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**Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 10: Supplementary services stage 1;
Sub-part 20: Discreet Listening (DL)**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Terrestrial Trunked Radio (TETRA) Project 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: "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 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:	9 April 1999
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1 Scope

This European Telecommunication Standard (ETS) defines the stage 1 specifications of the Discreet Listening (DL) supplementary service for the Terrestrial 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 this ETS specifies the interactions with other TETRA supplementary services and inter-working considerations.

Charging principles are outside the scope of this ETS.

The DL supplementary service shall enable an authorized user to listen to one or more communications between TETRA subscribers (Mobile Station (MS) or Line Station (LS)) without any indication to any user that the communication is being monitored.

As options, the authorized user shall be able to intrude into the existing call and shall be able to forcefully clear the monitored call without call owner consent (in the case of a group call).

2 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] ITU-T Recommendation Z.100 (1993): "CCITT Specification and Description Language (SDL)".

3 Definitions and abbreviations

3.1 Definitions

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

affected user: individual or group who's calls are monitored

authorized user: user who is responsible for the activation and deactivation of the service. The authorized user may also interrogate the service and profile access. The authorized user is the monitoring user as well

Line Station (LS): physical grouping that contains all of the fixed equipment that is used to obtain terrestrial access to TETRA services

bearer service: type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces. For this ETS, this involves circuit-mode only

Mobile Station (MS): physical grouping that contains all of the mobile equipment that is used to obtain TETRA services. By definition, a mobile station contains at least one Mobile Radio Stack (MRS)

monitoring party: authorized user who requests discreet listening

served user: monitored user

Supplementary Service (SS): 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

user group: those TETRA users, terminals or gateways between which any individual or group communication shall be monitored

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:

DMO	Direct Mode Operation
SS-DL	Supplementary Service Discreet Listening
ISDN	Integrated Services Digital Network
ITSI	Individual TETRA Subscriber Identity
LS	Line Station
MS	Mobile Station
MRS	Mobile radio Stack
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
CFB	Call Forwarding on Busy
CFNRy	Call Forwarding on No Reply
CFNRc	Call Forwarding on Not Reachable
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling/Connected Line Identification Restriction
COLP	COnnected Line identification Presentation
CR	Call Report
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
TPI	Talking Party Identification

4 SS-DL stage 1 specification

4.1 Description

4.1.1 General description

Discreet listening shall be defined as the facility whereby one authorized user at a time may listen to communications between TETRA subscribers (MS or LS) without any indication to any subscriber that the communication is being monitored. Identification of the talking party shall be given to the monitoring party. There can be several authorized users but only one is active for the SS-DL at a time. As an implementation option the monitoring party may further be allowed to enter into the conversation and/or may clear the call if required.

For security reasons, access to/from a non TETRA network (PSTN/ISDN/GSM) is outside the scope of this ETS.

4.1.2 Qualifications on applicability to telecommunication services

Discreet listening shall be applicable to all speech TETRA teleservices and bearer services. Discreet Listening shall not be applicable to either SDS or packet data service. Extension of SS-DL to end-to-end encryption is outside the scope of this ETS. DMO only calls are outside the scope of this ETS. SS-DL is applicable to DMO calls which are extended to Trunked system via a DMO Gateway.

4.2 Procedures

There shall not be any authentication process in relation to activation, deactivation and interrogation, the only authentication being done by actual checking of the authorized ITSI access to the activation, deactivation and interrogation requests.

4.2.1 Provision/Withdrawal

This service shall be provided, by prior arrangement with the service provider. The provision/withdrawal procedure details are outside the scope of this standard.

To provide operator:

SS-DL, the authorized user shall provide to the operator:

- the user group which may be monitored;
- the basic service which shall be applicable to the user group, e.g. clear speech group call;
- the list of authorized users (monitoring parties).

NOTE 1: Verification of the user group should be accomplished before completing the discreet listening provision. This verification shall be completed by a check of the user group numbers to ascertain if the numbers are within the jurisdiction of the user, and within the allowed number range.

NOTE 2: When the monitoring party is provided with SS-DL, the service provider shall return notification of acceptance or rejection of the request. This notification shall include the user groups and/or basic services to which discreet listening is registered.

This service may be withdrawn by the service provider at the customer request without prior information.

4.2.2 Normal procedures

4.2.2.1 Activation, Deactivation, Definition, Registration, Interrogation, Cancellation

4.2.2.1.1 Activation

The supplementary service shall be activated for a teleservice by the appropriate procedures being used by the authorized monitoring party and only if the supplementary service is registered for that teleservice. The supplementary service may be activated either on a per identity basis, or on a permanent basis (upon the provision of the service).

To activate DL, the authorized monitoring user shall supply:

- the talk group individual user identity or the group identity it wishes to monitor;
- the basic service applicable, e.g. clear speech group call.

NOTE 1: If no basic service is indicated by the user, this is interpreted as all services.

NOTE 2: The applicable basic service is independent of the type of the identity, e.g. a request for clear speech group call against an individual identity activates monitoring of clear mode group calls in which the indicated individual is participating.

When the authorized user so activates SS-DL, the service provider shall return notification of acceptance or rejection of the request (see exceptional procedures for a list of possible causes for rejection). Notification of acceptance shall include the user group number and the basic service to which the DL is activated.

Verification of the call should be accomplished before completing the discreet listening provision. This verification shall be completed by a check of the user group numbers to ascertain if the numbers are within the jurisdiction of the user, and within the allowed number range.

The SS-DL activation lasts as long as it is not canceled by a corresponding deactivation (i.e. SS-DL is not activated only for some time period).

Only one monitoring user shall be defined for an SS-DL monitored user: if that monitoring user has too much traffic or is absent, it will be a matter internal to the SwMI where this monitoring user is registered to use a substitute to the defined monitoring user to the supplementary service operation.

Alternatively, the supplementary service may be permanently activated by the network at the request of the user.

4.2.2.1.2 Deactivation

The supplementary service shall be deactivated for a teleservice by appropriate procedures used by the monitoring party or if the supplementary service is withdrawn by the operator.

To deactivate DL, the served user shall supply:

- the identity;
- the basic service applicable to the call user group, e.g. clear speech group call.

NOTE: If no basic service is indicated by the user, this is interpreted as all services.

4.2.2.1.3 Definition

Shall not be applicable.

4.2.2.1.4 Registration

Registration shall be part of provision.

4.2.2.1.5 Interrogation

The SwMI may support interrogation by the authorized user on a per monitored identity basis for all basic services and/or for a user specified basic service. The TETRA response to an interrogation request may provide the following information to the user:

- activated or deactivated state of the supplementary service;
- applicable basic services;
- whether there are any appropriate calls in progress; and
- if applicable, type of the call and connected identity (individual or group).

4.2.2.1.6 Cancellation

Shall not be applicable. The monitored party shall not be able to interrogate whether he is being monitored by the authorized monitoring parties or not.

4.2.2.2 Invocation and operation

4.2.2.2.1 Basic operation

This service shall be invoked by the monitoring party (served user) activating the service and there being an applicable call in progress, or it may be invoked by the network (if the service is permanently activated) at the point when the applicable call is successfully set up.

The network shall acknowledge this request. If there is an appropriate communication in progress the network shall present the call to the monitoring party and upon its acceptance of the call shall include the monitoring party in the call for listening purposes. If there is no appropriate communication in progress, the network shall inform the monitoring party and shall wait until such a communication commences, until the monitoring party deactivates the monitoring.

Once the network detects an appropriate call, the monitoring party shall be informed and given the opportunity to be connected to the call even if it is already involved in another call. The monitoring party shall be given an indication of the identities of the connected individual or group and the talking party. This is not activation/deactivation but an operation phase function.

The monitoring party may release from the listened-to call at any time including at call set-up, and may return to any of the call in progress at any time.

The monitoring party who is involved in a group call may withdraw from that group call and then activates SS-DL to discretely listen to the continuation of that group call.

4.2.2.2.2 Forced release

As an implementation option, the monitoring party (served user) may be able to force release the call. An indication of the successful force release shall be notified to the authorized monitoring user, and the parties in the forced released call.

4.2.2.2.3 Intrusion

As an implementation option, the authorized monitoring party may be able to enter into the conversation of the ongoing call at any time.

4.2.3 Exceptional procedures

4.2.3.1 Activation, Deactivation, Definition, Registration, Interrogation, Cancellation

4.2.3.1.1 Activation

If the system cannot accept an activation request, the authorized monitoring LS (or MS) subscriber shall receive a notification that discreet listening activation was not successful. Possible causes can be:

- talk group call was not active;
- group call unauthorized;
- group call is the monitoring user's number;
- insufficient information;
- repeated request from the authorized user;
- service not available.

4.2.3.1.2 Deactivation

If the infrastructure cannot accept a LS (or MS) subscriber's request for deactivation, the cause shall be returned to the subscriber, such as:

- service not subscribed to;
- insufficient information;
- inconsistent with activation;
- incorrect user group call.

If the infrastructure deactivates discreet listening without the served user having requested deactivation (e.g. when an exceptional condition occurs), the served user shall receive notification accompanied with the cause.

4.2.3.1.3 Definition

Shall not be applicable.

4.2.3.1.4 Registration

Not applicable as part of provision.

4.2.3.1.5 Interrogation

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

- service or option not subscribed to;
- insufficient information;
- basic service to which relevance is requested is not subscribed to.

4.2.3.1.6 Cancellation

Shall not be applicable.

4.2.3.2 Invocation and operation

If the infrastructure cannot invoke the service, the cause shall be returned to the subscriber.

4.3 Interactions with other supplementary services

4.3.1 Calling Line Identification Presentation (CLIP)

Discreet listening shall not have any interaction with SS-CLIP.

4.3.2 Connected Line Identification Presentation (COLP)

Discreet listening shall not have any interaction with SS-COLP.

4.3.3 Calling/Connected Line Identification Restriction (CLIR)

Discreet listening shall not have any interaction with SS-CLIR.

4.3.4 Call Report (CR)

Discreet listening shall not have any interaction with SS-CR.

4.3.5 Talking Party Identification (TPI)

Discreet listening shall not have any interaction with SS-TPI; SS-DL does not need TPI to operate properly. However, as an option name service according to TPI may be part of SS-DL and the served user (monitoring party) gets the normal SS-TPI.

4.3.6 Call Forwarding Unconditional (CFU)

Discreet listening shall not have any interaction with SS-CFU. Call Forward Service in general shall either not be invoked or shall be inhibited so that the served user and only it does get the listening capability.

4.3.7 Call Forwarding on Busy (CFB)

Discreet listening shall not have any interaction with SS-CFB.

4.3.8 Call Forwarding on No Reply (CFNRy)

Discreet listening shall not have any interaction with SS-CFNRy.

4.3.9 Call Forwarding on Not Reachable (CFNR)

Discreet listening shall not have any interaction with SS-CFNR.

4.3.10 List Search Call (LSC)

Discreet listening shall not have any interaction with SS-LSC. A list search can be incorporated in the determination of an appropriate call to be monitored.

4.3.11 Call Authorized by Dispatcher (CAD)

This interaction shall not be allowed. It is unlikely that a user who is authorized to make discreet listening calls shall need to seek authorization from a dispatcher to make a call. In the event that the two supplementary services are registered against one user, then the service provider shall be required to resolve the conflict.

4.3.12 Short Number Addressing (SNA)

Discreet listening shall not have any interaction with SS-SNA.

4.3.13 Area Selection (AS)

Discreet listening shall not have any interaction with SS-AS.

4.3.14 Access Priority (AP)

Discreet listening shall not have any interaction with SS-AP.

4.3.15 Priority Call (PC)

Discreet listening shall not have any interaction with SS-PC.

4.3.16 Call Waiting (CW)

In the case the authorized monitoring user is either busy in a call or is already monitoring another call and a call is being activated for which SS-DL has been activated, a signal which may be identical to the CW signal shall be presented. During the time that discreet listening is active the monitoring party should be informed of any incoming calls waiting for himself/herself.

4.3.17 Call Hold (HOLD)

Discreet listening shall not have any interaction with SS-HOLD.

4.3.18 Automatic call completion

Discreet listening shall not have any interaction with automatic call completion.

4.3.19 Late Entry (LE)

Discreet listening shall not have any interaction with SS-LE.

4.3.20 Transfer of Control (TC)

In the case where as an implementation option, DL enables forced release of a call, DL will require a particular case of TC where the transfer of call is made without the call owner consent.

4.3.21 Pre-emptive Priority Call (PPC)

Discreet listening shall not have any interaction with SS-PPC.

4.3.22 Include Call (IC)

Discreet listening shall not have any interaction with SS-IC.

4.3.23 Advice of Charge (AC)

Discreet listening shall not have any interaction with SS-AC.

4.3.24 Barring of Outgoing Calls (BOC)

To allow proper operation of DL, monitoring user shall either not invoke BOC or shall have their SS-BOC inhibited.

4.3.25 Barring of Incoming Calls (BIC)

Not applicable.

4.3.26 Discreet Listening (DL)

See exceptional procedures.

4.3.27 Ambience Listening (AL)

Discreet listening shall not have any interaction with ambience listening; ambience listening and discreet listening are actually mutually exclusive from a user perspective; at any given time, both SS-DL and SS-AL may be activated; however, at that particular instant of time, a user is involved in one or the other of the two SSs.

4.3.28 Dynamic Group Number Assignment (DGNA)

Discreet listening shall not have any interaction with SS-DGNA.

4.4 Inter working considerations

Discreet listening shall not be available across PSTN/ISDN/GSM.

4.5 Overall SDL

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

Input signals from the left and output signals to the left represent primitives to and from the monitoring party.

Process Overall_SDL

1(4)

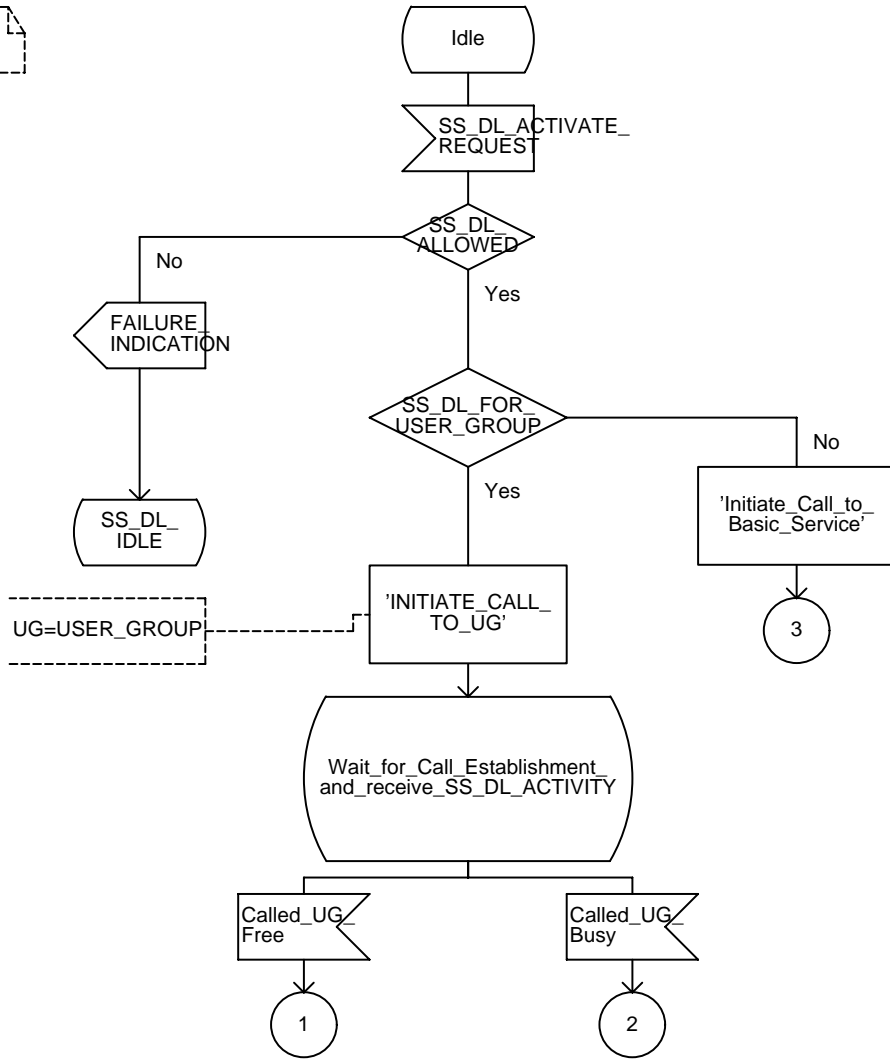


Figure 1: sheet 1 of 4, SS-DL, overall SDL

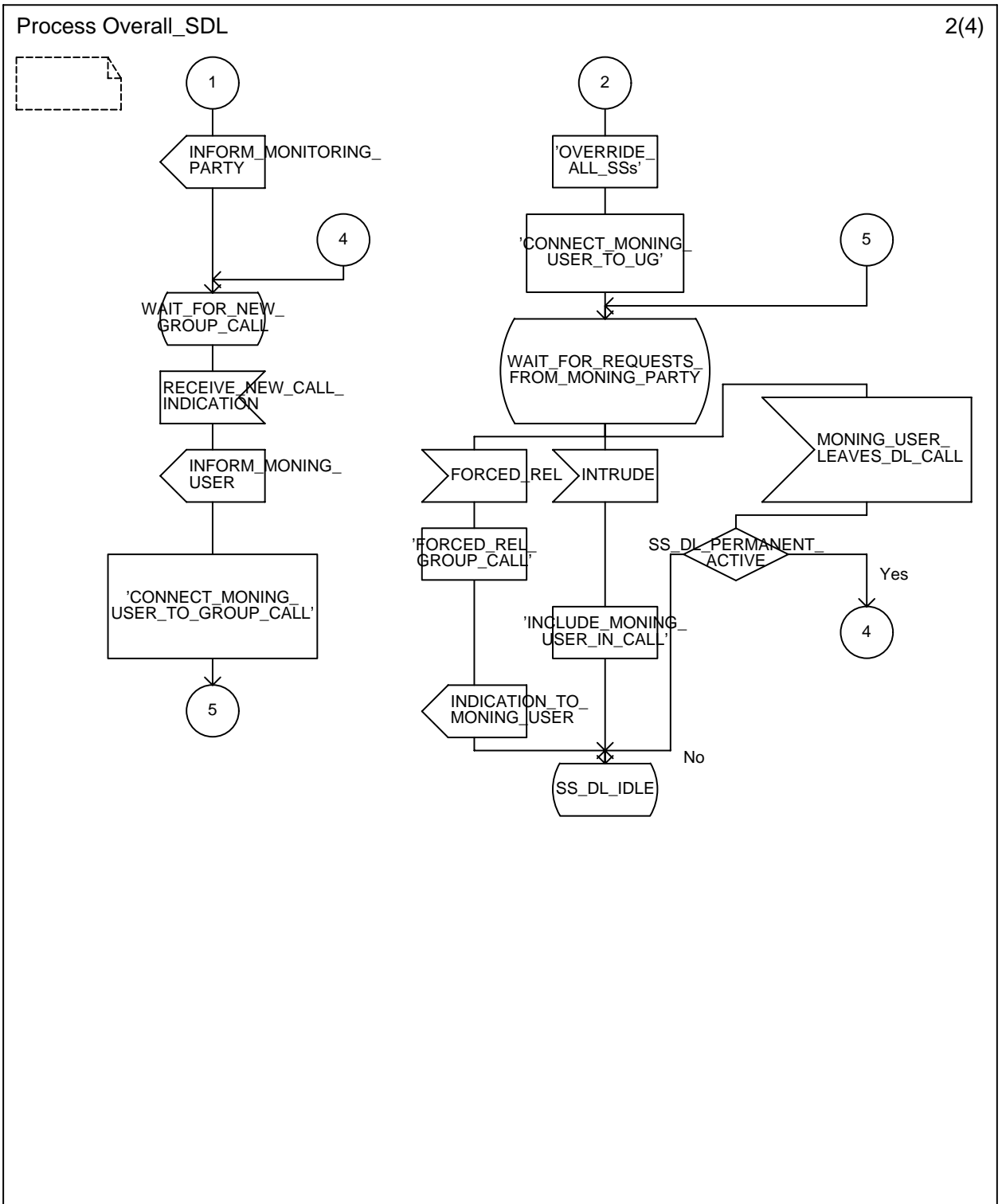


Figure 1: sheet 2 of 4, SS-DL, overall SDL

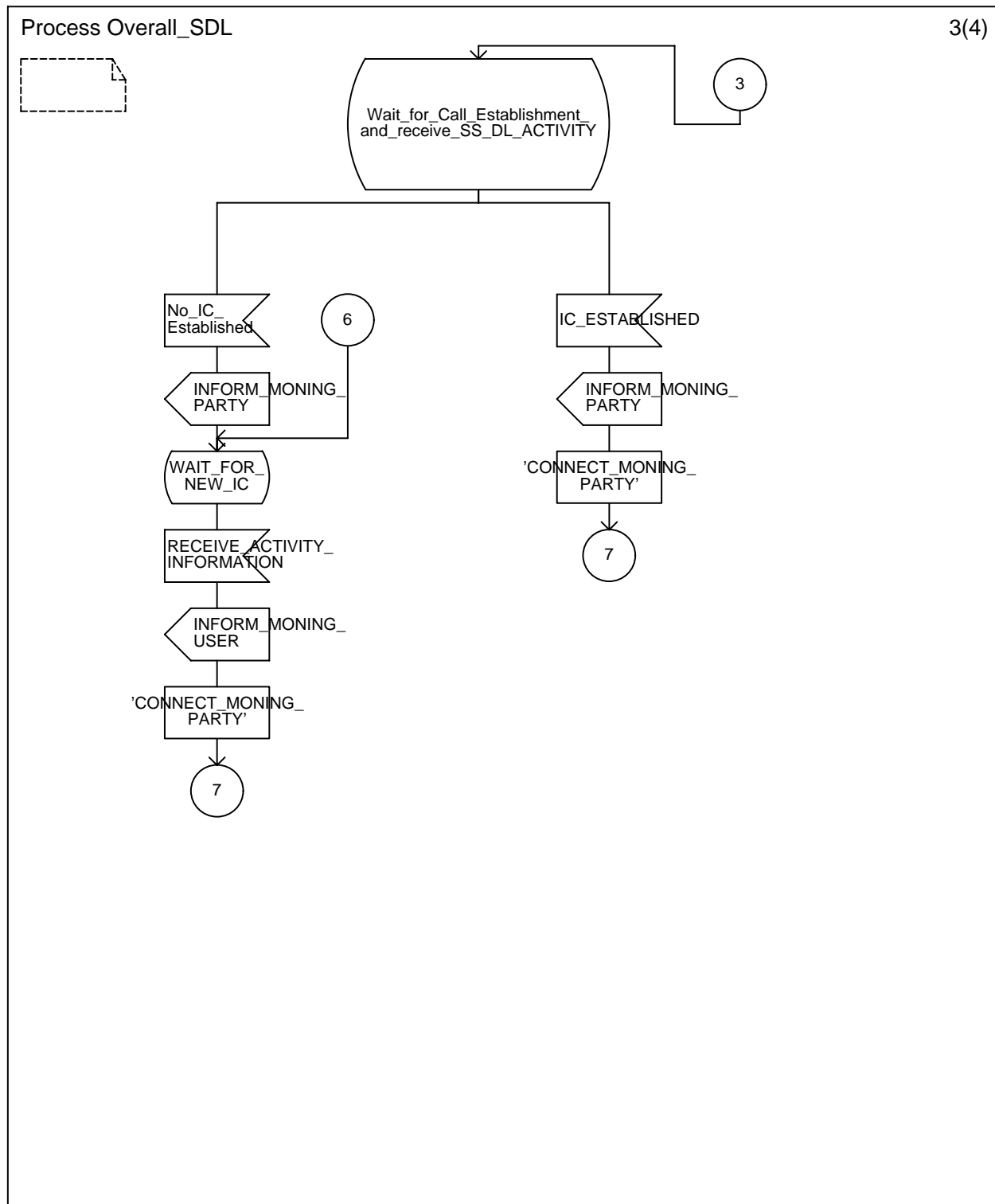


Figure 1: sheet 3 of 4, SS-DL, overall SDL

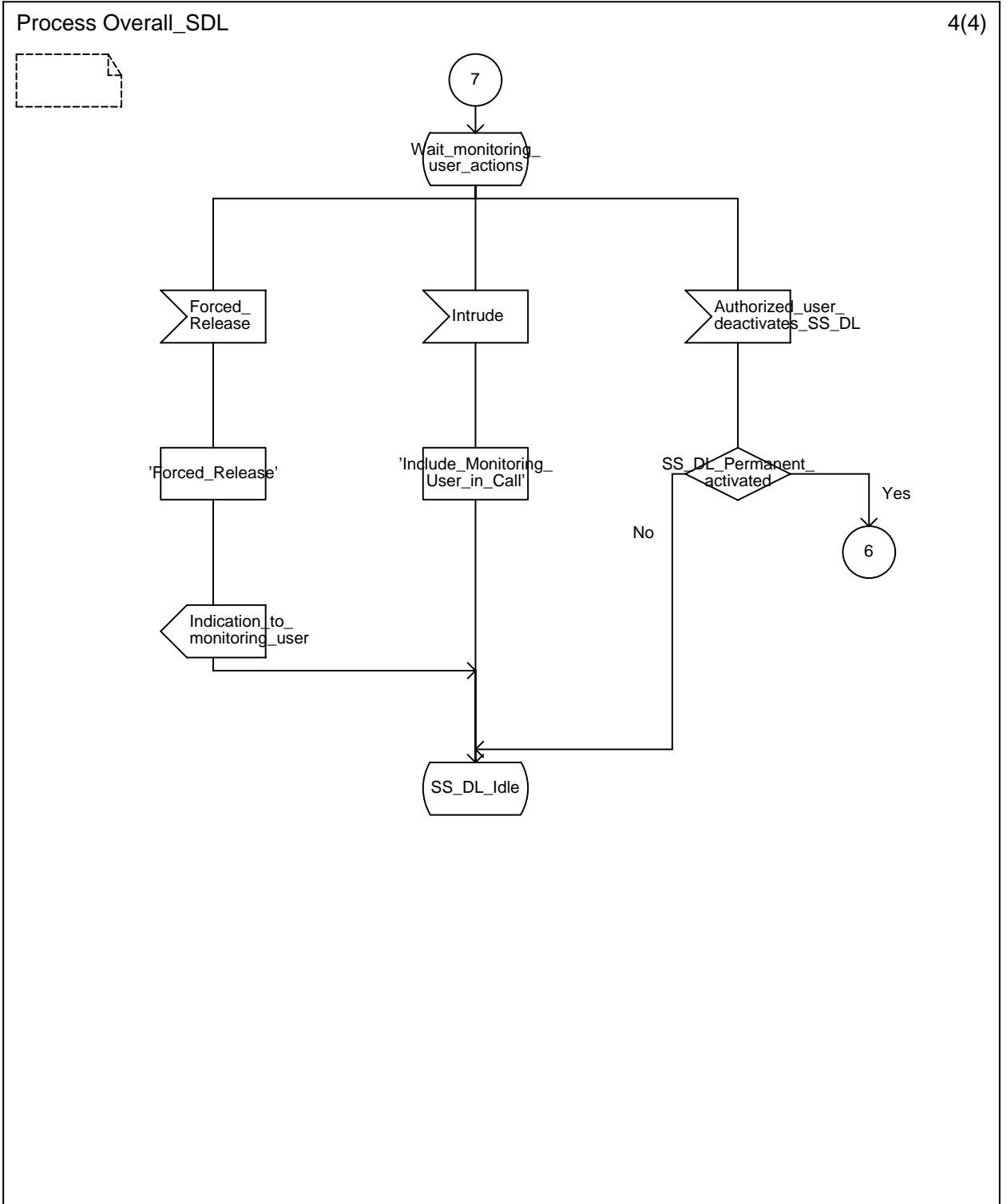


Figure 1: sheet 4 of 4, SS-DL, overall SDL

Annex A (informative): Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

- CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

History

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