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Foreword

This second edition 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:	27 November 1998
Date of latest announcement of this ETS (doa):	28 February 1999
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1 Scope

This European Telecommunication Standard (ETS) defines the stage 1 specifications of the Supplementary Service Access Priority (SS-AP) for the Terrestrial Trunked Radio (TETRA). 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 interworking considerations.

Charging principles are outside the scope of this ETS.

The SS-AP enables to define specific priorities in an MS for uplink random access messages (at the air interface) for circuit mode or packet mode communications.

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 Z.100 (1993): "Specification and Description Language (SDL)".

[3] ETS 300 392-2 (1996): "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".

3 Definitions and abbreviations

3.1 Definitions

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

access control: The prevention of unauthorized use of resources, including the use of a resource in an unauthorized manner.

access priority level: A specific PDU priority level defined for an MS by SS-AP for a given primitive access priority (low or high, see clause 11 of ETS 300 392-2 [3]) and for a given service. The possible services are: circuit mode services (whether invoked as individual calls or as group calls), SDS, CONS, SCLNS and supplementary services management.

served user: The user making a request for service.

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.

3.2 Abbreviations

3.2.1 General abbreviations

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

GTSI	Group TETRA Subscriber Identity
ISDN	Integrated Services Digital Network
ITSI	Individual TETRA Subscriber Identity
MS	Mobile Station
SDL	(Functional) Specification and Description Language
SDS	Short Data Service
SS	Supplementary Service

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

SwMI	Switching and Management Infrastructure
TETRA	Terrestrial Trunked Radio

3.2.2 Supplementary service abbreviations

For the purposes of this ETS, the following supplementary service abbreviations apply:

SS-AL	Ambience Listening
SS-AoC	Advice of Charge
SS-AP	Access Priority
APL	Access Priority Level
SS-AS	Area Selection
SS-BIC	Barring of Incoming Calls
SS-BOC	Barring of Outgoing Calls
SS-CAD	Call Authorized by Dispatcher
SS-CCBS	Call Completion to Busy Subscriber
SS-CCNR	Call Completion on No Reply
SS-CFB	Call Forwarding on Busy
SS-CFNRy	Call Forwarding on No Reply
SS-CFNRc	Call Forwarding on Not Reachable
SS-CFU	Call Forwarding Unconditional
SS-CLIP	Calling Line Identification Presentation
SS-CLIR	Calling/Connected Line Identification Restriction
SS-COLP	Connected Line Identification Presentation
SS-CR	Call Report
SS-CRT	Call Retention
SS-CW	Call Waiting
SS-DGNA	Dynamic Group Number Assignment
SS-DL	Discreet Listening
SS-HOLD	Call Hold
SS-IC	Include Call
SS-LE	Late Entry
SS-LSC	List Search Call
SS-PC	Priority Call
SS-PPC	Pre-emptive Priority Call
SS-SNA	Short Number Addressing
SS-TC	Transfer of Control
SS-TPI	Talking Party Identification

4 Supplementary Service Access Priority (SS-AP) stage 1 specification

4.1 Description

4.1.1 General description

SS-AP enables the user to gain access to the TETRA system in times of radio link congestion. Preferential treatment shall apply to the uplink access.

The Access Priority Level (APL) range is normally stored in the database within the Mobile Station (MS), and an APL is attached to the Layer 3 messages by the Layer 3 Control Entities when sending uplink messages. The APL should be examined by the Layer 2 Entities when making decisions to send the layer 3 messages.

The APLs for low and high access priority in an MS may be changed by the Switching and Management Infrastructure (SwMI) due to a definition by authorized user and the served user may select between low, high or emergency access priority.

The APL may be different depending upon the service required.

The network may store the value of the APL assigned to the Individual TETRA Subscriber Identity (ITSI) and/or Group TETRA Subscriber Identity (GTSI) and/or call types.

The SwMI supporting SS-AP shall periodically broadcast APL in order to control which mobiles are permitted to make an uplink access attempt. Each mobile operating on a SwMI shall user either default APLs or APLs assigned by the SwMI. In a typical scenario there may be eight access priority levels, each one in turn giving an enhanced performance in times of radio access congestion.

Under normal circumstances when there is no congestion, all mobiles shall be permitted to make access attempts to the SwMI. If the SwMI wishes to regulate random access attempts it shall broadcast a change of APL. A user wishing to establish a call (or transfer information to the SwMI), under these circumstances, shall firstly compare the broadcast message with his own APL. If the user's APL is greater than or equal to the broadcast APL, then he shall be able to make an initial call set-up attempt (or start of information transfer). If the user's APL is less than the broadcast APL then he shall not be make an initial call set-up attempt (or start of information transfer) at that time and shall wait until the network changes the APL to an acceptable value.

4.1.2 Qualifications on applicability to telecommunication services

This supplementary service shall be applicable to all TETRA circuit mode teleservices, circuit mode bearer services, packet mode data services, Short Data Services (SDS) and supplementary services management.

4.2 Procedures

4.2.1 Provision and withdrawal

Provision and withdrawal of SS-AP shall be by pre-arrangement with the service provider.

SS-AP shall be on a per TETRA number (ITSI/GTSI) basis. For each ITSI family in an MS, the supplementary service may be provided by subscription for every service subscribed to at that ITSI, or for only some of the services subscribed to at that ITSI.

4.2.2 Normal procedures

4.2.2.1 Activation and deactivation

SS-AP shall be permanently activated in all MSs and SS-AP may be activated by the service provider upon provision and deactivated upon withdrawal in SwMIs. The activated APL shall be stored within the MS and may be stored within the SwMI.

4.2.2.2 Definition

An authorized user may define the APL for the served user, e.g. as a dispatcher operation.

4.2.2.3 Registration

The SwMI may support the registration of authorized users who may be allowed to carry out definition and/or interrogation of the supplementary service for the served user. The registration process shall include the ITSI jurisdiction of the authorized user.

4.2.2.4 Interrogation

The SwMI may provide interrogation by an authorized user.

If interrogation is provided, a SwMI shall support interrogation on a per number basis for all TETRA services as defined previously.

The SwMI response to an interrogation request shall provide the to the user APLs for low and high access priority per service.

A user may locally interrogate its current APL as stored into the MS. Details of the local interrogation are outside the scope of this ETS.

4.2.2.5 Cancellation

Cancellation is not be applicable.

4.2.2.6 Invocation and operation

The SwMI shall invoke SS-AP by sending APL in a downlink broadcast message. MS shall save the current APL for operation.

In the instance where there is no congestion across the air interface, the SwMI broadcasts an APL that allows the served user to access services over the air interface in the normal manner.

When the uplink radio access resources have become congested, the SwMI may change the broadcasted APL, depending upon the degree of congestion, or upon a pre-determined user/operator agreement, such as a minimum occupancy level.

A served user wishing to establish a call, may select a priority level either low, high or emergency for the service request. The MS shall select the corresponding MS's APL and then shall compare it with the broadcast APL. If the MS's APL is greater than or equal to the broadcast APL, then the MS shall be able to make an initial service access attempt. If the MS's APL is less than the broadcast APL then the MS shall not be able to make an initial service access attempt at that time and shall wait until the SwMI changes the broadcast APL. An indication may be returned to the served user if access has been denied.

A user who has already established a connection when the broadcast APL changes shall be less affected than a user setting up a new call.

4.2.3 Exceptional procedures

4.2.3.1 Activation and deactivation

Exception procedures shall not apply.

4.2.3.2 Definition

An exceptional definition may occur when the authorized user tries to define a high APL but has not subscribed to it. In such a circumstance, the authorized user shall receive a notification that the definition has been disallowed and given the reason such as:

- user not authorized;
- unknown TETRA identity.

4.2.3.3 Registration

Exceptional procedures for registration shall not apply.

4.2.3.4 Interrogation

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

- user not authorized;
- unknown TETRA identity.

4.2.3.5 Cancellation

Cancellation is not applicable.

4.2.3.6 Invocation and operation

An exceptional condition may arise when the MS attempts to make an initial call attempt without having the appropriate APL. In such circumstances the SwMI may re-define proper APLs to MS.

4.3 Interactions with other supplementary services

Interactions with other TETRA supplementary services are specified in subclauses 4.3.1 to 4.3.30.

4.3.1 Calling Line Identification Presentation (SS-CLIP)

SS-AP shall not have any interaction with SS-CLIP.

4.3.2 Connected Line identification Presentation (SS-COLP)

SS-AP shall not have any interaction with SS-COLP.

4.3.3 Calling/Connected Line Identification Restriction (SS-CLIR)

SS-AP shall not have any interaction with SS-CLIR.

4.3.4 Call Report (SS-CR)

SS-AP shall not have any interaction with SS-CR.

4.3.5 Talking Party Identification (SS-TPI)

SS-AP shall not have any interaction with SS-TPI.

4.3.6 Call Forwarding Unconditional (SS-CFU)

SS-AP shall not have any interaction with SS-CFU.

4.3.7 Call Forwarding on Busy (SS-CFB)

SS-AP shall not have any interaction with SS-CFB.

4.3.8 Call Forwarding on No Reply (SS-CFNRy)

SS-AP shall not have any interaction with SS-CFNRy.

4.3.9 Call Forwarding on Not Reachable (SS-CFNRc)

SS-AP shall not have any interaction with SS-CFNRc.

4.3.10 List Search Call (SS-LSC)

SS-AP shall not have any interaction with SS-LSC.

4.3.11 Call Authorized by Dispatcher (SS-CAD)

SS-AP shall not have any interaction with SS-CAD.

4.3.12 Short Number Addressing (SS-SNA)

SS-AP shall not have any interaction with SS-SNA.

4.3.13 Area Selection (SS-AS)

SS-AP shall not have any interaction with SS-AS.

4.3.14 Access Priority (SS-AP)

Not applicable.

4.3.15 Priority Call (SS-PC)

SS-AP shall not have any interaction with SS-PC.

4.3.16 Call Waiting (SS-CW)

SS-AP shall not have any interaction with SS-CW.

4.3.17 Call Hold (SS-HOLD)

SS-AP shall not have any interaction with SS-HOLD.

4.3.18 Call Completion to Busy Subscriber (SS-CCBS)

SS-AP shall not have any interaction with SS-CCBS.

4.3.19 Late Entry (SS-LE)

SS-AP shall not have any interaction with SS-LE.

4.3.20 Transfer of Control (SS-TC)

SS-AP shall not have any interaction with SS-TC.

4.3.21 Pre-emptive Priority Call (SS-PPC)

The PPC should apply the highest APL.

4.3.22 Include Call (SS-IC)

SS-AP shall not have any interaction with SS-IC.

4.3.23 Advice of Charge (SS-AoC)

SS-AP shall not have any interaction with SS-AoC.

4.3.24 Barring of Outgoing Calls (SS-BOC)

SS-AP shall not have any interaction with SS-BOC.

4.3.25 Barring of Incoming Calls (SS-BIC)

SS-AP shall not have any interaction with SS-BIC.

4.3.26 Discreet Listening (SS-DL)

SS-AP shall not have any interaction with SS-DL.

4.3.27 Ambience Listening (SS-AL)

SS-AP shall not have any interaction with SS-AL.

4.3.28 Dynamic Group Number Assignment (DGNA)

SS-AP shall not have any interaction with SS-DGNA.

4.3.29 Call Completion on No Reply (SS-CCNR)

SS-AP shall not have any interaction with SS-CCNR.

4.3.30 Call Retention (SS-CRT)

SS-AP shall not have any interaction with SS-CRT.

4.4 Interworking considerations

When MS moves to another SwMI, it shall use default APLs until new APLs may be downloaded to it in that SwMI.

4.5 Overall SDL

Figure 1 contains the dynamic description of SS-AP using the Specification Description Language (SDL) defined in ITU-T Recommendation Z.100 [2]. The SDL process represents the behaviour of an MS in a network providing SS-AP.

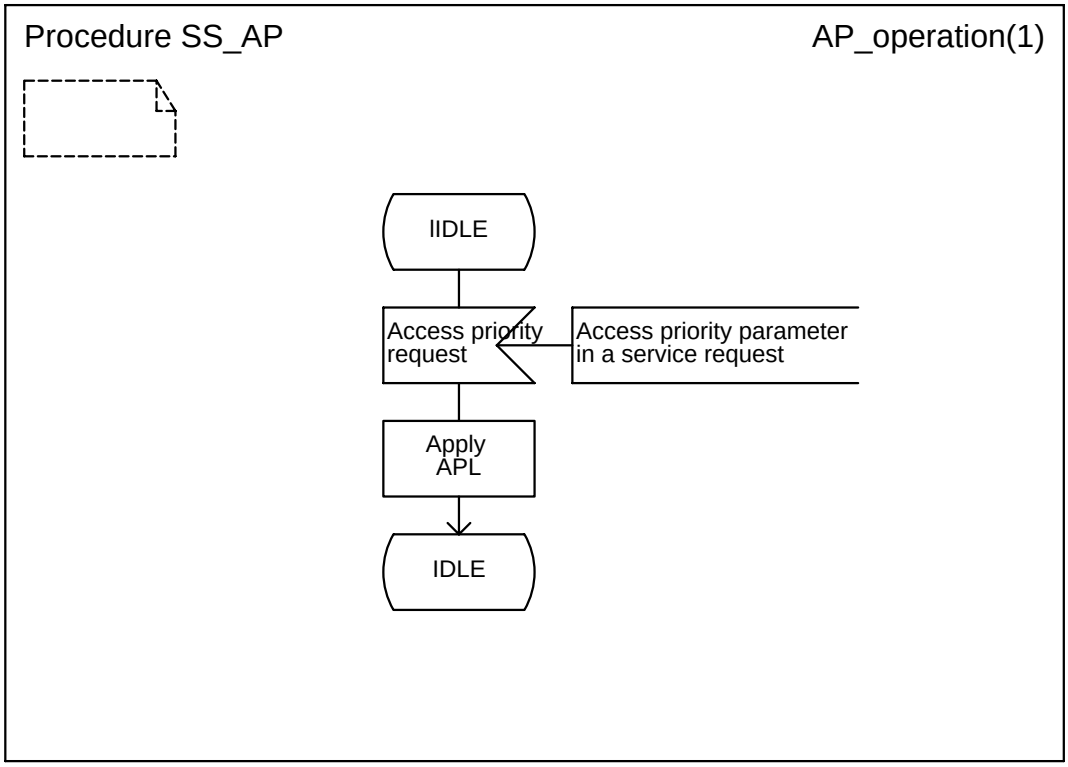

Figure 1: SS-AP supplementary service, overall MS SDL

History

Document history	
April 1996	First Edition
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