EUROPEAN TELECOMMUNICATION STANDARD

ETS 300 392-10-5

August 2000

Second Edition

Source: TETRA

Reference: RE/TETRA-03001-10-05

ICS: 33.020

Key words: Data, list, radio, speech, stage 1, supplementary service, TETRA, V+D

Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 5: List Search Call (LSC)

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
Internet: secretariat@etsi.fr - http://www.etsi.org

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

Contents

Foreword

This European Telecommunication Standard (ETS) was produced by the Terrestrial Trunked Radio (TETRA) ETSI Project of the European Telecommunications Standards Institute (ETSI).

This ETS consists of 14 parts as follows:

Part 1: "General network design";

Part 2: "Air Interface (AI)";

Part 3: "Interworking at the Inter-System Interface (ISI)";

Part 4: " Gateways basic operation";

Part 5: "Peripheral Equipment Interface (PEI)";

Part 6: "Line connected Station (LS)";

Part 7: "Security";

Part 8: "Network management services";

Part 9: "General requirements for supplementary services";

Part 10: "Supplementary services stage 1";

Part 11: "Supplementary services stage 2";

Part 12: "Supplementary services stage 3";

Part 13: "SDL model of the Air Interface (AI)";

Part 14: "Protocol Implementation Conformance Statement (PICS) proforma specification".

Transposition dates	
Date of adoption of this ETS:	2 June 2000
Date of latest announcement of this ETS (doa):	30 November 2000
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 May 2001
Date of withdrawal of any conflicting National Standard (dow):	31 May 2001

Blank page

1 Scope

This European Telecommunication Standard (ETS) defines the stage 1 specifications of the List Search Call (LSC) supplementary services for the Terrestrial Trunked Radio 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 services 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.

Supplementary services specifications are produced in three stages according to the method defined in CCITT Recommendation I.130 [1]. The stage 1 description given in this ETS gives the supplementary services requirements seen from the user point of view. The stage 2 description identifies the functional capabilities and the information flows needed to support the supplementary services as specified in its stage 1 description (see ETS 300 392-10-2 [3]). The stage 2 description is followed by the stage 3 description, which specifies the protocols at the air interface and at the various Inter-System Interfaces (ISI) to support the service.

Charging principles and Man Machine Interface are outside the scope of this ETS.

The LSC supplementary services allows an incoming call to be offered to a pre-defined list of attendants in sequence, until the incoming call is answered or the call set up attempt is considered to be unsuccessful.

2 Normative references

This ETS incorporates by dated and 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 Z.100 (1993): "Specification and description language".

[3] ETS 300 392-10-2 (1996): "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 2: Call report".

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purpose of this ETS, the following terms and definitions apply:

attendant: address within the search list, which has been designated upon definition by the authorized user to receive calls

authorized user: user authorized to define and activate the search list against an Individual TETRA Subscriber Identity (ITSI)

Base Station (BS): physical grouping of equipment, which provides the fixed portion of the air interface. One base station transmits and receives radio signals to and from a single location area (a single region of geographical coverage). A BS contains at least one Base Radio Stack (BRS)

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

search list: group of attendants accessed by the infrastructure in sequence

search list number: number (ITSI) to which a search list is assigned

served user: user making an incoming call to the search list number

Supplementary services (SS): supplementary services modifies or supplements a bearer service or a teleservice. A supplementary services 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: type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols

3.2 Abbreviations

3.2.1 General abbreviations

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

ANF	Additional Network Function
GTSI	Group TETRA Subscriber Identity
ISDN	Integrated Services Digital Network
ITSI	Individual TETRA Subscriber Identity
SDL	(Functional) Specification and Description Language
SLN	Search List Number
SS	Supplementary services

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

SwMI	Switching and Management Infrastructure
TETRA	Terrestrial Trunked Radio

3.2.2 Supplementary services abbreviations

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

AL	Ambience Listening
AS	Area Selection
BIC	Barring of Incoming Calls
CAD	Call Authorized by Dispatcher
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CFB	Call Forwarding on Busy
CFNRc	Call Forwarding on Not Reachable
CFNRy	Call Forwarding on No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling/Connected Line Identification Restriction
COLP	Connected Line Identification Presentation
CW	Call Waiting
DL	Discreet Listening
LSC	List Search Call
PC	Priority Call
PPC	Pre-emptive Priority Call
SLN	Search List Number
SNA	Short Number Addressing

3.3 Symbols

There are no other symbols in this ETS besides those symbols used in SDL diagrams according to ITU-T Recommendation Z.100 [2].

4 SS-LSC Stage 1 Specification

4.1 Description

4.1.1 General Description

The LSC supplementary services allows an authorized user to define a list of attendants so that when a served user makes an incoming call to the Search List Number (SLN), the infrastructure shall re-route the incoming call to the first attendant within the search list. If the call request to the first attendant is unsuccessful, then the infrastructure shall attempt to re-route the call request to the second attendant in the search list, and so on until either an attendant answers or the end of the search list is reached.

The actual re-routeing sequence within the list is outside the scope of this ETS; as an implementation option, a given search list may be associated to a particular sequence referred to by a sequence number.

It shall be possible to add/remove an attendant from the list and to replace an attendant in the list by another attendant.

The Search List Number is not physically associated to a particular MS/LS.

Supplementary services shall not be associated with the search list number except for SS-Barring of Incoming Calls (BIC).

Different supplementary services may be associated to an attendant ITSI depending on whether that ITSI is called as part of a LSC call or as part of an individual call. Some of the supplementary services interactions with SS-LSC may override the interactions of the same supplementary services when involved in a non SS-LSC related call.

There shall be no restriction on the addressing domains of the attendants within the search list.

NOTE 1: This implies that the search list include attendants who may belong to different SwMIs.

NOTE 2: An attendant, in the search list, who migrates to a different SwMI will remain in the search list.

The identities of the attendants may be given either as ITSIs or Group TETRA Subscriber Identity (GTSI)s.

NOTE 3: The GTSI is the last number of the search List.

It shall be possible for an authorized user to define a number of search lists. Those search lists may be different for different basic services, e.g. one list for speech, one list for data and one list for both.

4.1.2 Qualifications on applicability to Telecommunication Services

SS-LSC activated against an ITSI: shall be applicable to all incoming individual circuit mode TETRA teleservices and bearer services. SS-LSC shall not be activated for Status Call and for SDS "Call".

SS-LSC can be activated against a GTSI.

NOTE: A GTSI may be located anywhere in the search list.

4.2 Procedures

4.2.1 Provision/Withdrawal

The LSC supplementary services shall be provided by prior arrangement with the service provider. Search List Numbers (SLN) shall be allocated upon provision.

The LSC supplementary services can be withdrawn by the service provider at the request of the authorized user or for administrative purposes.

The authorized user shall be able to carry out the process of definition upon provision.

4.2.2 Normal procedures

4.2.2.1 Activation, deactivation, definition, registration, interrogation and cancellation

4.2.2.1.1 Activation and deactivation

SS-LSC shall be activated/deactivated upon request from the authorized user. The authorized user shall associate the SLN with a search list. It may be possible to activate many search lists against the one SLN, depending on implementation. At any given time, only one search list shall be associated to a SLN for a given basic service. A search list shall be identified by the SLN, which corresponds to an ITSI.

Like any ITSI, the SLN shall be associated to one given "home" SwMI; contrary to any other ITSI, the SLN shall be assumed to have a fixed location; in other words, no migration of the ITSI corresponding to the SLN.

4.2.2.1.2 Definition

The authorized user shall be able to carry out the process of definition upon provision. A SwMI shall provide definition upon request from the authorized user.

To define SS-LSC, the authorized user shall supply:

1) the identification of the search list;

2) the identification of each attendant in the search list.

NOTE 1: During the definition process the attendants may be initially addressed by SS-Short Number Addressing (SNA), which would be converted by the infrastructure to the full ITSI.

The number of attendants in each search list shall be an operator option.

NOTE 2: At least one attendant should be listed.

The number of search lists shall be an operator option.

When the authorized user requests definition of SS-LSC, the service provider shall return acceptance or rejection of the request (see exception procedures for a list of possible causes of rejection).

The authorized user shall be able to add one attendant in the list, to remove one attendant from a search list and to replace one attendant by another attendant.

4.2.2.1.3 Registration

Registration shall be used by the network to determine authorized users who are permitted to define each search list.

4.2.2.1.4 Interrogation

If interrogation is provided, the SwMI shall support interrogation on a search list number basis. The TETRA response to an interrogation request may provide the following information to the authorized user:

- activated or deactivated state of the search lists;

- constituent attendants of the appropriate search list.

The SwMI may support general interrogation of SS-LSC. The TETRA response may be identification of search list numbers defined by the authorized user.

4.2.2.1.5 Cancellation

Not applicable.

4.2.2.2 Invocation and operation

The service is invoked by an incoming basic service call to the search list number, and SS-LSC being activated against that ITSI.

When invoked, the call shall first be offered in sequence to attendants in the search list, one at a time. The precise algorithm of the sequence shall be dependent on the network implementation. After a time-out, or active rejection of the call by the first attendant, the incoming call shall subsequently be offered to a second attendant in the activated search list, and depending on the implementation, a notification may be sent to the calling user that his call is in the process of being offered to another attendant.

If the call to the second attendant in the search list is unsuccessful then the infrastructure shall release this call attempt and attempt to offer the call to a third attendant in the search list, and so on until either the call is answered or the end of the search list is reached.

If, after the end of the sequence has been reached and the call remains unanswered, the calling user shall receive a notification that the call attempt has been unsuccessful, and the reason for rejection, e.g. attendants are busy, no reply or not reachable.

The successive attendants involved in the call shall not be informed of the fact that the call presented to them is in fact a call resulting from invocation of SS-LSC.

4.2.3 Exceptional procedures

4.2.3.1 Activation, deactivation, definition, registration, interrogation and cancellation

4.2.3.1.1 Activation and deactivation

When authorized user initiated activation or deactivation cannot be completed, an indication shall be returned to the authorized user. Possible causes for rejection can be:

- insufficient information;

- invalid ITSI/GTSI for the attendant address;

- invalid search list number.

If the infrastructure deactivates SS-LSC without the authorized user(s) having requested deactivation (e.g. when an exceptional condition occurs), the authorized user shall receive notification along with the cause.

4.2.3.1.2 Definition

If the system cannot accept a definition request, the authorized user should receive a notification that SS-LSC definition was not successful. Possible causes can be:

- insufficient information;
- invalid ITSI/GTSI for the attendant address;
- number of attendants exceeded;
- invalid search list number.

4.2.3.1.3 Registration

Not applicable.

4.2.3.1.4 Interrogation

If the SwMI cannot accept an interrogation request, the interrogating user shall receive a notification that SS-LSC interrogation was unsuccessful. Possible causes for rejection can be:

- insufficient information;
- invalid ITSI for the search list number.

4.2.3.1.5 Cancellation

Not applicable.

4.2.3.2 Invocation and operation

If there is no list associated with the SLN or the SLN is not activated, the calling user shall receive an indication that the call has failed, e.g. an indication of number unobtainable.

4.3 Interaction with other supplementary services and ANFs

4.3.1 Calling line identification presentation

Attendant who has activated the SS-Calling Line Identification Presentation (CLIP): there shall not be any interaction.

4.3.2 Connected line identification presentation

Calling user who has activated SS-Connected Line Identification Presentation (COLP): there shall not be any interaction.

NOTE: There is no actual connection to the SLN.

4.3.3 Calling/Connected line identification restriction

Served user who has activated SS-Calling/Connected Line Identification Presentation (CLIR): there shall not be any interaction.

Attendant who has activated SS-CLIR: there shall not be any interaction, i.e. the calling user shall not receive the identity of the attendant unless the calling user has an override capability.

Calling user who has activated SS-CLIR: there shall not be any interaction. The attendant shall not receive the identity of the calling user, unless the attendant has an override capability.

4.3.4 Call report

List search call shall not have any interaction with call report. It is an implementation option as to which attendant the call report shall be sent to.

NOTE: The call report is not sent to the SLN.

4.3.5 Talking party identification

List search call shall not have any interaction with talking party identification.

4.3.6 Call forwarding unconditional

List search call shall not have any interaction with call forwarding unconditional as SS-Call Forwarding Unconditional (CFU) cannot be activated against a search list number.

Attendant who has activated SS-CFU: there shall not be any interaction. On a call to the attendant, SS-CFU shall be invoked and the call shall be diverted as appropriate. If the call cannot be completed to the diverted-to user, then the next attendant in the search list shall be offered the call.

4.3.7 Call forwarding on busy

List search call shall not have any interaction with call forwarding on busy as SS-Call Forwarding on Busy (CFB) cannot be activated against the search list number.

Attendant who has activated SS-CFB: on a call to the attendant and that attendant is busy, dependent on the network implementation, SS-CFB may be invoked or the call may be offered to the next attendant in the search list.

4.3.8 Call forwarding on no reply

List search call shall not have any interaction with call forwarding on no reply as SS-Call Forwarding on No Reply (CFNRy) cannot be activated against the search list number.

Attendant who has activated SS-CFNRy: on a call to the attendant and that attendant does not reply, dependent on the network implementation, SS-CFNRy may be invoked or the call may be offered to the next attendant in the search list.

4.3.9 Call forwarding on not reachable

List search call shall not have any interaction with call forwarding on not reachable as SS-Call Forwarding on Not Reachable (CFNRc) cannot be activated against the search list number.

Attendant who has activated SS-CFNRc: on a call to the attendant and that attendant is not reachable, dependent on the network implementation, SS-CFNRc may be invoked or the call may be offered to the next attendant in the search list.

4.3.10 List search call

It is possible that an attendant in the list may be a search list number. Under these circumstances the incoming call shall invoke the additional list search call. It is an operator option as to the number of times SS-LSC may be invoked during the course of call.

4.3.11 Call authorized by dispatcher

SS-Call Authorized by Dispatcher (CAD) which applies to the attendant: if the attendant is a restricted user i.e. certain incoming categories of incoming calls cannot proceed before authorization by a dispatcher, then SS-CAD shall be invoked before the call is routed to the attendant. After authorization, the dispatcher shall allow the incoming call to proceed to the attendant.

Calling user who has invoked SS-CAD: there shall not be any interaction.

4.3.12 Short number addressing

List search call shall not have any interaction with short number addressing.

4.3.13 Area selection

If the calling user has activated SS-Area Selection (AS) and the attendant is outside the selected area, then the call shall fail and the next attendant in the list shall be tried.

4.3.14 Access priority

List search call shall not have any interaction with access priority.

4.3.15 Priority call

List search call shall not have any interaction with priority call.

4.3.16 Call waiting

Attendant who has activated SS-Call Waiting (CW): SS-CW shall be invoked and the attendant shall receive an indication that an incoming call is waiting for attention.

4.3.17 Call hold

List search call shall not have any interaction with call hold.

4.3.18 Call completion to busy subscriber

If the supplementary services has searched through the list without success, and has informed the calling user that the call cannot be completed due to busy attendants, as a network implementation option, the calling user may invoke the SS-Call Completion to Busy Subscriber (CCBS). If the SS-CCBS invocation is accepted, the network shall monitor the attendants in the search list.

4.3.19 Late entry

List search call shall not have any interaction with late entry.

4.3.20 Transfer of control

List search call shall not have any interaction with transfer of control.

4.3.21 Pre-emptive priority call

The Pre-emptive Priority Call (PPC) shall be offered to the attendants in the search list by sequence, (the sequence may offer the PPC to the available attendants in the list first), until either (a) an attendant answers or (b) a busy attendant is found and is pre-empted or (c) the end of the search list is reached without success.

4.3.22 Include call

List search call shall not have any interaction with include call.

4.3.23 Advice of charge

List search call shall not have any interaction with advice of charge.

4.3.24 Barring of outgoing calls

List search call shall not have any interaction with barring of outgoing calls. For the calling user, only the barring of the search list number is checked by the network. There is no re-checking for barring calls to the attendants.

4.3.25 Barring of incoming calls

SS-BIC may be activated against the search list number. This shall not affect the individual barring profiles that the attendants may have activated.

4.3.26 Discreet listening

Not applicable. SS-Discreet Listening (DL) cannot be invoked to a search list number.

4.3.27 Ambience listening

Not applicable. SS-Ambience Listening (AL) cannot be invoked to a search list number.

4.3.28 Dynamic group number assignment

List search call shall not have any interaction with dynamic group number assignment.

4.3.29 Call completion on no reply

If the supplementary services has searched through the list without success, and has informed the calling user that the call cannot be completed due to no reply from the attendants, as a network implementation option, the calling user may invoke the SS-Call Completion on No Reply (CCNR). If the SS-CCNR invocation is accepted, the network shall monitor the attendants.

4.3.30 Call retention

List search call shall not have any interaction with call retention.

4.3.31 Interaction with ANF-ISI

List Search Call shall be available across the Inter System Interface.

Attendants defined as such under SS-LSC may belong to different SwMIs. A call to a SLN may have to be extended from one SwMI to another SwMI through ANF-ISI. ANF-ISI shall allow to indicate to another SwMI that the call it is presenting is in fact a SS-LSC related call.

If a SwMi does not support SS-LSC, the originating SwMI will try to forward the SS-LSC related call to another SwMI who supports SS-LSC.

4.3.32 Interaction with ANF-MM

4.4 Inter-working considerations

There are no equivalent defined supplementary services so that there are no interworking considerations.

NOTE: The closest similar supplementary services is Line Hunting in ISDN.

4.5 Overall SDL

Figure 1 contains the dynamic description of SS-LSC using the Specification and Description Language (SDL) defined in ITU-T Recommendation Z.100 [2]. The SDL process represents the behaviour of the network in providing SS-LSC. Input signals from the left and output signals to the left represent primitives from and to the served user.

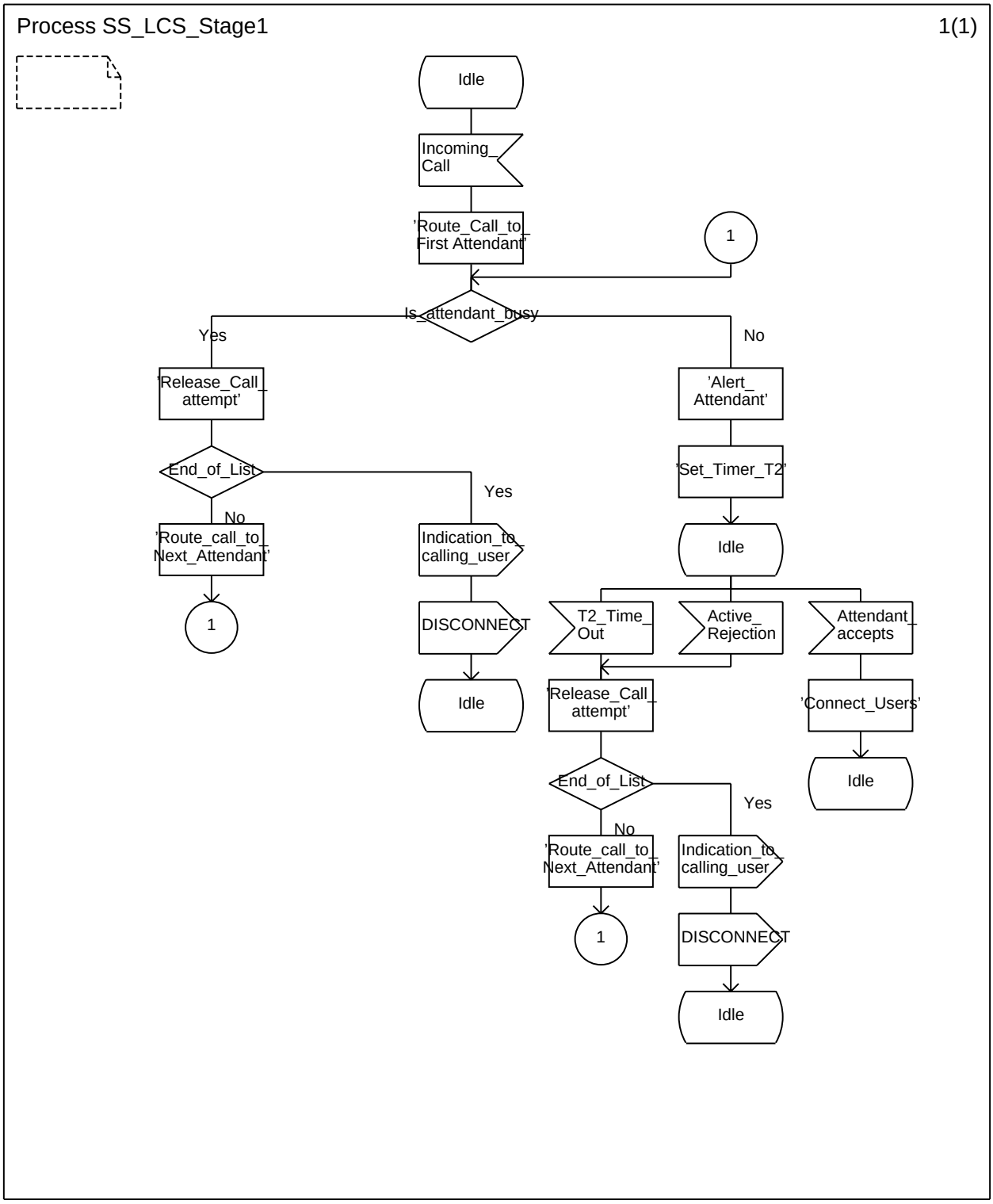

Figure 1: List search call supplementary services, overall SDL

History

Document history	
April 1996	First Edition
February 2000	One-step Approval Procedure OAP 200022: 2000-02-02 to 2000-06-02
August 2000	Second Edition