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Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 11: Supplementary services stage 2; Sub-part 16: Pre-emptive Priority Call (PPC)

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Terrestrial Trunked Radio (TETRA).

The present document is part 11, sub-part 16 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

EN 300 392-1: "General network design";

EN 300 392-2: "Air Interface (AI)";

EN 300 392-3: "Interworking at the Inter-System Interface (ISI)";

ETS 300 392-4: "Gateways basic operation";

EN 300 392-5: "Peripheral Equipment Interface (PEI)";

EN 300 392-7: "Security";

EN 300 392-9: "General requirements for supplementary services";

EN 300 392-10: "Supplementary services stage 1";

EN 300 392-11: "Supplementary services stage 2";

- Sub-part 1: "Call Identification (CI)";
- Sub-part 2: "Call Report (CR)";
- Sub-part 3: "Talking Party Identification (TPI)";
- Sub-part 4: "Call Forwarding (CF)";
- Sub-part 5: "List Search Call (LSC)";
- Sub-part 6: "Call Authorized by Dispatcher (CAD)";
- Sub-part 7: "Short Number Addressing (SNA)";
- Sub-part 8: "Area Selection (AS)";
- Sub-part 9: "Access Priority (AP)";
- Sub-part 10: "Priority Call (PC)";
- Sub-part 11: "Call Waiting (CW)";
- Sub-part 12: "Call Hold (HOLD)";
- Sub-part 13: "Call Completion to Busy Subscriber (CCBS)";

Sub-part 14: "Late Entry (LE)";

Sub-part 16: "Pre-emptive Priority Call (PPC)";

Sub-part 17: "Include Call (IC)";

Sub-part 18: "Barring of Outgoing Calls (BOC)";

Sub-part 19: "Barring of Incoming Calls (BIC)";

Sub-part 20: "Discreet Listening (DL)";

Sub-part 21: "Ambience Listening (AL)";

Sub-part 22: "Dynamic Group Number Assignment (DGNA)";

Sub-part 23: "Call Completion on No Reply (CCNR)";

Sub-part 24: "Call Retention (CRT)";

EN 300 392-12: "Supplementary services stage 3";

ETS 300 392-13: "SDL model of the Air Interface (AI)";

ETS 300 392-14: "Protocol Implementation Conformance Statement (PICS) proforma specification";

TS 100 392-15: "TETRA frequency bands, duplex spacings and channel numbering";

TS 100 392-16: "Network Performance Metrics";

TS 100 392-17: "TETRA V+D and DMO Release 1.1 specifications".

NOTE: Part 13 (SDL) and part 14 (PICS) of this multi-part are of status "historical" and will not be updated according to this version of the standard.

National transposition dates	
Date of adoption of this EN:	17 September 2004
Date of latest announcement of this EN (doa):	31 December 2004
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 June 2005
Date of withdrawal of any conflicting National Standard (dow):	30 June 2005

1 Scope

The present document defines the stage 2 specifications of the Supplementary Service Pre-emptive Priority Call (SS-PPC) for the TErrestrial Trunked Radio (TETRA).

SS-PPC enables a user to have preferential access to the network resources in a TETRA system in times of congestion including pre-emption of calls. SS-PPC is applicable for pre-emptive priorities including the emergency priority. SS-PPC includes the capability to pre-empt resources needed for higher priority calls and the capability to pre-empt users from ongoing calls in order to move them to higher priority calls. SS-PPC specifies the definition, activation, deactivation and interrogation for the usage of pre-emptive call priorities in the TETRA system. The Switching and Management Infrastructure (SwMI) applies the SS-PPC priorities when it allocates the resources for calls. The SS-PPC operations are defined for the SwMI and for the Mobile Station (MS).

SS-PPC is defined to subscribers of one TETRA system, but the subscribers may be located in several TETRA systems and the information flows may be delivered over the Inter-System Interface (ISI). SS-PPC also is invoked for calls within one TETRA system or for calls that extend over ISI to several TETRA systems.

Man-Machine Interface (MMI) and charging principles are outside the scope of the present document.

Stage 2 describes the functional capabilities of the Supplementary Service introduced in stage 1 description. Stage 2 identifies the functional capabilities for the management and operation of the service in the SwMI and in the MS. Stage 2 describes also the information flows exchanged between these entities and the flows sent over the ISI.

NOTE: The stage 2 description is followed by the stage 3 description, which specifies the encoding rules for the information flows and process behaviour for the different entities in the SwMI and in the MS.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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

[2] ETSI EN 300 392-10-16: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 16: Pre-emptive Priority Call (PC)".

[3] ETSI EN 300 392-12-16: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 16: Pre-emptive Priority Call (PPC)".

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

[5] ETSI EN 300 392-3-3: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 3: Additional Network Feature Group Call (ANF-ISIGC)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

authorized user: user who is authorized to define, activate, deactivate and interrogate the SS-PPC

emergency priority: highest pre-emptive priority

pre-emption: exclusion of one or more parties from an ongoing service due to a SS-PPC operation for another service

NOTE: The pre-emption is carried out due to the lack of resources or due to the need to join a called party to a higher priority pre-emptive call. The users may be warned of the impending pre-emption or indicated, if any party is pre-empted from the ongoing call.

user A: calling party, the party that invokes or generates invocation of SS-PPC

user B: called party in a call in which SS-PPC is operated

NOTE: The called user may be pre-empted user from another call.

user C: pre-empted user, a user that is involved in a call, which is pre-empted due to lack of resources for a SS-PPC

NOTE: There may be one, two or more pre-empted users in a pre-empted call.

user D: remaining user or users in a call from which a user or users have been pre-emptied

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CC	Call Control functional entity
CCA	Call Control functional entity Agent
CRV	Call Retention Value
CMCE	Circuit Mode Control Entity
FE	Functional Entity
ISI	Inter-System Interface
LS	Line connected Station
MMI	Man-Machine Interface
MS	Mobile Station
PDU	Protocol Data Unit
SS-PPC	Supplementary Service Pre-emptive Priority Call
SwMI	Switching and Management Infrastructure

4 Functional model

4.1 Functional model description

The functional model describes the functional characteristics of the Functional Entities (FEs) involved in the management and operation of SS-PPC.

The functional model shall comprise the following FEs:

FE1	user A's (calling party's) FE;
FE21	SS-PPC FE in home SwMI or controlling SwMI;

NOTE 1: During definition, activation, deactivation and interrogation request, FE21 may either be user A's home SwMI or a group home SwMI.
During invocation and operation, FE21 will be the controlling SwMI of the pre-emptive priority call that has been initiated.

FE3 authorized user's FE;
FE5 user B's (called party's) FE;

NOTE 2: Called party in a call in which SS-PPC is operated. The called user may be pre-empted party FE8 of another call either due to lack of resources or the user is pre-empted to be joined to the pre-emptive priority call.

FE25 SS-PPC FE in user B's SwMI;
FE8 user C's (pre-empted party's) FE;

NOTE 3: Pre-empted user, a user that is involved in a call which is pre-empted due to lack of resources.

FE9 user D's (remaining party's) FE;

NOTE 4: Remaining user or users in a call from which a user or users have been pre-emptied.

CC Call Control FE in SwMI.
CCA Call Control Agent FE in MS/LS.

NOTE 5: The above FEs has been numbered in accordance with EN 300 392-9 [4].

The following relationships shall exist between these FEs:

ra between FE1 and FE21/FE25;
rb between FE21 and FE25;
rc between FE21 and FE3;
rd between FE21/FE25 and FE5;
re between FE21/FE25 and FE8;
rf between FE21/FE25 and FE9.

Figure 1 shows these FEs and the possible relationships for the management part and figure 2 for the operational part.

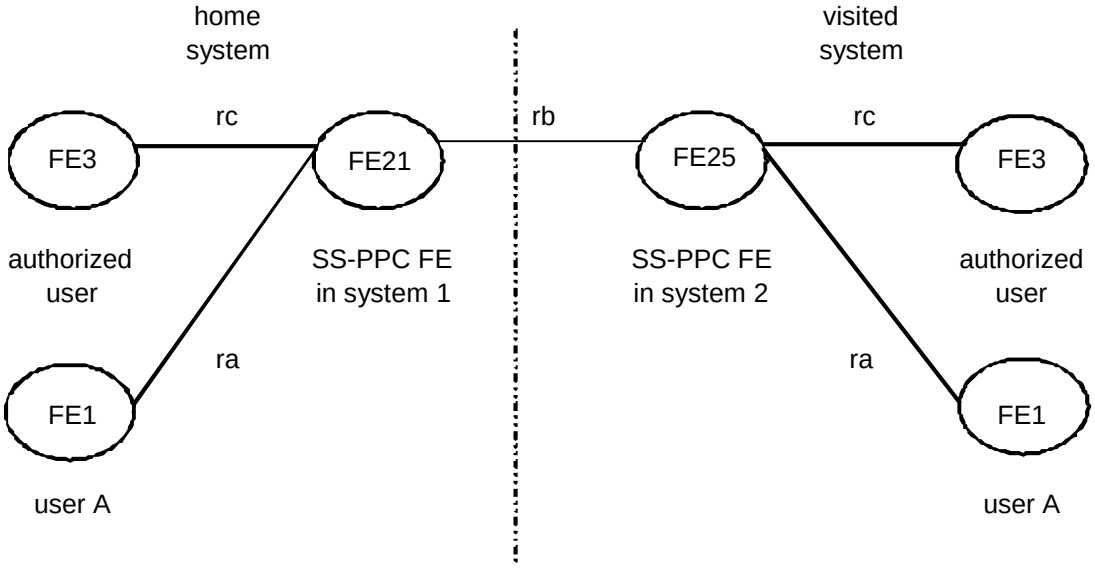

Figure 1: The relations and the FEs of the management part of SS-PPC

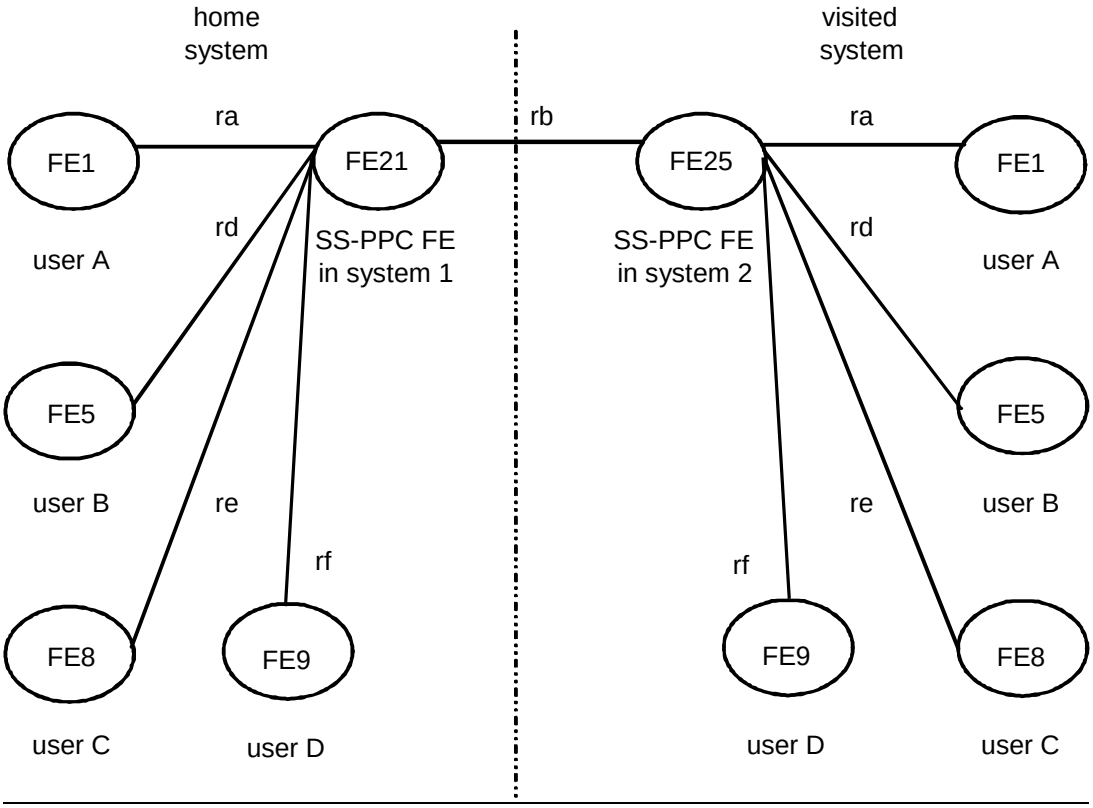

Figure 2: The relations and FEs of the operational part of SS-PPC

4.2 Description of functional entities

4.2.1 User A's FE, FE1

The functional tasks of FE1 for definition and interrogation shall be the following:

- as an option, the MS/LS may support reception of SS-PPC definition from FE21. Upon acceptance, FE1 shall pass the SS-PPC definition request, to the user application and acknowledge the SS-PPC definition, if FE21 has requested this;
- as an option, the MS/LS supports SS-PPC interrogation, FE1 shall pass the SS-PPC interrogation request to FE21, when the user application issues it.

The functional tasks for operation of FE1 for pre-emptive priority individual and group call request shall be as follows:

- upon reception of the SS-PPC invocation from the user application within a call set-up, FE1 shall send the SS-PPC invocation to the SwMI (FE21) with the call set-up;
- upon reception of a SS-PPC confirmation from FE21, FE1 shall pass the SS-PPC confirmation to the user application.

4.2.2 SS-PPC FE in the individual or group home SwMI, FE21

The functional tasks of FE21 for definition, activation, deactivation and interrogation shall be the following:

- as an option, FE21 supports SS-PPC definition, FE21 shall verify these request when received from FE3 and if found valid, save this information and acknowledge it to FE3;
- as an option, FE21 supports SS-PPC activation or deactivation, FE21 shall verify these request when received from FE3 and if found valid, save this information and acknowledge it to FE3;