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Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 13: Call completion to busy subscriber

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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".

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1 Scope

This ETS specifies the Call Completion on Busy Subscriber (SS-CCBS) supplementary service which is applicable to various basic services supported by TETRA Switching and Management Infrastructures (SwMIs). TETRA basic services are specified in ETS 300 392-2 [8].

SS-CCBS allows completion of a call to a subscriber that was unsuccessful because of a busy condition without making a new call attempt.

Supplementary service specifications are produced in three stages, according to the method described in ITU-T Recommendation I.210 [4]. This ETS contains the stage 1 specifications of SS-CCBS. The stage 1 descriptions specify the supplementary services as seen by users of SwMIs.

This ETS is applicable to circuit mode TETRA tele-services and bearer services only. This ETS does not address the case where the MS/LS is not reachable. SS-CCBS assumes MS/LS is reachable.

Man Machine Interfaces and charging principles are outside the scope of this ETS.

This first edition of this ETS was presented as a delta document to the first edition of ECMA-185 [2]. This version has been redrafted based on the latest published text of ECMA-185 [2] as a self-contained document so as to be more readable. Additions to ECMA-185 [2] have been made to take into account particular TETRA specifics (e.g. group call) and to include user requirements and situations not addressed in ECMA-185 [2].

NOTE: Contrary to PISN SS-CCBS and SS-CCNR which are both specified in ECMA-185 [2], TETRA SS-CCBS and TETRA SS-CCNR are specified in two separate ETSs.

2 References

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This ETS incorporates by dated and undated reference, provisions from other publications. These 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.

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[1] Void.

[2] Standard ECMA-185 (1997): "Private Integrated Services Network (PISN); Specification, Functional Model and Information Flows; Call Completion Supplementary Services (CCSD)".

[3] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".

[4] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

[5] ITU-T Recommendation I.221 (1993): "Common specific characteristics of services".

[6] ITU-T Recommendation Z.100 (1993): "CCITT specification and description language (SDL)".

[7] Void.

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

[9] ETS 300 392-9 (1997): "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".

[10] CCITT Recommandation Q.9 (1988): "Vocabulary of switching and signalling terms".

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[11] TS 101 282: "Digital cellular telecommunications system (Phase 2+); Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1 (GSM 02.93 version 6.0.1 Release 1997)".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Additional Network Feature: Capability, over and above that of a basic service, provided by a SwMI, but not directly to a user.

basic (…) service: Any stand alone bearer service or tele-service (derived from ITU-T Recommendation I.210 [4]).

bearer service: type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces (as defined in ITU-T Recommendation I.112 [3]).

busy: Property of a user for whom either a "network determined user busy" or "user determined user busy" condition (see subclause 3.1 of ITU-T Recommendation I.221 [5]) exists.

call, basic call: Instance of the use of a basic service.

call completion: Successful presentation of a previously unsuccessful Call to a destination user (user B) which occurs when the call has entered an alerting phase or has been answered.

NOTE 1: CCBS call completion could result in a CCNR condition in which case user A would invoke SS-CCNR and not SS-CCBS anymore.

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CCBS busy: Any one of the following conditions will cause user A to be considered as CCBS busy:

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- maximum number of calls queued at user A;
- CCBS recall pending on user A;
- no resource available at user A.

NOTE 2: It is assumed that SS-CCNR busy is independent from SS-CCBS busy; one could consider merging the two conditions in an SS-CC busy which would combine the total numbers of CCBS and CCNR requests.

compatible MS/LS: MS/LS presenting the same basic TETRA class of service as the TETRA class of service requested by the calling user MS/LS. By analogy to ISDN "compatible terminal".

free: Property of a user who can accept any attempt by the SwMI to present a call to that user (i.e. allow the call to reach the alerting or answered state).

group busy: group is busy when group controlling SwMI determines that group is busy; group busy shall generally be equivalent to NDUB.

NOTE 3: How the SwMi determines group busy condition is implementation dependent and is outside the scope of this draft ETS.

idle guard time: Time the network will wait after user B has become free before initiating a “CCBS recall” to user A (definition from TS 101 282 [11]).

Line Station (LS): Physical grouping that contains all the fixed equipment that is used to obtain TETRA services through a line.

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).

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Network Determined User Busy: Analogy to ISDN, when all available interface resources are busy, the busy shall be network determined user busy.

path reservation: Reservation of resources just prior to SS-CCBS Recall in order that a connection path through the network is available when user A accepts the SS-CCBS Recall.

NOTE 4: Path Reservation would not guarantee that user B will be free when user A accepts the SS-CCBS Recall.

NOTE 5: Path Reservation is not the preferred mode of operation in the TERA environment due to mobility considerations.

recall timer: Timer specifies the length of time the network shall wait for a response from user A to a CC Recall.

retention timer: Timer specifies the period of time the network retains the originating call information after a valid call attempt is released.

SS-CCBS busy: See CCBS busy.

SS-CCBS call: Call generated by the network from user A to user B resulting from user A's acceptance of a SS-CCBS recall.

SS-CCBS recall: Indication informing user A that user B is no longer busy (in the case of SS-CCBS). Acceptance of this indication by user A will cause the call to be completed by the SwMI.

SS-CCBS request: Instance of an activation of SS-CCBS held in a queue pending the correct conditions for the SS-CCBS to be completed.

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SS-CCBS service duration timer: Timer specifies the length of time that the service shall be active within the network.

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supplementary service: Any service provided by a network in addition to its basic service or services (defined in CCITT Recommendation Q.9 [10]). A supplementary service modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a stand alone service. It must be offered together with or in association with a basic telecommunication service (except from ITU-T Recommendation I.210 [4]).

suspended CCBS request: CCBS request that cannot be served even if destination B is not busy, because user A is busy or CCBS busy.

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.

tele-service: Type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols.

User A: Specific user that originated the call and requested the supplementary service.

User B: User that was initially addressed in the original individual call set up. In the case of a group call, Group (B) will be used in place of user B.

user B idle guard timer: See idle guard timer definition.

User Determined User Busy: Analogy to ISDN, busy shall be user determined user busy when subscriber resources (either the terminal itself or the user) do not respond positively to an incoming call request.

NOTE 6: In the case where the MS/LS has a single resource and is involved in an individual call, UDUB and NDUB will be confounded. In other words, NDUB could result of a single call occurrence.