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Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 11: Supplementary services stage 2; Sub-part 17: Include Call (IC)

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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 17 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

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 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";

Part 15: "TETRA frequency bands, duplex spacings and channel numbering";

Part 16: "Network Performance Metrics";

Part 17: "TETRA V+D and DMO Release 1.1 specifications".

National transposition dates	
Date of adoption of this EN:	11 January 2002
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Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 October 2002
Date of withdrawal of any conflicting National Standard (dow):	31 October 2002

1 Scope

The present document specifies the stage 2 description of the Supplementary Service Include Call (SS-IC) for the Terrestrial Trunked Radio (TETRA).

SS-IC enables a served user, while already participating in an active call (original call) to include new participant(s) into a group call together with the participant(s) in the original call.

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

Supplementary service specifications are produced in three stages according to the method defined in ITU-T Recommendation I.130 [1]. The stage 2 description identifies the functional capabilities and the information flows needed to support the supplementary service as specified in its stage 1 description (see ETS 300 392-10-17 [7]). 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.

The present document is applicable to TETRA Voice plus Data terminal equipment and networks.

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.

[1] ITU-T Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

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

[3] ETSI EN 300 392-3-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 2: Additional Network Feature Individual Call (ANF-ISIIC)".

[4] ETSI ETS 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)".

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

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

[7] ETSI ETS 300 392-10-17: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 17: Include call".

[8] ETSI EN 300 392-12-17: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 17: Include Call (IC)".

[9] ISO/IEC 11574: "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode 64 kbit/s bearer services - Service description, functional capabilities and information flows".

3 Definitions and abbreviations

3.1 Definitions

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

affected user: user or users included in the original call

NOTE: The original call may be either a group call or an individual call but the resulting call is a group call.

affected user SwMI: any SwMI where an affected user is currently registered

another user: any other than server user in the original call to which new users will be included

another user SwMI: any SwMI where another user is currently registered

original call: the call already established in which the served user participates and which will be included in a group call together with new participant added by the served user

In addition, the terms and definitions of EN 300 392-9 [6] apply with the following modifications:

served user: user already participating in a call and who invokes the SS-IC supplementary service

served user SwMI: SwMI where the served user is currently registered

NOTE: The served user SwMI will be the group controlling SwMI of the resulting group call.

3.2 Abbreviations

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

ANF-ISIMM	Additional Network Feature - Inter-System Interface Mobility Management
ANF-ISIGC	Additional Network Feature - Inter-System Interface Group Call
ANF-ISIIC	Additional Network Feature - Inter-System Interface Individual Call
CC	Basic Service Call Control functional entity
CCA	Basic Service Call Control functional entity agent

NOTE: CC and CCA are applied as defined in ISO/IEC 11574 [9].

IC	Include Call
FE	Functional Entity
ISI	Inter-System Interface
LS	Line Station
MS	Mobile Station
SDL	Specification and Description Language
SS	Supplementary Service

NOTE: The abbreviation SS is only used when referring to a specific supplementary service (e.g. SS-IC).

SwMI	Switching and Management Infrastructure

4 Functional model

4.1 Functional model description

The functional model shall comprise the following Functional Entities (FEs):

FE1	Served user functional entity;
FE2	Generic combination of FE21, FE22, FE23 and FE25;
FE21	Served user SwMI individual call FE;
FE22	Group controlling SwMI FE;
FE23	Another party SwMI in the original call;
FE25	Affected user SwMI FE;
FE3	Another party in the original call;
FE5	Affected user FE (included user).

The following relationships shall exist:

ra	between FE1 and FE21/FE22;
rb	between FE23/FE25 and FE3;
rc	between FE25/FE23 and FE5/FE3;
rd	between FE21/FE22 and FE23/FE25;
re	between FE21/FE25 and FE25/FE23.

Figure 1 shows these FEs and relationships. Figure 2 shows simplified FE model and relationships.

NOTE: Functional entity FE2 is a combination of FE21, FE22 and FE25

Figure 1: Functional model for the basic operational part of SS-IC

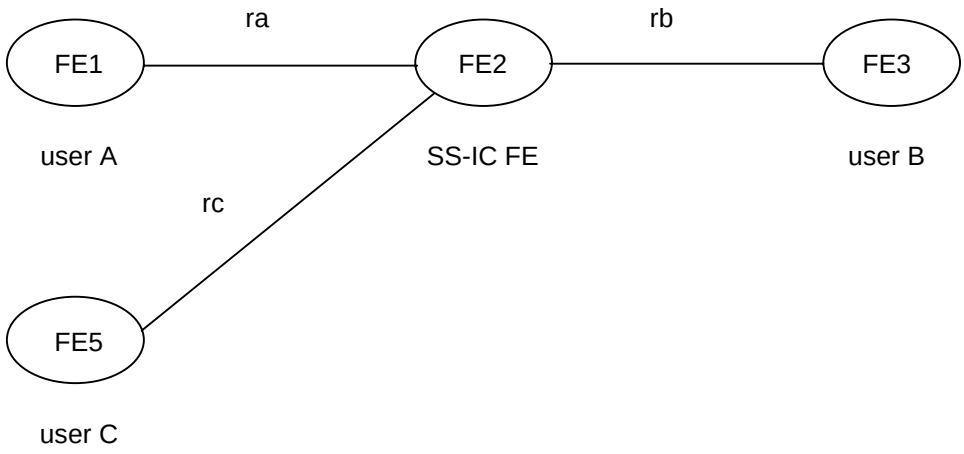

Figure 2: Functional model for the basic operation in a single SwMI

4.2 Description of functional entities

4.2.1 Served user functional entity, FE1

FE1 is the functional entity which serves the served user for the invocation of SS-IC.

4.2.2 Served user SwMI functional entity, FE21

When it receives a SS-IC invocation from FE1, FE21 checks whether SS-IC has been subscribed and, if yes, sets a second call to the included party FE5 and requests FE22 to include the original call and the second call (into a group call).

4.2.3 Group controlling SwMI functional entity, FE22

When informed by FE21 that SS-IC has been invoked FE22 includes all participants in the original call and the second call into a single group call.

4.2.4 Other party SwMI functional entity, FE23

FE23 receives from FE22 the information that SS-IC has been operated for the call and passes it to the other party FE3 entity and modifies the call into a group call, when necessary.

4.2.5 Affected user SwMI functional entity, FE25

FE25 may receive from FE21 information that SS-IC has been invoked (by the served user) for an individual user inclusion for FE5 availability checking. In that case during SS-IC operation FE25 receives from FE22 a call modification into a group call and passes it to the affected user entity FE5. FE25 may also receive from FE21 information that SS-IC has been invoked for a group inclusion. In both cases the FE25 performs call set-up to FE5 and informs that the call is an include call. After the inclusion FE25 ceases to exist and FE23 is invoked for the call to serve for any new SS-IC functions.

4.2.6 Other party functional entity, FE3

FE3 is the functional entity which serves the other party in the original call to inform him that new participants are included into the current call.

4.2.7 Affected user functional entity, FE5

FE5 is the functional entity which serves the affected user to inform him that the call contains more participants than the calling user or the group identity implies (as a result of SS-IC operation). Once the SS-IC operation is completed FE5 ceases to exist and the FE3 serves the other party for any new SS-IC actions.

4.3 Relationship of functional model to basic call functional model

Although no formal model has been defined for basic individual call, that model can be readily derived from the PISN model for basic call, in ISO/IEC 11574 [9].

FE1 shall be collocated with the two-served user CCAs, in the original call and the second call.

FE21 shall be collocated with the CC functional entities in the served user SwMI for the original call and the second call.

FE22 shall be collocated with the CC functional entity in the group controlling SwMI for the group call resulting from SS-IC operation.

FE23 shall be collocated with the CC functional entity in the other party SwMI for the call in which that user participates (the original call). In the specific case where the affected user participates in both the original call and the second call, FE23 shall be collocated with the CC functional entities for each of these calls.

FE3 shall be collocated with the CCA of the other party for the original call in which that user participates. In the specific case where the other party participates in both the original call and the second call, FE3 shall be collocated with the CCAs for each of these calls.

FE25 shall be collocated with the CC functional entity in the affected user SwMI for the call in which that user participates (the original call or the second call). In the specific case where the affected user participates in both the original call and the second call, FE25 shall be collocated with the CC functional entities for each of these calls.

FE5 shall be collocated with the CCA of the affected user for the call in which that user participates. In the specific case where the affected user participates in both the original call and the second call, FE5 shall be collocated with the CCAs for each of these calls.

NOTE: Obviously the specific case where the affected user participates in both the original call and the second call cannot happen when both of these calls are individual calls.

Figure 3 shows relationship between SS-IC and the basic calls.

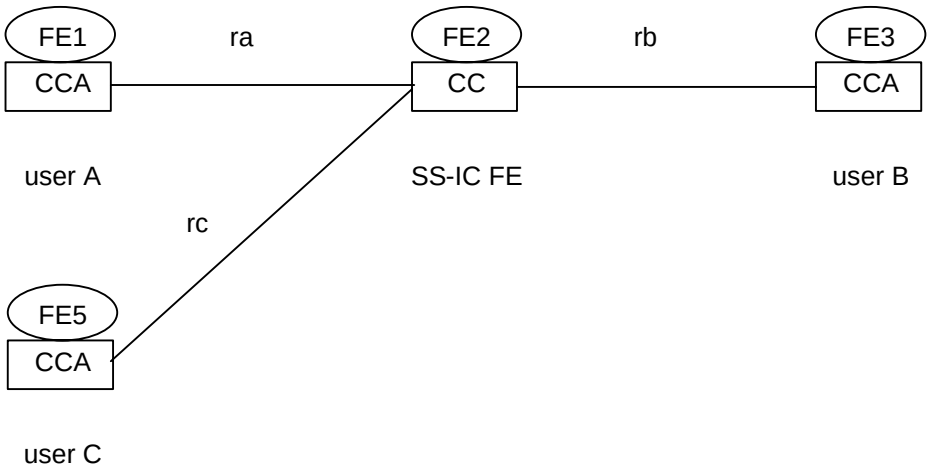

Figure 3: Relationship between models for SS-IC and basic call