Individual call	Group call	Acknowledged group call	Broadcast call
Individual Call	Acknowledged Group Call	Group Call	Acknowledged Group Call	Broadcast Call
Group Call	Group Call	Group Call	Group Call	Broadcast Call
Acknowledged Group Call	Acknowledged Group Call	Group Call	Acknowledged Group Call	Broadcast Call
Broadcast Call	Not Allowed	Not Allowed	Not Allowed	Broadcast Call

As an alternative the individual call may be put on Call Hold (HOLD), following the same procedure as in SS-HOLD prior to SS-IC invocation. Then user A sets up a new call to user C. User A may now merge the second call into the original call on HOLD, which now becomes active.

All concerned users should be informed by the SwMI about the state of their calls whenever necessary. In particular the establishment of the resulting call should be notified to all users involved, with an indication that a new multipoint call has been formed.

A particular request for the service may fail after invocation for one of the following reasons:

- the second call cannot reach the active state (e.g. user C is busy; not reachable, no reply, or barring/restriction conditions are encountered); or
- user B disconnects from the original call after user A has invoked SS-IC but before the resulting call is established (in such a case the original call should be cleared and the second call should be normally established).

In some of the above situations, the request may be automatically cancelled by the SwMI. In that case user A shall be notified. However, this is not mandatory.

5.2.3 Exceptional procedures

5.2.3.1 Activation/Deactivation, Definition, Registration, Interrogation, Cancellation

4.2.3.1.1 Activation/Deactivation

Shall not be applicable.

4.2.3.1.2 Definition

Shall not be applicable.

4.2.3.1.3 Registration

Shall not be applicable.

4.2.3.1.4 Interrogation

If the SwMI cannot accept an interrogation request, the interrogating user shall receive a notification that a Barring of Outgoing Calls (BOC) interrogation was unsuccessful. Possible causes for rejection are:

- insufficient information.

4.2.3.1.5 Cancellation

Shall not be applicable.

5.2.3.2 Invocation and operation

5.2.3.2.1 Rejection of SS-IC service request

If user A is not permitted to request SS-IC, the SwMI shall reject the SS-IC request with an indication of whether denial is short or long term. Rejection of SS-IC service request shall not affect the normal operation of the original call.

Short term denial shall be used for temporary conditions where a later request for SS-IC might be successful. Examples of conditions that may result in a short term denial are:

- maximum number of successive SS-IC requests already reached;
- user A is not the call owner of the original call; or
- basic service of the original call or of the second call incompatible with SS-IC or incompatible between themselves.

Long term denial shall be used when later requests shall also be rejected. Example of conditions that may result in a long term denial are:

- SS-IC not provided to user A; or
- inter-working with a network which does not support SS-IC.

5.3 Interactions with other supplementary services

Interactions with other TETRA supplementary services are specified below.

5.3.1 Calling line identification presentation

Include call shall not have any interaction with calling line identification presentation.

5.3.2 Connected line identification presentation

User B shall not receive the identification of user C.

5.3.3 Calling/Connected line identification restriction

Include call shall not have any interaction with calling/connected line identification restriction.

5.3.4 Call report

Include call shall not have any interaction with call report.

5.3.5 Talking party identification

Include call shall not have any interaction with talking party identification.

5.3.6 Call forwarding unconditional

Include call shall not have any interaction with call forwarding unconditional. If the called party in the second call has call forwarding unconditional active, and the appropriate forwarding conditions are met, the SwMI shall attempt to establish the second call with the forwarded-to subscriber and subsequently proceed as if the second call had been placed to him/her.

5.3.7 Call forwarding on busy

Same as the interaction with call forwarding unconditional.

5.3.8 Call forwarding on no reply

Same as the interaction with call forwarding unconditional.

5.3.9 Call forwarding on not reachable

Same as the interaction with call forwarding unconditional.

5.3.10 List Search Call (LSC)

Include call shall not have any interaction with SS-LSC. After SS-IC invocation, the second call can be established using SS-LSC.

5.3.11 Call Authorized by Dispatcher (CAD)

Include call shall not have any interaction with SS-CAD. After SS-IC invocation, the second call can be established using SS-CAD.

5.3.12 Short Number Addressing (SNA)

Include call shall not have any interaction with SS-SNA. After SS-IC invocation, the second call can be established using SS-SNA.

5.3.13 Area Selection (AS)

Include call shall not have any interaction with SS-AS. After SS-IC invocation, the second call can be established using SS-AS.

5.3.14 Access Priority (AP)

Include call shall not have any interaction with SS-AP. After SS-IC invocation, the second call can be established using SS-AP.

5.3.15 Priority Call (PC)

Include call shall not have any interaction with SS-PC. After SS-IC invocation, the second call can be established using SS-PC.

5.3.16 Call Waiting (CW)

Assuming that user A, user B and user C have subscribed to the SS-CW service, then:

- in any case, SS-IC cannot be used to include a waiting call, presented to user A or user B, in the original call;
- if a call waiting indication is presented to user A either before or during SS-IC invocation, then the call waiting indication should still be present after completion of SS-IC.

5.3.17 Call Hold (HOLD)

During SS-IC operation with the second call in progress but the resulting call not established yet, user A can invoke SS-HOLD which shall result in the two existing calls (original and second calls) being held separately.

A served user A who is engaged in an active call with user B (original call) shall be able to invoke SS-IC to a user C that is already on hold to served user A. This shall allow user A to include user C in the original call. In such a case, the call on hold between user A and user C prior to SS-IC invocation shall play the role of the second call in the usual SS-IC mechanism. Upon completion of SS-IC, user C shall join the resulting call and be notified of this new state.

If user C is already involved in an active call when user A makes the second call, user C shall receive a call waiting indication; then user C may put his active call on hold to accept the second call; the former active call should still be present and on hold after completion of SS-IC and user C may then retrieve it.

User B may put the original call on hold either before or during SS-IC invocation; if user B subsequently attempts to retrieve the original call after successful completion of SS-IC, he shall join the resulting call and should therefore be notified of this new state.

User A may put the original call on hold prior to SS-IC invocation; he may then invoke SS-IC and make the second call; SS-IC shall not be considered as complete until user A successfully attempts to retrieve the original call, which shall then result in the establishment of the resulting call; user B shall be notified of this new state.

5.3.18 Call Completion to Busy Subscriber (CCBS)

If user A encounters a busy condition when making the second call to user C, he may invoke SS-CCBS against user C. SS-IC shall be completed with a failure corresponding to the condition encountered. However, upon completion of the second call by the SwMI (i.e. when user C becomes available), if the original call is still going on and user A has call waiting activated, he may receive an indication that the call from user C is alerting and he may then put the original call on hold to receive the call from user C.

5.3.19 Late Entry (LE)

Include call shall not have any interaction with SS-LE and users shall be able to receive SS-LE messages.

5.3.20 Transfer of Control (TC)

Include call shall not have any interaction with SS-TC. Since only the call owner may invoke SS-IC, SS TC may be used to allow the transferred-to user to use SS-IC, provided that this user is a valid subscriber of SS-IC.

5.3.21 Pre-emptive Priority Call (PPC)

Include call shall not have any interaction with SS-PPC. After SS-IC invocation, the second call can be established using SS-PPC.

5.3.22 Include call

A user may successively invoke SS-IC several times; any limitation to this procedure is an operator option.

A user may be included in several calls, provided that only one call is active at a time (the other ones being held).

5.3.23 Advice of charge

Include call shall not have any interaction with advice of charge.

5.3.24 Barring of Outgoing Calls (BOC)

Include call shall not have any interaction with SS-BOC. In case of conflict with SS-IC, then barring of outgoing calls shall prevail. In particular, if SS-BOC is activated against user A before SS-IC invocation, and if the second call falls in the category of calls barred to user A, then the attempt to set up the second call to user C shall be rejected by the SwMI, thus producing a failure of SS-IC request.

5.3.25 Barring of Incoming Calls (BIC)

Include call shall not have any interaction with SS-BIC. In case of conflict with SS-IC, then barring of incoming calls shall prevail. In particular, if SS-BIC is activated against user C before SS-IC invocation, and if the second call falls in the category of calls barred to user C, then the attempt to set up the second call to user C shall be rejected by the SwMI, thus producing a failure of SS-IC request.

5.3.26 Discreet Listening (DL)

Include call shall not have any interaction with SS-DL.

5.3.27 Ambience Listening (AL)

Include call shall not have any interaction with SS-AL.

5.3.28 Dynamic Group Number Assignment (DGNA)

Include call shall not have any interaction with SS-DGNA.

5.3.29 Call Completion on No Reply (CCNRy)

If user A encounters a no reply condition when making the second call to user C, he may invoke SS-CCNR against user C. SS-IC shall be completed with a failure corresponding to the condition encountered. However, upon completion of the second call by the SwMI (i.e. when user C becomes available), if the original call is still going on and user A has call waiting activated, he may receive an indication that the call from user C is alerting and he may then put the original call on hold to receive the call from user C.

5.3.30 Call Retention (CRT)

Include call shall not have any interaction with SS-CRT.

5.4 Inter-working considerations

When users A, B and C are on different networks, the availability of SS-IC to user A shall be limited by the capabilities of the other networks and the inter-working functions between the SwMI and the other networks.

5.5 Overall SDL

Figure 1 contains the dynamic description of SS-IC using the Specification Description Language (SDL) defined in ITU-T Recommendation Z.100 [3]. The SDL process represents the behaviour of the network in providing SS-IC.

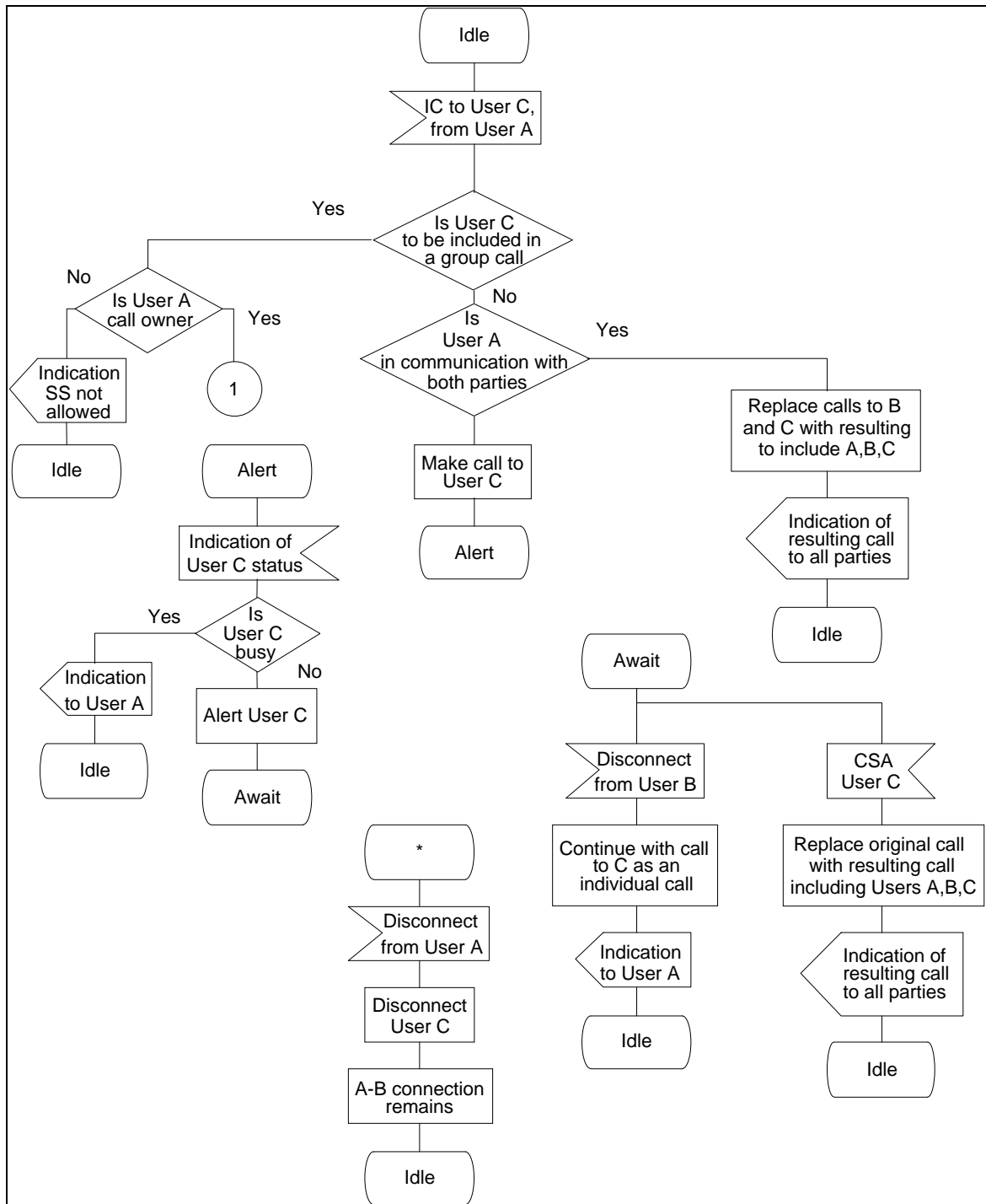


Figure 1: sheet 1 of 2, SS IC, overall SDL

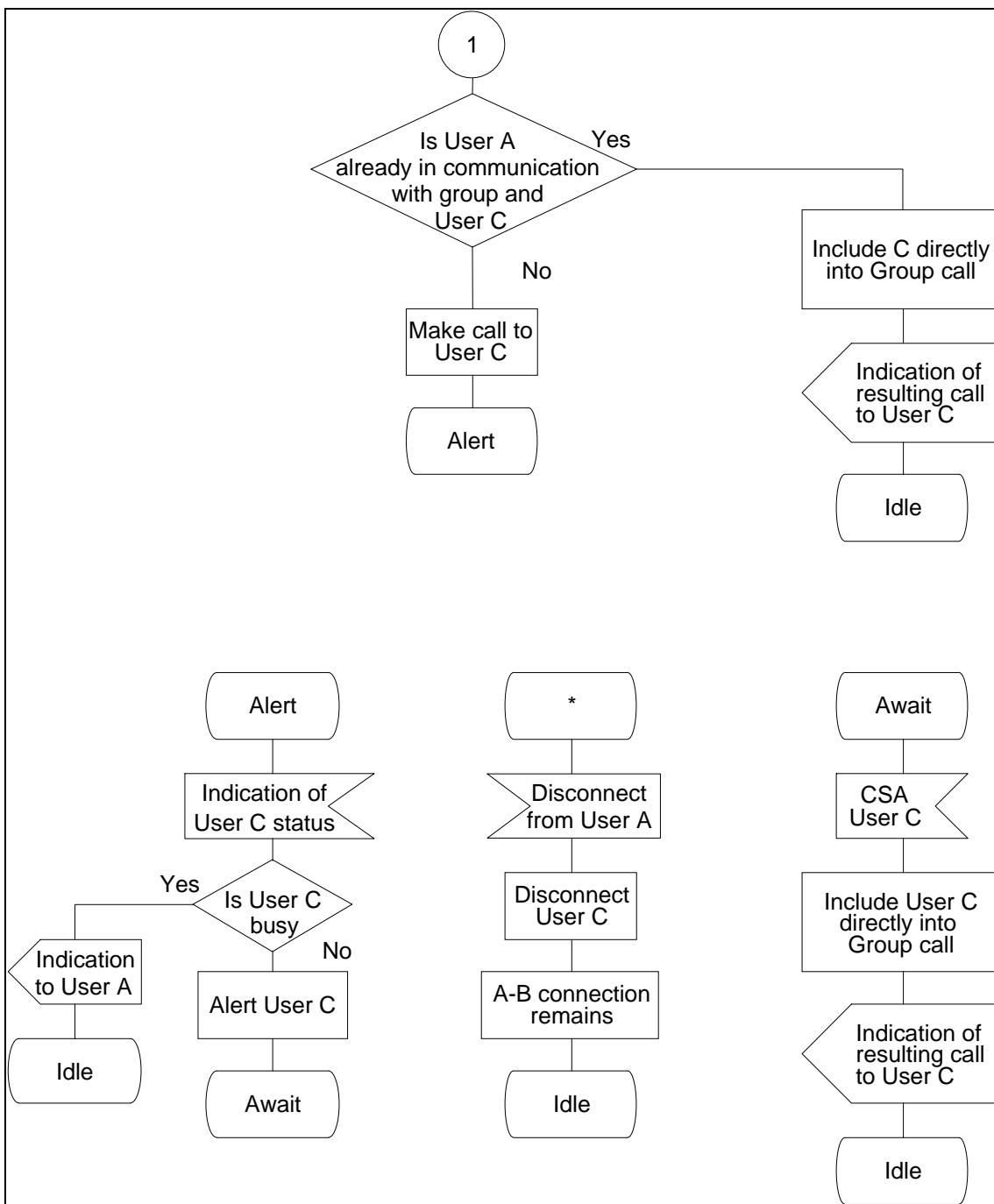


Figure 1: sheet 2 of 2, SS IC, overall SDL

History

Document history			
November 1994	Public Enquiry	PE 73:	1994-11-07 to 1995-03-03
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