Final draft ETSI EN 300 392-12-3 V1.3.0 (2005-12)

European Standard (Telecommunications series)

Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 12: Supplementary services stage 3;
Sub-part 3: Talking Party Identification (TPI)

Reference

REN/TETRA-03167

Keywords

air interface, TETRA, V+D

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Sous-Préfecture de Grasse (06) N° 7803/88

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Contents

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Terrestrial Trunked Radio (TETRA), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document is part 12, subpart 3 of a multi-part deliverable covering the 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";

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

EN 300 392-12-1:   "Call Identification (CI)";

ETS 300 392-12-2:   "Call Report (CR)";

EN 300 392-12-3:   "Talking Party Identification (TPI)";

EN 300 392-12-4:   "Call Forwarding (CF)";

ETS 300 392-12-5:   "List Search Call (LSC)";

EN 300 392-12-6:   "Call Authorized by Dispatcher (CAD)";

ETS 300 392-12-7:   "Short Number Addressing (SNA)";

EN 300 392-12-8:   "Area Selection (AS)";

ETS 300 392-12-9:   "Access Priority (AP)";

EN 300 392-12-10:   "Priority Call (PC)";

ETS 300 392-12-11:   "Call Waiting (CW)";

EN 300 392-12-12:   "Call Hold (HOLD)";

ETS 300 392-12-13:   "Call Completion to Busy Subscriber (CCBS)";

EN 300 392-12-14:   "Late Entry (LE)";

EN 300 392-12-16:   "Pre-emptive Priority Call (PPC)";

EN 300 392-12-17:   "Include Call (IC)";

EN 300 392-12-18:   "Barring of Outgoing Calls (BOC)";

EN 300 392-12-19:   "Barring of Incoming Calls (BIC)";

ETS 300 392-12-20:   "Discreet Listening (DL)";

EN 300 392-12-21:   "Ambience Listening (AL)";

EN 300 392-12-22:   "Dynamic Group Number Assignment (DGNA)";

ETS 300 392-12-23:   "Call Completion on No Reply (CCNR)";

ETS 300 392-12-24:   "Call Retention (CRT)";

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";

TR 100 392-17:   "TETRA V+D and DMO specifications";

TS 100 392-18:   "Air interface optimized applications".

NOTE: Part 10, sub-part 15 (Transfer of control), part 13 (SDL) and part 14 (PICS) of this multi-part deliverable are in status "historical" and will not be updated according this version of the standard.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1   Scope

The present document specifies the stage 3 description of the Supplementary Service Talking Party Identification (SS-TPI) for the Terrestrial Trunked Radio (TETRA).

The SS-TPI supplementary service enables the party/parties participating in a call to receive the identification of the talking/sending party. The SS-TPI is activated against individual identity in individual call and against group identity in group calls.

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

The supplementary service stage 3 description is preceded by the stage 1 and the stage 2 description of the service, according to the method described in ITU-T Recommendation I.130 [10]. The stage 1 description specifies the service from the user's point of view. 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. The present stage 3 description specifies the protocols at the air interface and at the various Inter-System Interfaces (ISI) to support SS-TPI.

NOTE: According to ITU-T Recommendation I.130 [10], the stage 3 description of any telecommunication service addresses the network implementation aspects. Consequently it comprises two steps: the specifications of all protocols at the various reference points involved in any of the service procedures (notably the service operation) are the first step of the stage 3 description, and the specifications of the functions of the corresponding network entities are its second step.

The latter have not been provided since they can be derived from the specification of the functional entity actions in the stage 2 description.

The present document is applicable to Voice plus Data individual call or group call; more specifically to the following entities:

- the MS of listening/receiving users during an individual call or a group call;

- to the originating Switching and Management Infrastructures (SwMIs) in an individual call or a group call;

- to the group home SwMI and the participating SwMI for a group call;

- to the terminating SwMI for an individual call;

- and, optionally, to the home SwMI of the group or of the MSs involved, for managing the supplementary service.

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 300 392-3-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 1: General design".

[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 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)".

[5]   ETSI EN 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 300 392-10-3: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D);
             Part 10: Supplementary services stage 1; Sub-part 3: Talking Party Identification (TPI)".

[8]   ETSI ETS 300 392-11-3: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D);
             Part 11: Supplementary services stage 2; Sub-part 3: Talking Party Identification (TPI)".

[9]   ETSI EN 300 392-12-6: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D);
             Part 12: Supplementary services stage 3; Sub-part 6: Call Authorized by Dispatcher (CAD)".

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

[11]   ITU-T Recommendation Z.100: "Specification and Description Language (SDL)".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in EN 300 392-9 [6] and the following apply:

authorized user: identified user who is allowed to define, activate, deactivate and/or interrogate the SS-TPI parameters

served user: listening/receiving party in a call, that receives the SS-TPI information

>   NOTE: In a group call, all parties except the talking/sending party will be served users. In an individual call, if
>   SS-TPI is provided to the calling and the connected users:
>
>   -   if the call is half-duplex, whenever one of the two parties becomes the talking/sending user, the
>   other party is the served user;
>
>   -   if the call is duplex, both of them are served users.

served user SwMI: in the case of an individual call, SwMI where the served user is registered, or in the case of a group call, any SwMI where served users are registered different from the group controlling SwMI

>   NOTE: The protocol specified for the start of the call in the present document for such SwMI applies
>   independently of whether or not the/a served user is registered in that SwMI at that time (i.e. the user
>   registered in that SwMI involved the call may be talking/sending at set-up time, and become served user
>   only later during the call).

talking/sending user: party to whom transmission permission has been granted during a group call or a half-duplex
individual call

talking/sending user SwMI: SwMI where the talking/sending user is registered

NOTE: That definition applies without restriction in the case of an individual call. In the case of a group call, the talking/sending user SwMI exists only when it is different from the group controlling SwMI, The protocol specified for the start of the call in the present document for such SwMI applies independently of whether or not the talking/sending user is registered in that SwMI at that time (i.e. the user registered in that SwMI involved the call may be listening/receiving at set-up time, i.e. thus the/a served user, and become talking/sending user only later during the call).

3.2 Abbreviations

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

ANF-ISIGC Additional Network Feature - Inter-System Interface Group Call
ANF-ISIIC Additional Network Feature - Inter-System Interface Individual Call
ANF-ISIMM Additional Network Feature - Inter-System Interface Mobility Management
ANF-ISISS Additional Network Feature - Inter-System Interface Supplementary Service
CMCE Circuit Mode Control Entity
GTSI Group TETRA Subscriber Identity
ISI Inter-System Interface
ITSI Individual TETRA Subscriber Identity
LS Line Station
MS Mobile Station
PDU Protocol Data Unit
ROSE Remote Operation Service Element
SNA Short Number Address
SS Supplementary Service
SS-CAD Supplementary Service-Call Authorized by Dispatcher
SS-CLIR Supplementary Service-Calling/connected Line Identification Restriction
SS-COLP Supplementary Service-COnnected Line identification Presentation
SSI Short Subscriber Identity
SS-TPI Supplementary Service-Talking Party Identification
SwMI Switching and Management Infrastructure
TNSS-SAP TETRA Network layer Supplementary Services - Service Access Point

4 SS-TPI service description

4.1 General

SS-TPI enables a listening/receiving user in an individual or a group call to be provided with the identity of the talking/sending party, and on an optional basis, with its mnemonic name and/or with the level of priority of its request for transmission grant.

This clause describes SS-TPI specific services offered by the Circuit Mode Control Entity (CMCE) at the Supplementary Services service access point (TNSS-SAP) of the TETRA voice plus data layer 3 service boundary in a TETRA Mobile Station (MS) or TETRA Line Station (LS). The SS-TPI service access point is used in conformance testing as a normative boundary in MSs and LSs.

NOTE: As the present document only deals with the SS-TPI all the service primitives has been shown without a TNSS-TPI-prefix e.g. the TNSS-TPI-ACTIVATE request is shorten into an ACTIVATE request.

4.2 SS-TPI services offered over the TNSSSAP

NOTE 1: As man-machine interface or user applications are outside the scope of the present document service primitives are used to define information exchange to and from the standardized part of the MS. Those primitives may be only indirectly accessible.

The SS-TPI service primitives at the served user MS TNSS-SAP shall be:

-       INFORM indication.

The SS-TPI service primitives at the authorized user MS TNSS-SAP shall be:

-       ACTIVATE request;

-       ACTIVATE indication;

-       DEFINE request;

-       DEFINE indication;

-       INFORM indication;

-       INTERROGATE request;

-       INTERROGATE indication;

-       INTERROGATE BY NAME request;

-       INTERROGATE BY NAME indication.

Any user to whom SS-TPI is provided should have the possibility to use the INTERROGATE primitives mentioned above, limited to its own ITSI and to GTSIs of groups he is member of.

NOTE 2:   Formally, when such user is using the INTERROGATE primitives to know whether SS-TPI has been activated for him, and if yes with which optional subscription parameters, he is acting as a served user. While when he is using those primitives to know his mnemonic name, he is acting as a talking/sending user (since that name is going to be delivered to the served user(s)). However no difference has been made between the two cases, since during a call any user can be in turn a served user and talking/sending user.

4.2.1   ACTIVATE indication

The ACTIVATE indication primitive shall be sent to the user application by the MS CMCE over TNSS-SAP to inform it of the result of a previous ACTIVATE request.

If the previous request has been addressed to a SwMI for more than one identity, that SwMI may send its corresponding response either in one single request which applies to all those identities or in multiple requests.

The ACTIVATE indication primitive shall contain the SS-TPI parameters listed in table 1.

Table 1: Parameters for the primitive ACTIVATE indication

Parameter	Indication
Activation result	M (see note 1)
TETRA identity/identities	M (see note 2)
Activation state	C (see notes 1 and 3)
NOTE 1: There shall be only one activation result and one activation state per indication primitive.	
NOTE 2: It is optional to support more than one identity.	
NOTE 3: Conditional on the activation result.	

4.2.2   ACTIVATE request

The ACTIVATE request primitive shall be sent to the MS CMCE by the user application by over TNSS-SAP to activate SS-TPI.

The activation process shall support one TETRA identity in a request. Optionally it may support a list and/or range of identities. Such identity/identities may be those of either individual users or of groups.

The ACTIVATE request primitive shall contain the SS-TPI parameters listed in table 2.

Table 2: Parameters for the primitive ACTIVATE request

Parameter	Request
Access priority	O
TETRA identity/identities	M (see note 1)
Activation request	M (see note 2)
NOTE 1: It is optional to support more than one identity.	
NOTE 2: There shall be only one activation request per request primitive.	

4.2.3   DEFINE indication

The DEFINE indication primitive shall be sent to the user application by the MS CMCE over TNSS-SAP to inform it of the result of a previous DEFINE request.

If the previous request has been addressed to a SwMI for more than one identity, that SwMI may send its corresponding response either in one single request which applies to all those identities or in multiple requests.

The DEFINE indication primitive shall contain the SS-TPI parameters listed in table 3.

Table 3: Parameters for the primitive DEFINE indication

Parameter	Indication
Definition result	M (see note 1)
TETRA identity/identities	M (see note 2)
Activation state	C (see notes 1 and 3)
NOTE 1: There shall be only one definition result and one activation state per indication primitive.	
NOTE 2: It is optional to support more than one identity.	
NOTE 3: Conditional on the definition result.	

4.2.4   DEFINE request

The DEFINE request primitive shall be sent to the MS CMCE by the user application by over TNSS-SAP to give a mnemonic name to a user.

The definition process shall support one TETRA identity in a request. Optionally it may support a list and/or range of identities. Such identity/identities may only be those of individual users (since the groups have no mnemonic names).

The DEFINE request primitive shall contain the SS-TPI parameters listed in table 4.

Table 4: Parameters for the primitive DEFINE request

Parameter	Request
Access priority	O
TETRA identity/identities	M (see note 1)
TETRA mnemonic name/names	M (see note 2)
Activation request	C (see note 3)
NOTE 1: It is optional to support more than one identity.	
NOTE 2: There shall be as many mnemonic names as there are identities.	
NOTE 3: There shall be only one activation request per request primitive.	

4.2.5   INFORM indication

The INFORM indication primitive shall be sent to the user application by the MS CMCE over TNSS-SAP as a result of SS-TPI operation. The INFORM indication primitive shall contain the SS-TPI parameters listed in table 5.

Table 5: Parameters for the primitive INFORM indication

Parameter	Indication
SS-CLIR invoked for talking/sending party	M
Talking/sending party identity	C (see note 1)
Talking/sending party mnemonic name	O (see note 2)
Tx demand priority	O
NOTE 1: Conditional on SS-CLIR not having been invoked for talking/sending party.	
NOTE 2: Shall not be present if SS-CLIR has been invoked for talking/sending party.	

4.2.6   INTERROGATE indication

The INTERROGATE indication primitive shall be sent to the user application by the MS CMCE over TNSS-SAP to inform it of the result of a previous INTERROGATE request.

If the previous request has been addressed to a SwMI for more than one identity, that SwMI may send its corresponding response either in one single request which applies to all those identities or in multiple requests.

The INTERROGATE indication primitive shall contain the SS-TPI parameters listed in table 6.

Table 6: Parameters for the primitive INTERROGATE indication

Parameter	Indication
Interrogation result	M (see note 1)
TETRA identity/identities	M (see note 2)
TETRA mnemonic name/names	C (see notes 3 and 4)
Activation state	C (see notes 1 and 3)
NOTE 1: There shall be only one interrogation result and one activation state per indication primitive.	
NOTE 2: It is optional to support more than one identity.	
NOTE 3: Conditional on the interrogation result.	
NOTE 4: If that parameter is present (see note 3), there shall be as many mnemonic names as there are identities.	

4.2.7   INTERROGATE request

The INTERROGATE request primitive shall be sent to the MS CMCE by the user application by over TNSS-SAP to know the SS-TPI activation status of a user and his mnemonic name.

The interrogation process shall support one TETRA identity in a request. Optionally it may support a list and/or range of identities. Such identity/identities may be those of either individual users or of groups.

The INTERROGATE request primitive shall contain the SS-TPI parameters listed in table 7.

Table 7: Parameters for the primitive INTERROGATE request

Parameter	Request
Access priority	O
TETRA identity/identities	M (see note)
NOTE: It is optional to support more than one identity.	

4.2.8   INTERROGATE BY NAME indication

The INTERROGATE BY NAME indication primitive shall be sent to the user application by the MS CMCE over TNSS-SAP to inform it of the result of a previous INTERROGATE BY NAME request.

If the previous request has been addressed to a SwMI for more than one identity, that SwMI may send its corresponding response either in one single request which applies to all those identities or in multiple requests.

The INTERROGATE BY NAME indication primitive shall contain the SS-TPI parameters listed in table 8.

Table 8: Parameters for the primitive INTERROGATE BY NAME indication

Parameter	Indication
Interrogation result	M (see note 1)
TETRA mnemonic name/names	M (see note 2)
TETRA identity/identities	C (see notes 3 and 4)
Activation state	C (see notes 1 and 3)
NOTE 1: There shall be only one interrogation result and one activation state per indication primitive.	
NOTE 2: It is optional to support more than one mnemonic name.	
NOTE 3: Conditional on the interrogation result.	
NOTE 4: If that parameter is present (see note 3), there shall be as many identities as there are mnemonic names.	

4.2.9   INTERROGATE BY NAME request

The INTERROGATE BY NAME request primitive shall be sent to the MS CMCE by the user application by over TNSS-SAP to know the identity corresponding to a mnemonic name.

The interrogation process shall support one TETRA identity in a request. Optionally it may support a list and/or range of identities. Such identity/identities may only be those of individual users (since the groups have no mnemonic names).

The INTERROGATE BY NAME request primitive shall contain the SS-TPI parameters listed in table 9.

Table 9: Parameters for the primitive INTERROGATE BY NAME request

Parameter	Request
Access priority	O
TETRA mnemonic name/names	M (see note)
NOTE: It is optional to support more than one mnemonic name.	

4.3   Parameter description

Access priority:

- low priority;

- high priority;

- emergency priority.

The default value for that parameter shall be low priority. The value emergency priority should not be used for that parameter in any primitive.

Activation request:

That parameter shall contain the following information:

- Speech call activation:

  - deactivate;

  - activate;

- no change.

- Speech call: talking party mnemonic name:

  - no name;

  - use mnemonic name.

- Priority levels of the talking party speech requests:

  - no priority levels sent;

  - priority level sent.

- Data call activation:

  - deactivate;

  - activate;

  - no change.

- Data call: sending party mnemonic name:

  - no mnemonic name sent;

  - mnemonic name sent.

- Priority levels of the sending party data transmission requests:

  - no priority level sent;

  - priority level sent.

Activation result:

- activation/deactivation unsuccessful;

- activation/deactivation successful.

If the activation request has been unsuccessful, one of the following failure reasons shall be indicated:

- rejected for any reason;

- user not authorized;

- unknown TETRA identity;

- range not supported;

- supplementary service not subscribed for the user addressed.

Activation state:

That parameter shall contain the following information:

- Speech call subscription:

  - not subscribed;

  - subscribed.

- Speech call activation:

  - deactivated;

  - activated.

- Speech call: talking party mnemonic name:

    - no mnemonic name sent;

    - mnemonic name sent.

- Priority levels of the talking party speech requests:

    - no priority level sent;

    - priority levels sent.

- Data call subscription:

    - not subscribed;

    - subscribed.

- Data call activation:

    - deactivated;

    - activated.

- Data call: sending party mnemonic name:

    - no mnemonic name sent;

    - mnemonic name sent.

- Priority levels of the sending party data transmission requests:

    - no priority level sent;

    - priority level sent.

Definition result:

- definition unsuccessful;

- definition successful.

If the definition request has been unsuccessful, one of the following failure reasons shall be indicated:

- rejected for any reason;

- not an authorized user;

- range not supported;

- unknown TETRA identity;

- invalid PDU contents;

- text encoding scheme not supported;

- number of characters larger than 15.

Interrogation result:

- interrogation unsuccessful;

- interrogation successful.

If the interrogation request has been unsuccessful, one of the following failure reasons shall be indicated:

- rejected for any reason;

- not an authorized user;

- range not supported;

- unknown TETRA identity;

- invalid PDU contents.

If the interrogate by name request has been unsuccessful, one of the following failure reasons shall be indicated:

- rejected for any reason;

- not an authorized user;

- range not supported;

- unknown mnemonic name;

- invalid PDU contents;

- text encoding scheme not supported;

- number of characters larger than 15.

SS-CLIR invoked for talking/sending party:

- restriction on presentation of talking/sending party identity or mnemonic name not invoked;

- restriction on presentation of talking/sending party identity or mnemonic name invoked.

Talking/sending party mnemonic name and TETRA mnemonic name:

- 1 to 15 characters.

Talking/sending party identity:

- Short Subscriber Identity (SSI);

- Short Subscriber Identity (SSI) + Address extension;

- Gateway identity, possibly complemented by external party number.

TETRA identity:

- Short Number Address (SNA);

- Short Subscriber Identity (SSI);

- Short Subscriber Identity (SSI) + Address extension.

The Short Number Address (SNA) shall be valid only in requests.

TX demand priority (i.e. priority level of the talking/sending party request for transmission permission):

- low priority;

- high priority;

- pre-emptive priority;

- emergency pre-emptive priority.

5   Signalling protocol for the support of SS-TPI

5.1   SS-TPI operational requirements

5.1.1   Served user MS

The served user MS shall comply with the requirements in clause 14 of EN 300 392-2 [1] which apply to the tele and bearer services which it supports. In addition, it shall comply with the relevant call related requirements in clauses 7 and 11 of EN 300 392-9 [6].

5.1.2   Group controlling SwMI

If the served user MS is registered in the group controlling SwMI, that SwMI shall support this MS complying with the requirements for participating in a group call in the receive mode only set in clause 14 of EN 300 392-2 [1]. This SwMI shall also comply with the relevant call related requirements in clauses 7 to 11 of EN 300 392-9 [6].

If the talking/sending user MS is registered in the group controlling SwMI, that SwMI shall support this MS complying with the requirements for participating in a group call with the possibility to talk/send data, as defined in clause 14 of EN 300 392-2 [1]. That SwMI shall also comply with the relevant call related requirements in clauses 7 to 11 of EN 300 392-9 [6].

If the served user MSs and the talking/sending user MS are not all registered in the group controlling SwMI, that SwMI shall comply with the ISI requirements necessary to support group calls, set in EN 300 392-3-3 [4]. It shall also comply with the relevant call related requirements in clauses 9 to 11 of EN 300 392-9 [6].

5.1.3   Served user SwMI

That SwMI shall support the served user MS complying with the requirements for individual calls set in clause 5.1.1.

It shall also support the served user MS complying with the requirements for group calls set in clause 5.1.1 if it is different from the group controlling SwMI.

If the call is over the ISI, the served user SwMI shall comply with the corresponding ISI requirements, set in EN 300 392-3-2 [3], for individual calls and in EN 300 392-3-3 [4], for group calls. It shall also comply with the relevant call related in clauses 9 to 11 of EN 300 392-9 [6].

5.1.4   Talking/sending user SwMI

For an individual call, that SwMI shall support the possibility for the talking/sending party MS to participate in the call and to talk/send data, as defined in EN 300 392-2 [1] for individual calls. That SwMI shall also comply with the relevant call related requirements in clauses 7 to 11 of EN 300 392-9 [6].

The same shall apply for group calls if that SwMI is different from the group controlling SwMI.

If the call is over the ISI, the talking/sending user SwMI shall comply with the corresponding ISI requirements, set in EN 300 392-3-2 [3] for individual calls and in EN 300 392-3-3 [4] for group calls. It shall also comply with the relevant call related requirements in clauses 9 to 11 of EN 300 392-9 [6].

5.1.5   Authorized user MS

The authorized user MS shall comply with the call unrelated procedures defined in clause 14 of EN 300 392-2 [1], especially in its clause 14.5.4, and in clauses 7 and 11 of EN 300 392-9 [6].

5.1.6   Authorized user SwMI

That SwMI shall support the authorized user MS complying with clause 5.1.5.

If the authorized user SwMI is different from the home SwMI of the managed user(s), it shall comply with the relevant call unrelated requirements in clauses 9 to 11 of EN 300 392-9 [6].

NOTE: The managed user will be the served user during a call in the case of activation requests. It will be the talking/sending party during a call in the case of interrogations using the name as entry. It may be either the served user or the talking/sending party during a call requests in the other case of interrogation (using identity as entry) and in the case of definition.

5.1.7   Managed user home SwMI

The managed user home SwMI shall comply with the relevant call unrelated requirements in clauses 9 to 11 of EN 300 392-9 [6].

5.2   Coding requirements

The information contained in the following description tables correspond to the following key:

- Length: length of the information element in bits;

- Type: element type (1, 2 or 3) described in clause 14.7 of EN 300 392-2 [1];

- C/O/M: conditional/optional/mandatory;

- Remark: comment or reference to note(s).

5.2.1   SS-TPI PDUs

5.2.1.1   ACTIVATE PDU

The ACTIVATE PDU may be sent by the authorized user to the served user home SwMI, i.e. home SwMI of the party/parties for which SS-TPI activation is being requested. The authorized user expects an ACTIVATE ACK as a confirmation.

ACTIVATE PDU shall contain the SS-TPI information elements described in table 10, where the inclusion of at least one address is mandatory (as part of the optional ACTIVATE PDU), but that of the list or range of addresses is optional.

Table 10: ACTIVATE PDU contents

Information element	Length	Type	C/O/M		Remark
SS-Type	6	1	M		Defined in EN 300 392-9 [6]
TPI-PDU type	5	1	M		ACTIVATE
Range type for activated party/parties	4	1	M		
Address type of activated party	2	1	M		see note 1
Activated party short number	8		C		see notes 1 and 2
Activated party SSI	24		C		see notes 1 and 2
Activated party extension	24		C		see notes 1 and 2
Activation request	8	1	M		see note 3
NOTE 1: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for activated party/parties.					
NOTE 2: Shall be selected as defined by the information element address type for activated party/parties.					
NOTE 3: The information element activation request shall be valid for all addresses.					

NOTE: In the above PDU, there is no need to indicate the activated party identity using its ITSI (i.e. by complementing its SSI with its MNI), since the ACTIVATE PDU will always be sent to the home SwMI of the activated party/parties.

5.2.1.2   ACTIVATE ACK PDU

ACTIVATE ACK PDU may be sent by the SS-TPI served user home SwMI.

ACTIVATE ACK PDU shall contain the SS-TPI information elements described in table 11.

In case an ACTIVATE PDU was sent for more than one user (i.e. it included either a list or a range of identities), clause 8.3.2 of EN 300 392-9 [6] shall apply to the corresponding ACTIVATE ACK PDU.

Table 11: ACTIVATE ACK PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI-PDU type	5	1	M	ACTIVATE ACK
Range type for activated party/parties	4	1	M	
Address type of activated party	2	1	M	see notes 1 and 2
Activated party SSI	24		C	see note 1
Activated party extension	24		C	see notes 1 and 2
Multiple user mask present	1	1	M	
Multiple user mask	variable		C	see note 3
Activation/deactivation result	1	1	M	
Activation state	8		C	see note 4
Activation/deactivation failure cause	3		C	see note 5
NOTE 1: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for activated party/parties.				
NOTE 2: According to clause 8.4.1 of EN 300 392-9 [6], the information element address type of activated party shall indicate that the information element activated party extension shall be present whenever the MNI of the authorized user is different from that of the activated party.				
NOTE 3: Shall be present only when the value of the information element multiple user mask present is equal to 1.				
NOTE 4: Shall be conditional on the value of the information element activation result being equal to 1.				
NOTE 5: Shall be conditional on the value of the information element activation result being equal to 0.				

5.2.1.3   DEFINE PDU

DEFINE PDU may be sent by the authorized user to the talking/sending user home SwMI.

> NOTE 1: Since mnemonic names are only defined for individual users, DEFINE PDU is never to be sent to a group home SwMI.

The authorized user expects a DEFINE ACK PDU as a confirmation.

DEFINE PDU shall contain the SS-TPI information elements described in table 12, where the inclusion of at least one address is mandatory (as part of the optional DEFINE PDU), but that of the list or range of addresses is optional.

Table 12: DEFINE PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI-PDU type	5	1	M	DEFINE
Range type for defined party/parties	4	1	M	
Address type of defined party	2	1	M	see note 1
Defined party short number	8		C	see notes 1 and 2
Defined party SSI	24		C	see notes 1 and 2
Defined party extension	24		C	see notes 1 and 2
Text encoding scheme	7		C	see note 1
Length of the mnemonic name	8		C	see note 1
Mnemonic name character string	variable		C	see notes 1 and 3
NOTE 1: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for defined party/parties.				
NOTE 2: Shall be selected as defined by the information element address type of defined party.				
NOTE 3: The presence and length in bits of the information element mnemonic name character string shall be as defined by the information element mnemonic name length indicator.				

NOTE 2: In practice, there will be no need to indicate the defined party identity using its ITSI (i.e. by complementing its SSI with its MNI) in the DEFINE PDU, since that PDU will always be sent to the home SwMI of the defined party/parties.

NOTE 3: According to the above specification of DEFINE PDU, it is possible that such PDU include the value of the information element mnemonic name length indicator be 0, corresponding to no name present (see clause 5.2.2.18), e.g. to delete a previous name for a user without defining a new one. The value of the information element text encoding scheme will then be of course irrelevant.

5.2.1.4   DEFINE ACK PDU

DEFINE ACK PDU may be sent by the home SwMI of the party/parties for which SS-TPI definition has been previously requested (by a DEFINE PDU).

DEFINE ACK PDU shall contain the SS-TPI information elements described in table 13.

In case a DEFINE PDU was sent for more than one user (i.e. it included either a list or a range of identities), clause 8.3.2 of EN 300 392-9 [6] shall apply to the corresponding DEFINE ACK PDU.

Table 13: DEFINE ACK PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	DEFINE ACK
Range type for defined party/parties	4	1	M	
Address type of defined party	2	1	M	see notes 1 and 2
Defined party SSI	24		C	see note 1
Defined party extension	24		C	see notes 1 and 2
Multiple user mask present	1	1	M	
Multiple user mask	variable		C	see note 3
Definition result	1	1	M	
Activation state	8		C	see note 4
Definition failure cause	3		C	see note 5
NOTE 1: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for defined party/parties.				
NOTE 2: According to clause 8.4.1 of EN 300 392-9 [6], the information element address type of defined party shall indicate that the information element defined party extension shall be present whenever the MNI of the authorized user is different from that of the defined party.				
NOTE 3: Shall be conditional on the value of the information element multiple user mask present being equal to 1.				
NOTE 4: Shall be conditional on the value of the information element definition result being equal to 1.				
NOTE 5: Shall be conditional on the value of the information element definition result being equal to 0.				

5.2.1.5   INFORM PDU

INFORM PDU is sent to the MS of the served user by the SwMI where that user is registered (i.e. the served user SwMI) to deliver to this user the SS-TPI information related to the talking/sending party.

Unless there is no other SS-TPI information to deliver than the talking/sending party identity, INFORM PDU will be sent in the following basic call air interface PDUs:

- the D-SETUP PDUs if the talking/sending party is the calling user (whether the call is a group call or an individual call);

- a D-TX GRANTED or a D-TX INTERRUPT PDU if the call is a group call or a half-duplex individual call.

NOTE 1: According to the specifications of the D-TX GRANTED and D-TX INTERRUPT PDUs in EN 300 392-2 [1], those PDUs allow to send the talking/sending party identity. The same applies for the D-SETUP, as specified in EN 300 392-2 [1], when the talking/sending party is the calling user.

Even if the served user SwMI has no other SS-TPI information to send than the identity of the talking/sending party, in the case in a group call in which the talking/sending party is another user than the calling user, defined automatically at set-up time, INFORM PDU:

- will be sent in the ANF-ISIGC-SETUP PDU addressed to each participating SwMI and in the ANF-ISIGC-CONNECT PDU addressed to the originating SwMI;

- will be sent in the air interface D-SETUP PDUs broadcast by the participating SwMIs;

- should be sent in the air interface D-SETUP PDU broadcast by the group controlling SwMI.

NOTE 2: According to EN 300 392-2 [1], if the call is a group call and if the talking/sending party is another user than the calling user, defined automatically at set-up time, the calling/talking-sending party information elements in the D-SETUP PDU relate to:

- the talking-sending party, when no SS-TPI INFORM PDU is sent in the D-SETUP PDU;

- the calling party, when an SS-TPI INFORM PDU is sent (in a facility information element) in the D-SETUP PDU.

NOTE 3: The same holds for the information element external subscriber number in the D-SETUP PDU.

INFORM PDU will also be sent in the following basic call air interface PDUs which do not include any information element in their definition to send the talking/sending party identity to inform the SS-TPI served users about that identity and possibly other SS-TPI information:

- D-CONNECT PDU, if the served user is the calling user and either:

    - the call is an individual call and transmission permission has been granted to the connected user; or

    - the call is a group call and transmission permission has been granted to another user than the calling user, defined automatically at set-up time.

- D-CONNECT ACKNOWLEDGE PDU, if the served user is the connected user in an individual call.

Since there is no way for any user to request transmission permission grant at set-up time, it is excluded to indicate a priority level for such request. As a result the information element TX demand priority will be missing in the INFORM PDUs sent (to the served user(s)) in the D-SETUP, D-CONNECT or D-CONNECT ACKNOWLEDGE PDUs. Note however that when transmission permission is granted to the calling user at set-up time, in some cases the information element TX demand priority could be present, its value being derived from the information element call priority included in the ISI-SETUP or U-SETUP PDUs. Similarly when transmission permission is granted to the connected user at set-up time in an individual call, in some cases the information element TX demand priority could be present, its value being derived from the information element call priority included in the ISI-CONNECT or U-CONNECT PDUs. However the definitions both of those derivations and of the SwMIs which may do them are outside of the scope of the present document.

If SS-CLIR has been invoked for the talking/sending party, INFORM PDU should be sent in the basic call PDUs mentioned above even if no other information is to be delivered in that PDU (i.e. that PDU does not include the information element TX demand priority).

NOTE 4: The latter recommendation is to inform the served user about SS-CLIR invocation, thereby explaining why no talking/sending party identity or mnemonic name is delivered.

INFORM PDU shall contain the SS-TPI information elements described in table 14.

Table 14: INFORM PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	INFORM
SS-CLIR invoked for talking/sending party	1	1	M	
Text encoding scheme	7		C	see note 1
Length of the mnemonic name	8		C	see note 1
Mnemonic name character string	variable		C	see note 2
Address type of talking/sending party	2	2	O	see note 3
Talking/sending party SSI	24		C	see note 4
Talking/sending party extension	24		C	see note 5
TX demand priority	2	2	O	
Number of external talking/sending party number digits	5	2	O	see note 6
External talking/sending party number digit	4		C	Repeatable, see note 7

NOTE 1: Shall be conditional on the value of the information element SS-CLIR invoked for talking/sending party being equal to 0.

NOTE 2: The presence and length in bits of the information element mnemonic name character string shall be as defined by the information element length of the mnemonic name.

NOTE 3: Shall be present in INFORM PDU only when both:
- the value of the information element SS-CLIR invoked for talking/sending party is equal to 0; and

- INFORM PDU is sent:

    ▪ in an individual call: in the air interface D-CONNECT PDU or D-CONNECT ACKNOWLEDGE PDU; or

    ▪ in a group call in which the talking/sending party is another user than the calling user, defined automatically at set-up time:

        • together with the ANF-ISIGC-SETUP PDU addressed to each participating SwMI or in the air interface D-SETUP PDU; or

        • together with the ANF-ISIGC-CONNECT PDU addressed to the originating SwMI or in the air interface D-CONNECT PDU.

NOTE 4: Shall be conditional on the information element address type of talking/sending party being present (since when present, according to clause 8.4.1 of EN 300 392-9 [6], its binary value will be equal to either 01_2 or 10_2).

NOTE 5: Shall be conditional on the information element address type of talking/sending party being present with a binary value equal to 10_2. According to clause 8.4.1 of EN 300 392-9 [6], when present the latter information element shall have a binary value equal to 10_2 whenever the MNI of the talking/sending party is different from that of the served user.

NOTE 6: May be present in the case of interworking with a PSTN, ISDN or PISN (see clause 5.5) or when MS-ISDN addressing is used.

NOTE 7: The presence and the number of repetitions of the information element external talking/sending party number digit shall be as defined by the information element number of external talking/sending party number digits.

5.2.1.6 INTERROGATE PDU

INTERROGATE PDU may be sent by the authorized user to the talking/sending user home SwMI. The authorized user expects an INTERROGATE ACK PDU as a confirmation.

INTERROGATE PDU contains the SS-TPI information elements described in table 15, where the inclusion of at least one address is mandatory (as part of the optional INTERROGATE PDU), but that of the list or range of addresses is optional.

Table 15: INTERROGATE PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	INTERROGATE
Range type for interrogated party/parties	4	1	M	
Address type of interrogated party	2	1	M	see note 1
Interrogated party short number	8		C	see notes 1 and 2
Interrogated party SSI	24		C	see notes 1 and 2
Interrogated party extension	24		C	see notes 1 and 2
NOTE 1: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type identifier. NOTE 2: Shall be selected as defined by the information element address type of interrogated party.				

5.2.1.7   INTERROGATE ACK PDU

INTERROGATE ACK PDU is sent by the home SwMI of the party/parties on which a SS-TPI interrogation has been previously made (by an INTERROGATE PDU).

INTERROGATE ACK PDU shall contain the SS-TPI information elements described in table 16.

In case an INTERROGATE PDU was sent for more than one user (i.e. it included either a list or a range of identities) clause 8.3.2 of EN 300 392-9 [6] shall apply to the corresponding INTERROGATE ACK PDU.

Table 16: INTERROGATE ACK PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	INTERROGATE ACK
Range type for interrogated party/parties	4	1	M	
Address type of interrogated party	2	1	M	see notes 1 and 2
Interrogated party SSI	24		C	see note 1
Interrogated party extension	24		C	see notes 1 and 2
Interrogation result	1	1	M	
Multiple user mask present	1	1	M	
Multiple user mask	variable		C	see note 3
Text encoding scheme	7		C	see notes 4 and 5
Length of the mnemonic name	8		C	see notes 4, 5 and 6
Mnemonic name character string	variable		C	see notes 4, 5 and 7
Activation state	8		C	see note 4
Interrogation failure cause	3		C	see note 8
NOTE 1: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for interrogated party/parties. NOTE 2: According to clause 8.4.1 of EN 300 392-9 [6], the information element address type of interrogated party shall indicate that the information element activated party extension shall be present whenever the MNI of the authorized user is different from that of the interrogated party. NOTE 3: Shall be conditional on the value of the information element multiple user mask present being equal to 1. NOTE 4: Shall be conditional on the value of the information element interrogation result element value being equal to 1. NOTE 5: If present, shall be repeated as defined by the information element range type for interrogated party/parties and if present by the information element multiple user mask (which means that if the latter information element is not present, note 1 shall apply). NOTE 6: If present shall have a value different from 0. NOTE 7: When that information element is present, its length in bits shall be as defined by the information element length of the mnemonic name. NOTE 8: Shall be conditional on the value of the information element interrogation result being equal to 0.				

5.2.1.8   INTERROGATE BY NAME PDU

INTERROGATE BY NAME PDU may be sent by the authorized user to the talking/sending user home SwMI. The authorized user expects an INTERROGATE BY NAME ACK PDU as a confirmation.

INTERROGATE BY NAME PDU shall contain the SS-TPI information elements described in table 17, where the inclusion of at least one address is mandatory (as part of the optional INTERROGATE BY NAME PDU), but that of the list or range of addresses is optional.

Table 17: INTERROGATE BY NAME PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	INTERROGATE BY NAME
Range type for mnemonic name/names	4	1	M	see note 1
Text encoding scheme	7		C	see note 2
Length of the mnemonic name	8		C	see note 2
Mnemonic name character string	variable		C	see notes 2 and 3
NOTE 1: The information element range type for mnemonic name/names shall not take the binary values 0000_2 or 1111_2 in this PDU.				
NOTE 2: This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for mnemonic name/names.				
NOTE 3: The length in bits of the information element mnemonic name character string shall be as defined by the information element length of the mnemonic name.				

5.2.1.9   INTERROGATE BY NAME ACK PDU

INTERROGATE BY NAME ACK PDU may be sent by the home SwMI of the party/parties on which a SS-TPI interrogation has been previously made (by an INTERROGATE BY NAME PDU).

INTERROGATE BY NAME ACK PDU shall contain the SS-TPI information elements described in table 18.

In case an INTERROGATE BY NAME PDU was sent for more than one user (i.e. it included either a list or a range of identities), clause 8.3.2 of EN 300 392-9 [6] shall apply to the corresponding INTERROGATE BY NAME ACK PDU.

Table 18: INTERROGATE BY NAME ACK PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	INTERROGATE BY NAME ACK
Range type for mnemonic name/names	4	1	M	see note 1
Text encoding scheme	7		C	see note 2
Length of the mnemonic name	8		C	see note 2
Mnemonic name character string	variable		C	see notes 2 and 3
Interrogation result	1	1	M	
Multiple user mask present	1	1	M	
Multiple user mask	variable		C	see note 4
Address type of interrogated party	2	1	M	see notes 5, 6 and 7
Interrogated party SSI	24		C	see notes 5 and 6
Interrogated party extension	24		C	see notes 5, 6 and 7
Activation state	8		C	see note 4
Interrogation by name failure cause	3		C	see note 8

NOTE 1:   The information element range type identifier shall not take the binary values 0000_2 or 1111_2 in this PDU.

NOTE 2:   This information element shall be considered as part of a set which shall be repeated as defined by the information element range type for mnemonic names.

NOTE 3:   The length in bits of the information element mnemonic name character string shall be as defined by the information element length of the mnemonic name.

NOTE 4:   Shall be conditional on the value of the information element multiple user mask present being equal to 1.

NOTE 5:   Shall be conditional on the value of the information element interrogation result element value being equal to 1.

NOTE 6:   If present, shall be repeated as defined by the information element range type for interrogated party/parties and if present by the information element multiple user mask (which means that if the latter information element is not present, note 1 shall apply).

NOTE 7:   According to clause 8.4.1 of EN 300 392-9 [6], the information element address type identifier of interrogated party shall indicate that the information element activated party extension shall be present whenever the MNI of the authorized user is different from that of the interrogated party.

NOTE 8:   Shall be present only when the value of the information element interrogation result element value is equal to 0.

5.2.1.10   NAME REQ PDU

NAME REQ PDU is sent when the optional delivery of talking/sending party mnemonic name has been subscribed to for the served user:

- in the case of an individual call, by the served user SwMI to the talking/sending user SwMI. If the served user is the calling user, NAME REQ PDU is included in the ISI-SETUP PDU. If the served user is the connected user, NAME REQ PDU is included in the ISI-CONNECT PDU. This sending will always take place;

- in the case of a group call, by the group controlling SwMI to the originating SwMI when the calling user is not a member of the groupNAME REQ PDU will then be sent in the ISI-CONNECT message, except if the originating SwMI has already sent NAME ACK PDU (in the ISI-SETUP PDU).

NAME REQ PDU will not be sent more than once per call.

NAME REQ PDU shall contain the SS-TPI information elements described in table 19.

Table 19: NAME REQ PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	NAME REQ

5.2.1.11   NAME ACK PDU

NAME ACK PDU is sent by the talking/sending user SwMI, in response to the NAME REQ PDU:

-      in the case of an individual call, to the served user SwMI. If the served user is the calling user, NAME ACK will be sent in the ISI-CONNECT PDU. If the served user is the connected user, NAME ACK PDU will be included in the ISI-CONNECT ACKNOWLEDGE PDU;

-      in the case of a group call, to the group controlling SwMI. It will be sent in the first ISI-TX DEMAND PDU sent by the calling user when that user is not a member of the group, except if it has already been sent in the ISI-SETUP PDU (see clause 5.4.2.1).

NAME ACK PDU should be sent by the originating SwMI in the ANF-ISIGC-SETUP PDU (to establish a group call) if the calling user is not a member of the group.

NAME ACK PDU shall contain the SS-TPI information elements described in table 20.

Table 20: NAME ACK PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	NAME ACK
Text encoding scheme	7	1	M	
Length of the mnemonic name	8	1	M	
Mnemonic name character string	variable		C	see note
NOTE: The presence and length in bits of the information element mnemonic name character string shall be as defined by the information element length of the mnemonic name.				

NOTE 1: There is no need to include any information element to relate the mnemonic name given in NAME ACK PDU to a user since if sent that PDU applies for only one user:

- ▪   the user registered in the other SwMI, in an individual call; or

- ▪   the calling user, in a group call.

NOTE 2: Furthermore, there is no need to include an information element informing whether SS-CLIR has been invoked for the user the mnemonic name is being sent since the receiving SwMI is informed about such invocation by the ISI PDUs (SETUP, CONNECT or TX DEMAND).

5.2.1.12   NAME REQ BIS PDU

As a SwMI option, NAME REQ BIS PDU may be sent if the transmission of a NAME ACK PDU has failed.

NAME REQ BIS PDU shall contain the SS-TPI information elements described in table 21.

Table 21: NAME REQ BIS PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	NAME REQ BIS

5.2.1.13   TX PRIORITY REQUEST PDU

TX PRIORITY REQUEST PDU is sent in the ISI-CONNECT message in an individual call (i.e. by the terminating SwMI) when the served user is the connected user and has subscribed to the optional delivery of the priority level of the talking/sending user requests for transmission permission grant.

TX PRIORITY REQUEST PDU shall contain the SS-TPI information elements described in table 22.

Table 22: TX PRIORITY REQUEST PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	TX PRIORITY REQUEST

5.2.1.14   TX DEMAND PRIORITY PDU

TX DEMAND PRIORITY PDU is sent by the talking/sending user SwMI when it has previously received the TX PRIORITY REQUEST PDU (i.e. the served user is the connected user in an individual call and has subscribed to the optional delivery of the priority level of the talking/sending user requests for transmission permission grant). It is sent every time the talking/sending user is granted transmission permission, in the ISI basic call TX GRANTED or TX INTERRUPT PDUs.

TX DEMAND PRIORITY PDU shall contain the SS-TPI information elements described in table 23.

Table 23: TX DEMAND PRIORITY PDU contents

Information element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Defined in EN 300 392-9 [6]
TPI PDU type	5	1	M	TX DEMAND PRIORITY

5.2.2   TETRA PDU information element coding

5.2.2.1   Activated/defined/interrogated party short number address

The activated/defined/interrogated party short number address shall refer to the Short Number Address (SNA) defined for that party. See EN 300 392-9 [6], clause 8.4.1.

5.2.2.2   Activated/defined/interrogated/talking/sending party short subscriber identity

The activated/defined/interrogated/talking/sending party short subscriber identity shall indicate the Short Subscriber identity (SSI) address as defined in EN 300 392-9 [6], clause 8.4.1.

5.2.2.3   Activated/defined/interrogated/talking/sending party extension

The activated/defined/interrogated/talking/sending party extension shall indicate the extended part of the TSI (i.e. the MNI) of this party, as defined in EN 300 392-9 [6], clause 8.4.1.

5.2.2.4   Activation failure cause

See EN 300 392-9 [6], clause 8.4.5.

5.2.2.5   Activation request

Activation request shall indicate which services are requested to be activated or deactivated including the subscription options: delivery of mnemonic name of the talking/sending party and/or of the priority level of its request to talk/send. It shall be encoded as defined in table 24.

Table 24: Activation request information element contents

Information element	Length	C/O/M	Value	Remark
Speech call activation	2	M	00_2	Deactivate
			01_2	Activate
			10_2	No change (see note 1)
			11_2	Reserved
Speech call: talking party mnemonic name	1	C	0	No mnemonic name sent (see note 2)
			1	Mnemonic name sent (see note 2)
Priority levels of the talking party speech requests	1	C	0	No priority levels sent (see note 2)
			1	Priority levels sent (see note 2)
Data call activation	2	M	00_2	Deactivate
			01_2	Activate
			10_2	No change (see note 1)
			11_2	Reserved
Data call: sending party mnemonic name	1	C	0	No mnemonic name sent (see note 3)
			1	Mnemonic name sent (see note 3)
Priority level of the sending party data transmission requests	1	C	0	No priority level sent (see note 3)
			1	Priority level sent (see note 3)
NOTE 1: The information elements "speech call activation" and "data call activation" shall not take the value 10_2 when the information element activation request is being sent in the profile information element defined in table 35.				
NOTE 2: The information elements "speech call: talking party mnemonic name" and "priority level of the talking party speech requests" shall be present only when the value of the information element "speech call activation" is equal to the binary value 01, corresponding to "activate".				
NOTE 3: The information elements "data call: talking party mnemonic name" and "priority level of the talking party data transmission requests" shall be present only when the value of the information element "data call activation" is equal to the binary value 01, corresponding to "activate".				

NOTE: The binary value 10 defined in table 24 for the information elements "speech call activation" and "data call activation", corresponding to "no change", allows to activate SS-TPI for either speech or data calls without the need to define the detail of the activation request for the other type of calls.

5.2.2.6   Activation result

Activation result shall indicate whether the previous request for activation or deactivation has been successful or unsuccessful as defined in table 25.

Table 25: Activation result information element contents

Information element	Length	Value	Remark
Activation result	1	0	Activation/deactivation unsuccessful
		1	Activation/deactivation successful

5.2.2.7   Activation state

Activation state shall indicate which services are activated or deactivated and whether the mnemonic name will be used. It shall be encoded as defined in table 26.

Table 26: Activation state information element contents

Information element	Length	C/O/M	Value	Remark
Speech call subscription	1	M	0	Not subscribed (see note 1)
			1	Subscribed
Speech call activation	1	C	0	Deactivated (see note 2)
			1	Activated (see note 2)
Speech call: talking party mnemonic name	1	C	0	No mnemonic name sent (see note 3)
			1	Mnemonic name sent (see note 3)
Priority levels of the talking party speech requests	1	C	0	No priority levels sent (see note 3)
			1	Priority levels sent (see note 3)
Data call subscription	1	M	0	Not subscribed (see note 1)
			1	Subscribed
Data call activation	1	M	0	Deactivated (see note 4)
			1	Activated (see note 4)
Data call: sending party mnemonic name	1	C	0	No mnemonic name sent (see note 5)
			1	Mnemonic name sent (see note 5)
Priority level of the sending party data transmission requests	1	C	0	No priority level sent (see note 5)
			1	Priority level sent (see note 5)
NOTE 1: The values of the information elements "speech call subscription" and "data call subscription" shall not be both equal to 0 in ACTIVATE ACK PDUs: in such PDUs if SS-TPI has not been subscribed either for speech call or for data calls, the activation result shall be unsuccessful (see tables 11 and 25).				
NOTE 2: The information element "speech call activation" shall be present only when the value of the information element "speech call subscription" is equal to 1.				
NOTE 3: The information elements "speech call: talking party mnemonic name" and "priority level of the talking party speech requests" shall be present only when the value of the information element "speech call activation" is equal to 1, corresponding to "activate".				
NOTE 4: The information element "data call activation" shall be present only when the value of the information element "data call subscription" is equal to 1.				
NOTE 5: The information elements "data call: sending party mnemonic name" and "priority level of the sending party data transmission requests" shall be present only when the value of the information element "data call activation" is equal to 1, corresponding to "activate".				

5.2.2.8   Address type of activated/defined/interrogated/talking/sending party

The address type identifier information element shall indicate if the type of address which follows in the PDU is a SNA, a SSI or a full ITSI, as defined in EN 300 392-9 [6], clause 8.4.1.

NOTE 1: A single information element address type has been defined in the present document for the sake of simplicity. However the definition of some PDUs, in clause 5.2.1, is such that some values of that information element will not be used in those PDUs (e.g. the value 0 in all ACK PDUs, since no information element talking/sending party short number address has been included in any of those PDUs).

NOTE 2: For the basic call PDUs the address types for the talking and sending party are defined EN 300 392-2 [1], the external subscriber number is defined as a type 3 information element, see EN 300 392-2 [1], clause 14.8.20.

5.2.2.9   Void

5.2.2.10   Definition failure cause

Definition failure cause shall be encoded as defined in table 27.

Table 27: Definition failure cause information element contents

Information element	Length	Value	Remarks
Failure reason	3	000_2	Rejected for any reason
		001_2	User not authorized
		010_2	Range not supported (see note 1)
		011_2	reserved
		100_2	Unknown TETRA identity
		101_2	Invalid PDU contents (see note 2)
		110_2	Text encoding scheme not supported
		111_2	Number of characters larger than 15
NOTE 1: See clause 8.3.2 of EN 300 392-9 [6].			
NOTE 2: The PDU contents may be found invalid e.g.:			
- when some information element values do not exist, e.g. identity not allocated, or individual identity value being a GTSI; or because			
- the structure of an air interface PDU is wrong, e.g. O-bit or M-bit absent (see clause 14.7 of EN 300 392-2 [1]).			

5.2.2.11   Definition result

Definition result shall indicate whether the previous request for definition has been successful or unsuccessful as defined in table 28.

Table 28: Definition result information element contents

Information element	Length	Value	Remark
Definition result	1	0	Definition unsuccessful
		1	Definition successful

5.2.2.12   Void

5.2.2.13   External talking/sending party number digit

See EN 300 392-2 [1], clause 14.8.20 and EN 300 392-9 [6], clause 8.4.3.

5.2.2.14   Interrogation failure cause

Interrogation failure cause shall be encoded as defined in table 29.

Table 29: Interrogation failure cause information element contents

Information element	Length	Value	Remarks
Failure reason	3	000_2	Rejected for any reason
		001_2	User not authorized
		010_2	Range not supported (see note 1)
		011_2	Reserved
		100_2	Unknown TETRA identity
		101_2	Invalid PDU contents (see note 2)
NOTE 1: See clause 8.3.2 of EN 300 392-9 [6].			
NOTE 2: The PDU contents may be found invalid e.g.:			
- when some information element values do not exist, e.g. identity not allocated, or individual identity value being a GTSI; or because			
- the structure of an air interface PDU is wrong, e.g. O-bit or M-bit absent (see clause 14.7 of EN 300 392-2 [1]).			

NOTE: Table 29 is derived from table 20 of EN 300 392-9 [6], in removing the cause supplementary service not subscribed for user addressed.

5.2.2.15   Interrogation by name failure cause

Interrogation by name failure cause shall be encoded as defined in table 30.

Table 30: Interrogation by name failure cause information element contents

Information element	Length	Value	Remarks
Failure reason	3	000_2	Rejected for any reason
		001_2	User not authorized
		010_2	Range not supported (see note 1)
		011_2	Reserved
		100_2	Unknown mnemonic name
		101_2	Invalid PDU contents (see note 2)
		110_2	Text encoding scheme not supported
		111_2	Number of characters larger than 15
NOTE 1: See clause 8.3.2 of EN 300 392-9 [6].			
NOTE 2: The PDU contents may be found invalid e.g.:			
- when some information element values do not exist, e.g. identity not allocated, or individual identity value being a GTSI; or because			
- the structure of an air interface PDU is wrong, e.g. O-bit or M-bit absent (see clause 14.7 of EN 300 392-2 [1]).			

5.2.2.16   Interrogation result

Interrogation result shall indicate whether the previous request for interrogation has been successful or unsuccessful as defined in table 31.

Table 31: Interrogation result information element contents

Information element	Length	Value	Remark
Interrogation result	1	0	Interrogation unsuccessful
		1	Interrogation successful

5.2.2.17   Length of the mnemonic name

The length of the mnemonic name information element shall define the presence and the number of bits in the associated information element mnemonic name character string. Its definition shall be as defined in EN 300 392-9 [6], clause 8.4.2. The maximum value of that information element shall be defined according to the text encoding scheme used for the mnemonic name so that the number of characters in that name shall not exceed 15.

5.2.2.18   Multiple user mask and Multiple user mask present

See clause 8.3.2 of EN 300 392-9 [6].

5.2.2.19   Mnemonic name character string

See clause 8.4.2 of EN 300 392-9 [6].

5.2.2.19a   Number of external talking/sending party number digits

See EN 300 392-9 [6], clause 8.4.3.

5.2.2.20   Range type for activated/defined/interrogated party/parties or for mnemonic name/names

The generic definition of the information element range type (followed by the indication of the use of the specific range type) in clause 8.3.1 of EN 300 392-9 [6] applies. It indicates whether the set of information elements which follow the information element range type in the PDU definition is present at all in the PDU received, if it is present only once or if it is repeated (as a list, else as a range).

5.2.2.21   SS-CLIR invoked for talking/sending party

SS-CLIR invoked for talking/sending party shall be coded as defined in table 32.

Table 32: SS-CLIR invoked for talking/sending party information element contents

Information element	Length	Value	Remark
SS-CLIR invoked for talking/sending party	1	0	SS-CLIR not invoked for talking/sending party
		1	SS-CLIR invoked for talking/sending party

5.2.2.22   Text encoding scheme

The text encoding scheme shall indicate the character set used as defined in EN 300 392-2 [1], clause 29.5.4.1, and repeated in EN 300 392-9 [6], clause 8.4.2.

5.2.2.23   TPI PDU type

TPI-PDU type indicates the type of the TPI PDU as defined in table 33.

Table 33: TPI PDU type information element contents

Information element	Length	Value	Remark
TPI PDU type	5	00000_2	See EN 300 392-9 [6]
		00001_2	See EN 300 392-9 [6]
		00010_2	See EN 300 392-9 [6]
		00011_2	See EN 300 392-9 [6]
		00100_2	See EN 300 392-9 [6]
		00101_2	ACTIVATE
		00110_2	ACTIVATE ACK
		00111_2	DEFINE
		01000_2	DEFINE ACK
		01001_2	INTERROGATE
		01010_2	INTERROGATE ACK
		01011_2	INTERROGATE BY NAME
		01100_2	INTERROGATE BY NAME ACK
		01101_2	NAME REQ
		01110_2	NAME ACK
		01111_2	TX PRIORITY REQUEST
		10000_2	TX DEMAND PRIORITY
		10001_2	INFORM
		10010_2	NAME REQ BIS
		$> 10010_2$	Reserved

5.2.2.24   TX demand priority

TX demand priority defines the priority level of the request for transmission permission sent by the talking/sending party. It is encoded as defined in EN 300 392-2 [1], clause 14.8.47, the contents of which is reproduced in table 34.

Table 34: TX demand priority information element contents

Information element	Length	Value	Remark
TX demand priority	2	00_2	Low priority level
		01_2	High priority level
		10_2	Pre-emptive priority level
		11_2	Emergency pre-emptive priority level

5.2.2.25   SS-TPI profile

SS-TPI profile is actually an ANF-ISIMM information element, sent by the home SwMI to the visited SwMI of a subscriber when this subscriber migrates, as part of the SS profile information (see EN 300 392-3-5 [5]).

SS-TPI profile shall contain information elements as defined in table 35.

Table 35: SS-TPI profile information element contents

Information element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000011_2	SS-TPI
Activation state	8	1	M		
Text encoding scheme	7	1	M		
Length of the mnemonic name	8	1	M		
Mnemonic name character string	variable		C		see note
NOTE: The presence and length in octets of the information element mnemonic name character string shall be as defined by the information element length of the mnemonic name.					

NOTE: There is no need to specify the identity of the user to whom the profile information element specified in the above table applies since the ANF-ISIMM PDU which carries that information element already includes that identity.

5.2.2.26   SS-TPI profile ACK information element

Like SS-TPI profile, SS-TPI profile ACK is an ANF-ISIMM information element, sent by the visited SwMI of a subscriber to his home SwMI as part of the SS profile ACK information (see EN 300 392-3-5 [5]). It is an acknowledgement of the corresponding SS-TPI profile.

SS-TPI profile ACK shall contain information elements as defined in table 36.

Table 36: SS-TPI profile ACK information element contents

Information element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M		SS-TPI
Activation state	8	1	M		
Support of sending mnemonic names	1	1	M	0	Sending of name not supported
				1	Sending of name supported

5.2.3   Additional coding requirements over the ISI

The following shall apply for the PSS1 facility information element carrying an APDU of the ROSE operation used by ANF-ISISS for SS-TPI PDUs:

-        both the sourceEntity and destinationEntity data elements in the Network Facility Extension of this PSS1 facility information element shall contain the value endPINX;

-        no interpretation APDU shall be included in this PSS1 facility information element.

NOTE 1:   As mandated by clause 10.3 of EN 300 392-9 [6], each SS-TPI PDU sent by the authorized user (i.e. for definition/activation/interrogation) will include the ITSI of this authorized user as indication of the source of these PDUs when they are extended over the ISI, by invoking ANF-ISISS.

NOTE 2:   Similarly as mandated by clause 10.3 of EN 300 392-9 [6], the corresponding SS-TPI ACK PDUs sent to the authorized user will include the ITSI of this user as their destination.

5.3   SS-TPI state definitions

5.3.1   States at the served user MS

There are no SS-TPI conceptual states within the served user MS in association with a particular individual call or group call.

> NOTE 1:   The SS-TPI information sent to the served user MS is simply for information, no specific SS-TPI action being defined for this MS as a result of the reception of this information.

> NOTE 2:   In the case where the served user would have some (limited) authorized user capabilities, the applicable states would be the corresponding ones of the authorized user MS (see clause 5.3.5).

5.3.2   States at the group controlling SwMI

5.3.2.1   State for SS-TPI activation, deactivation, definition or interrogation

Only one conceptual state within the SS-TPI control application in the group controlling SwMI has been identified for writing the procedures for that SwMI for SS-TPI activation, deactivation, definition or interrogation in association with a particular request: Idle. There are different state machines invocation and operation of SS-TPI.

5.3.2.2   States for SS-TPI invocation and operation

The procedures for the group controlling SwMI for invocation and operation of SS-TPI are written in terms of the conceptual states defined below existing within the SS-TPI control application in that SwMI in association with a particular group call.

The definition of the SS-TPI invocation states for the group controlling SwMI (in association with a particular group call) is derived from the following SS-TPI group controlling basic states:

> NOTE 1:   The description of SS-TPI operation procedures uses also the conceptual states Idle, Active TX and Active RX of the basic call.

> NOTE 2:   If the talking/sending user MS is registered in the group controlling SwMI, the state machine defined for the talking/sending user SwMI will apply to the group controlling SwMI, see clause 5.3.4.

5.3.2.2.1   TPI-Idle

SS-TPI is not operating.

5.3.2.2.2   TPI-Activated

SS-TPI has been invoked with no option (i.e. no delivery of talking/sending party's mnemonic name nor of his transmission request priority).

5.3.2.2.3   TPI-Option-TX-Priority

SS-TPI has been invoked with the option delivery of the priority of the request for transmission permission made by the talking/sending party (but not with the option delivery of his mnemonic name).

5.3.2.2.4   TPI-Option-Name

SS-TPI has been invoked with the option delivery of the talking/sending party's mnemonic name (but not with the option delivery of priority of his request for transmission permission) and the group controlling SwMI is not expecting to receive (from the originating SwMI) the calling user's mnemonic name.

5.3.2.2.5   TPI-Options-Name-and-TX-Priority

SS-TPI has been invoked with both options and the group controlling SwMI is not expecting to receive (from the originating SwMI) the calling user's mnemonic name.

5.3.2.2.6   TPI-Option-Name-Caller-Name-Waiting

SS-TPI has been invoked with the option delivery of the talking/sending party's mnemonic name (but not with the option delivery of priority of his request for transmission permission) and the group controlling SwMI is expecting to receive (from the originating SwMI) the calling user's mnemonic name.

5.3.2.2.7   TPI-Options-Name-and-TX-Priority-Caller-Name-Waiting

SS-TPI has been invoked with both options and the group controlling SwMI is expecting to receive (from the originating SwMI) the calling user's mnemonic name.

5.3.3   Served user SwMI

The invocation and operation procedures for the served user SwMI are written in terms of the following conceptual states existing within the SS-TPI control application in that SwMI in association with a particular individual call.

> NOTE: There are no activation, deactivation, definition or interrogation procedures defined for the served user SwMI. In the case where the served user would have some (limited) authorized user capabilities, the states applicable to that SwMI would be the corresponding ones of the authorized user SwMI (see clause 5.3.6).

5.3.3.1   TPI-Idle

SS-TPI is not operating.

5.3.3.2   TPI-Activated

SS-TPI has been invoked with no option (i.e. no delivery of talking/sending party's mnemonic name nor of his transmission request priority).

5.3.3.3   TPI-Option-TX-Priority

SS-TPI has been invoked with the option delivery of the priority of the request for transmission permission made by the talking/sending party (but not with the option delivery of his mnemonic name).

5.3.3.4   TPI-Option-Name-Requested

SS-TPI has been invoked with the option delivery of the talking/sending party's mnemonic name (but not with the option delivery of priority of his request for transmission permission).

5.3.3.5   TPI-Options-Name-and-TX-Priority

SS-TPI has been invoked with both options.

5.3.4   Talking/sending user SwMI

The invocation and operation procedures for the talking/sending user SwMI are written in terms of the following conceptual states existing within the SS-TPI control application in that SwMI in association with a particular group or individual call.

> NOTE: There are no activation, deactivation, definition or interrogation procedures defined for the talking/sending user SwMI. In the case where the talking/sending user would have some (limited) authorized user capabilities, the states applicable to that SwMI would be the corresponding ones of the authorized user SwMI (see clause 5.3.6).

5.3.4.1   TPI-Idle

SS-TPI is not operating.

5.3.4.2   TPI-Name-Requested

The sending of: either

-          the calling user's mnemonic name, in the case of a group call; or

-          the mnemonic name of the user registered in that SwMI, in the case of an individual call;

           has been requested by another SwMI (i.e. the group controlling SwMI in the former case and the other end
           SwMI in the latter case).

5.3.4.3   TPI-TX-Priority-Requested

The sending of the priority of the request for transmission permission made by the talking/sending party has been
requested the terminating SwMI in an individual call.

      NOTE: That state does not apply when the talking/sending user SwMI is the terminating SwMI.

5.3.5   Authorized user MS

There are no conceptual supplementary service states within the authorized user MS.

      NOTE: The activation, definition and interrogation are not defined as confirmed services in SS-TPI procedures.

5.3.6   Authorized user SwMI

There are no conceptual supplementary service states within the SwMI where the authorized user MS is registered.

      NOTE: The activation definition and interrogation are not defined as confirmed services in SS-TPI procedures.

5.3.7   Managed user home SwMI

There are no conceptual supplementary service states within the SwMI where the authorized user MS is registered.

      NOTE: The activation definition and interrogation are not defined as confirmed services in SS-TPI procedures.

5.4   SS-TPI signalling procedures

Examples of message sequences are shown in annex A.

5.4.1   Actions at the served user MS

5.4.1.1   Normal procedures

The SDL representation of procedures at the served user MS is shown in clause B.1.

If SS-TPI has been invoked for a call, the served user(s) MS shall receive the SS-TPI information every time its(their)
basic call state changes to Active RX.

      NOTE 1:   According to clause 14 of EN 300 392-2 [1] that happens when that MS receives a D-TX GRANTED or
                a D-TX INTERRUPT PDU granting transmission permission to another/the other party.

The SS-TPI information shall then be included in the corresponding D-TX GRANTED or a D-TX INTERRUPT PDU as follows:

- the talking/sending party identity, as defined in table 74 of EN 300 392-2 [1], on the contents of the D-TX GRANTED and D-TX INTERRUPT PDUs;

- if SS-TPI is to be provided with the corresponding subscription parameters, the mnemonic name of the talking/sending party, if available, and his TX demand priority, in the INFORM PDU defined in table 14.

If SS-TPI has been invoked for a call, the served user(s) MS shall also receive the SS-TPI information at the time of call establishment when transmission permission is granted to another/the other party without the served user MS receiving a D-TX GRANTED PDU.

NOTE 2: At the beginning of a call, whether a group call or an individual call, no D-TX INTERRUPT message is going to be sent, since by definition no one is to be interrupted (i.e. no one is taking yet).

The following shall then apply:

- if the call is a group call and if the talking/sending party is the calling user, the served user MSs shall receive the SS-TPI information in the D-SETUP PDU as follows:

  - the talking/sending party identity, as being that of the calling party, defined in table 71 of EN 300 392-2 [1], on the contents of the D-SETUP message;

  - if SS-TPI is to be provided with the corresponding subscription parameter, the talking/sending party mnemonic name, if available, in the INFORM PDU defined in table 14.

- if the call is a group call and if the talking/sending party is another user than the calling user, to whom transmission permission has been granted automatically:

  - the MSs of the other served users than the calling user should receive the SS-TPI information in the INFORM PDU defined in table 14 sent in the D-SETUP PDU. If that is the case, that INFORM PDU shall then contain the talking/sending party identity and, if SS-TPI is to be provided with the corresponding subscription parameter, the talking/sending party mnemonic name, if available. If no SS-TPI INFORM PDU is received in the D-SETUP PDU, the served user MSs shall take the party information elements defined in table 71 of EN 300 392-2 [1], on the contents of the D-SETUP PDU, as referring to the talking/sending party;

  - the calling user MS shall receive the SS-TPI information in the INFORM PDU defined in table 14 sent in the D-CONNECT PDU.

NOTE 3: According to clause 14.5.2.2.1 of EN 300 392-2 [1], in all other cases where transmission permission is granted at the beginning of a group call the served users will then necessary receive a D-TX GRANTED PDU. Notably this will apply even to the MS of the calling user of a group call, i.e. except in the case addressed above, that MS will thereby receive a D-TX GRANTED PDU in addition to the D-CONNECT PDU. Actually, that D-CONNECT PDU is likely to be sent before the talking/sending party has been determined. Thus there is no point in defining a special procedure whereby SS-TPI information would be sent in the D-CONNECT PDU in another case than that addressed above (where transmission permission is granted automatically to another user than the calling user at the group call set-up time).

- if the call is a half-duplex individual call and if the served user is the calling user, his MS shall receive the SS-TPI information in the D-CONNECT PDU in the INFORM PDU defined in table 14;

- if the call is a half-duplex individual call and if the served user is the connected user, his MS shall receive the SS-TPI information in the D-CONNECT ACKNOWLEDGE PDU in the INFORM PDU defined in table 14.

The latter two indented paragraphs shall also apply at the time of establishment for both the calling user and the connected user of a (full) duplex individual call, of course under the proviso that SS-TPI has been activated for each of these users.

The INFORM PDUs in all air interface PDUs mentioned above shall be received through air interface facility information elements (see EN 300 392-9 [6]).

5.4.1.2   Exceptional procedures

No exceptional procedures apply at the served user MS.

5.4.2   Actions at the group controlling SwMI

5.4.2.1   Normal procedures

The SDL representation of procedures at the group controlling SwMI is shown in clause B.2.

If the group controlling SwMI is in the state TPI-Activated, it shall invoke SS-TPI for every call to this group. The SS-TPI served users shall be all listening/receiving users members of the group.

If SS-TPI has been activated with the (group) subscription option to send the talking/sending party mnemonic name, the group controlling SwMI shall be in the basic state SS-TPI-Name-Requested. It shall then receive the NAME ACK PDU defined in table 20, if this PDU is sent in the ISI-SETUP PDU (see clause 5.4.4), using ANF-ISISS. If the calling user is not a member of the group and is registered in a different SwMI (i.e. the originating SwMI is different from the group controlling SwMI), if the group controlling SwMI needs to know his mnemonic name and if that SwMI has not sent a NAME ACK PDU, the group controlling SwMI shall send to the originating SwMI the NAME REQ PDU defined in table 19, using ANF-ISISS, in the ISI-CONNECT PDU. In such a case, it shall later receive NAME ACK PDU for the calling user, defined in table 20, sent together with his first basic call ISI TX DEMAND PDU, also using ANF-ISISS.

> NOTE 1:   According to the group call establishment procedure, the calling user is the only participant in a group call which can possibly not be a member of the group - at least to the knowledge of all SwMIs involved in the group call.

> NOTE 2:   Since node actions are not to be described as part of the protocol, it should reminded that according to ETS 300 392-11-3 [8], on SS-TPI stage 2 description, the group controlling SwMI will store the mnemonic names which it has received for the talking/sending users; and if such users talk/send again, the group controlling SwMI will be able to associate their mnemonic names to their identities.

Independently of the basic state SS-TPI-Name-Requested, if SS-TPI has been activated with the (group) subscription option to send the priority level of the transmission grant request, the group controlling SwMI shall be in the basic state SS-TPI-TX-Priority. It shall then retrieve the corresponding information either:

-          in the corresponding U-TX DEMAND PDU if the user which requests transmission grant is registered in that SwMI; or

-          in the corresponding ISI-TX DEMAND PDU from the participating SwMI where the user which requests transmission grant is registered.

In the following the expressions SETUP "PDU(s)", TX GRANTED "PDU(s)" and TX INTERRUPT "PDU(s)" are used for:

-          the D-SETUP PDU(s), D-TX GRANTED PDU(s) and D-TX INTERRUPT PDU(s) respectively, broadcast to the users registered in the group controlling SwMI and participating in the group call; and

-          the ISI-SETUP PDU(s), ISI-TX GRANTED PDU(s) and ISI-TX INTERRUPT PDU(s), respectively, sent to all participating SwMIs, to be relayed to the served users registered in those SwMIs.

Similarly, the expression CONNECT "PDU" is used for either:

-          the D-CONNECT PDU sent to the calling user when he is registered in the group controlling SwMI; or

-          the ISI-CONNECT PDU sent to the originating SwMI to be relayed to the calling user.

If the group controlling SwMI is in the state TPI-Activated, every time it grants transmission permission to a user participating in the group call during that call, it shall then include the transmitting party identity in the TX GRANTED or TX INTERRUPT "PDUs" which it sends to all served users, as defined in tables 74 and 75 of EN 300 392-2 [1], on the contents of the D-TX GRANTED and D-TX INTERRUPT PDUs, respectively.

In addition, the group controlling SwMI shall supplement the transmitting party identity with the following information, sent in an INFORM PDU, defined in table 14:

- the talking/sending party mnemonic name if the group controlling SwMI is in the basic state SS-TPI-Name-Requested, unless this name is not available to it;

- the TX demand priority if the group controlling SwMI is in the basic state SS-TPI-TX-Priority.

If the group controlling SwMI grants transmission permission to the calling user at the time of call establishment, it shall then send in the SETUP "PDUs" which it sends to all served users the talking/sending party identity, as being that of the calling party, defined in table 71 of EN 300 392-2 [1], on the contents of the D-SETUP PDU.

In addition, if the group controlling SwMI is in the basic state SS-TPI-Name-Requested, it shall supplement the identity of the talking/sending party with his mnemonic name, unless this name is not available to it. That name shall be sent in an INFORM PDU, defined in table 14.

NOTE 3: Normally, that INFORM PDU sent in the D-SETUP PDUs will not include an information element TX demand priority, since the calling user cannot request transmission permission grant in the U-SETUP message, and thus even less give a priority level for such request. However this INFORM PDU could include the information element TX demand priority if the group controlling SwMI is capable to define a value for this information element from the information element call priority included in the ISI or U-SETUP PDUs. However the definition of that derivation is outside of the scope of the present document.

If the group controlling SwMI grants transmission permission to another user than the calling user automatically at the time of call establishment:

- it shall send the relevant SS-TPI information to the participating SwMIs in the INFORM PDU defined in table 14 together with the ISI-SETUP PDU;

- it should send the relevant SS-TPI information to the MSs of the other served users than the calling user registered in that SwMI, in the INFORM PDU already mentioned through the D-SETUP PDU. If this is the case, that INFORM PDU shall then contain the talking/sending party identity and, if SS-TPI is to be provided with the corresponding subscription parameter and if available, the talking/sending party mnemonic name. If the group controlling SwMI does not send that INFORM PDU, it shall put in the D-SETUP PDU as values for the party information elements defined in table 71 of EN 300 392-2 [1], on the contents of the D-SETUP PDU, those corresponding to the talking/sending party;

- it shall send the relevant SS-TPI information to the calling user MS in the INFORM PDU already mentioned together with the CONNECT "PDU".

The INFORM PDUs mentioned above shall be sent:

- in the air interface D-SETUP, D-CONNECT, D-TX GRANTED and D-TX INTERRUPT PDUs using facility information elements (see EN 300 392-9 [6]); and

- in the ISI-SETUP, ISI-CONNECT, ISI-TX GRANTED and ISI-TX INTERRUPT using ANF-ISISS.

5.4.2.2   Exceptional procedures

If in reply to the ANF-ISISS ROSE Invoke APDU used to carry the NAME REQ PDU, the group controlling SwMI receives from the originating SwMI a ROSE Return Error APDU with the error value requestNotSupported, it shall interpret it as meaning that the originating SwMI does not support the sending of mnemonic names.

NOTE 1: According to clause 5.4.2.1, the group controlling SwMI sends the NAME REQ PDU only to the originating SwMI (to know the calling user mnemonic name, in the case where the calling user is not member of the group and where the originating SwMI has not already sent the NAME ACK PDU).

NOTE 2: Since the only role of the originating SwMI is to send the calling user mnemonic name following a request from the group controlling SwMI (see clause 5.4.4.1.1), there is no difference between the two possible cases indicated by the error parameter value in the ROSE Return Error APDU mentioned above: the case where the originating SwMI does not support SS-TPI and that where it does not support the sending of NAME ACK PDU (see clause 11.1.2 of EN 300 392-9 [6] and clause 8.4.3 of EN 300 392-3-1 [2]).

If in reply to the ANF-ISISS ROSE Invoke APDU used to carry the NAME REQ PDU, the group controlling SwMI receives from the originating SwMI a ROSE Invoke APDU carrying a NAME ACK PDU with a value of its information element mnemonic name length equal to 0, it shall interpret it as meaning that the originating SwMI supports the sending of mnemonic names but does not know the mnemonic name of the calling user.

NOTE 3:   According to clause 5.4.4.1.1, that NAME ACK PDU is sent together with the first ISI TX DEMAND PDU for the calling user.

In the two preceding cases, the group controlling SwMI shall not include any name in its INFORM PDUs during the group call when the talking/sending user is not a member of the group.

NOTE 4:   This means that if SS-TPI has not been activated with the optional indication of the priority levels of the talking party speech requests, in case of a speech group call, or of sending party data transmission requests, in case of a data group call, no INFORM PDU will be sent. If SS-TPI has been activated with the preceding optional indication, the value of the information element mnemonic name length in the INFORM PDUs sent will be equal to 0.

Optionally, if the group controlling SwMI detects that the first sending of the mnemonic name of the talking/sending user by the participating SwMI where this user is registered has failed, it may request that this mnemonic name be sent again. If it supports this option, it shall send for this user NAME REQ BIS PDU, defined in table 21, using ANF-ISISS either:

-       together with the ISI-TX GRANTED PDU which follows the ISI-TX DEMAND PDU in which NAME ACK PDU had been included; or

-       in a specific PSS1 FACILITY message.

5.4.3   Actions at the served user SwMI

5.4.3.1   Normal procedures

The SDL representation of procedures at the served user SwMI is shown in clause B.3.

5.4.3.1.1   Individual call

The served user SwMI will hereafter be named SwMI A.

If it is in the state TPI-Activated, it shall invoke SS-TPI for every individual call in which the user who is going to become SS-TPI served user participates.

Depending on whether the served user is the connected user or the calling user, SwMI A shall store the calling or connected party identity received in the ISI-SETUP or CONNECT PDU, respectively.

If SS-TPI has been activated with the subscription option to send the talking/receiving party mnemonic name, SwMI A shall be in the basic state SS-TPI-Name-Requested if the call is over the ISI. It shall then include the NAME REQ PDU defined in table 19:

-       in the ISI-SETUP PDU if the served user is the calling user (i.e. SwMI A is the originating SwMI);

-       in the ISI-CONNECT PDU if the served user is the connected user (i.e. SwMI A is the terminating SwMI).

If the other SwMI knows the mnemonic name of the talking/sending party, SwMI A shall receive it in the NAME ACK PDU defined in table 20, included:

-       in the ISI-CONNECT PDU if the served user is the calling user;

-       together with the ISI-CONNECT ACKNOWLEDGE PDU if the served user is the connected user.

Both the NAME REQ PDUs and the NAME ACK PDUs mentioned above shall be sent using ANF-ISISS.

NOTE 1:   Since node actions are not to be described as part of the protocol, it should reminded that according to ETS 300 392-11-3 [8], on SS-TPI stage 2 description, SwMI A will store the mnemonic names that it has received for the other user; and whenever this user is granted permission to talk, SwMI A will remember its mnemonic name.

Independently of the basic state SS-TPI-Name-Requested, if SS-TPI has been activated with the subscription option to send the priority levels of the transmission grant requests, SwMI A shall be in the basic state SS-TPI-TX-Priority if the call is over the ISI.

If SwMI A is in that state, two cases are to be considered:

- either SwMI A is the controlling SwMI, i.e. it is the originating SwMI, which means that the served user is the calling user: then SwMI A shall retrieve the priority level of each transmission grant request in the corresponding basic call ISI TX DEMAND PDU;

- or SwMI A is the terminating SwMI, which means that the served user is the called user: then SwMI A shall send the TX PRIORITY REQUEST PDU defined in table 22, in the ISI-CONNECT PDU, using ANF-ISISS. After which SwMI A shall receive the TX DEMAND PRIORITY PDU defined in table 23, together with each ISI-TX GRANTED and ISI-TX INTERRUPT PDU sent by the originating SwMI, i.e. the SwMI where the user which requests transmission grant is registered, every time this user places such a request.

If SwMI A is in the state TPI-Activated, every time that transmission permission is granted to the other user participating in the individual call during that call, it shall then include in the D-TX GRANTED or D-TX INTERRUPT messages which it sends to the served user the talking/sending party identity, as being that of this other user which it has stored at call set-up time (calling/connected user identity).

In addition, SwMI A shall supplement the talking/sending party identity with the following information, sent in an INFORM PDU, defined in table 14:

- the talking/sending party mnemonic name if SwMI A is in the basic state SS-TPI-Name-Requested, unless this name is not available to it;

- the TX demand priority if SwMI A is in the basic state SS-TPI-TX-Priority.

Transmission permission may also be granted directly at the time of call establishment. If the call is half-duplex, the served user may then be either the calling user or the connected user, depending notably on the hook selection method chosen for the call. If the call is (full) duplex, both the calling user or the connected user shall be SS-TPI served users, of course under the proviso that SS-TPI has been activated for each of these users. SwMI A shall then deliver the SS-TPI information to the served user in the INFORM PDU defined in table 14. That INFORM PDU shall be sent:

- in the D-CONNECT ACKNOWLEDGE PDU if the served user is the connected user (i.e. transmission permission is granted to the calling user);

- in the D-CONNECT PDU if the served user is the calling user (i.e. transmission permission is granted to the connected user).

That INFORM PDU shall include the talking/sending party mnemonic name if SwMI A is in the basic state SS-TPI-Name-Requested, unless this name is not available to it.

NOTE 2: Normally, that INFORM PDU will not include an information element TX demand priority, since the calling user cannot request transmission permission grant in the U-SETUP PDU, neither the connected user in the U-CONNECT PDU, and thus even less can either of them give a priority level for such request. However that INFORM PDU could include the information element TX demand priority if either the originating or the terminating SwMI is capable to define a value for this information element from the information element call priority included in the SETUP or CONNECT PDUs. However the definitions both of this derivation and of the SwMI which may do it are outside of the scope of the present document.

In addition, if the served user is the connected user, the identity of the calling user shall be included in the D-SETUP PDU, unless SS-CLIR has been invoked for the latter.

The INFORM PDUs in all air interface PDUs mentioned above shall be sent using facility information elements (see EN 300 392-9 [6]).

5.4.3.1.2   Group call

In a group call when the group controlling SwMI grants transmission permission to the calling user automatically at call establishment, the served user SwMIs shall include the calling user identity in their D-SETUP PDUs.

NOTE 1:   Otherwise only the general procedures specified in clause 5.1.3 will apply. That means that according to clause 9.2.3 of EN 300 392-9 [6], the originating SwMI and any participating SwMI will simply relay to the served users the SS-TPI information received in the INFORM PDUs defined in table 14 from the group controlling SwMI through other ANF-ISIGC PDUs than the ANF-ISIGC SETUP PDU, i.e.:

- if the originating SwMI receives the INFORM PDU together with the ANF-ISIGC-CONNECT PDU (in the case where the talking/sending party is another user than the calling user, defined automatically at set-up time), it will send it to the calling user in the D-CONNECT PDU;

- when a participating SwMI receives the INFORM PDU together with an ANF-ISIGC-TX GRANTED PDU, it will send it to its served users in a D-TX GRANTED PDU and when it receives it together with an ANF-ISIGC-TX INTERRUPT PDU, it will send it to its served users in a D-TX INTERRUPT PDU.

NOTE 2:   In addition, if the group controlling SwMI grants transmission permission to another user than the calling user automatically at call establishment, when a participating SwMI receives the INFORM PDU together with the ANF-ISIGC-SETUP PDU, it will send it to its served users in the D-SETUP PDU.

5.4.3.2   Exceptional procedures

The following exceptional procedures apply for the served user SwMI in the case of individual call, while no exceptional procedures apply in the case of group call.

If in reply to the ANF-ISISS ROSE Invoke APDU used to carry the NAME REQ PDU, SwMI A receives a ROSE Return Error APDU with the error value requestNotSupported, it shall interpret it as meaning that the other SwMI does not support the sending of mnemonic names.

NOTE 1:   According to clause 8.4.3 of EN 300 392-3-1 [2], the error value requestNotSupported can correspond to two different cases: the case where the other SwMI does not support SS-TPI and that where it does not support the sending of NAME ACK PDU. While the accompanying the error parameter value allows to distinguish between those two cases, there is no need to do so due to the limited role of the other SwMI (see clause 5.4.4.1.2).

If in reply to the ANF-ISISS ROSE Invoke APDU used to carry the NAME REQ PDU, SwMI A receives from the other SwMI a ROSE Invoke APDU carrying a NAME ACK PDU with a value of its information element mnemonic name length equal to 0, it shall interpret it as meaning that the other SwMI supports the sending of mnemonic names but does not know the mnemonic name of the user involved in the individual call registered in it.

In the two preceding cases, SwMI A shall not include any name in its INFORM PDUs during the (individual) call.

NOTE 2:   That means that if SS-TPI has not been activated with the optional indication of the priority levels of the talking party speech requests, in case of a speech individual call, or of sending party data transmission requests, in case of a data individual call, in the cases where no mnemonic name is available to SwMI A, INFORM1 PDU will simply not be sent. In addition if SS-TPI has been activated with the preceding optional indication, the value of the information element mnemonic name length in the INFORM PDUs sent will be equal to 0.

If in reply to the ANF-ISISS ROSE Invoke APDU used to carry the TX PRIORITY REQUEST PDU, SwMI A receives a ROSE Return Error APDU with the error value requestNotSupported, it shall interpret it as meaning that the other SwMI does not support the sending of the priority levels of the talking/sending party requests for transmission permission.

NOTE 3:   Clause 8.4.3 of EN 300 392-3-1 [2] states that in general the error value requestNotSupported sent in an ANF-ISISS ROSE Return Error APDU in response to a given request SS-PDU (sent in a ANF-ISISS ROSE Invoke APDU) can correspond to two different cases: the case where the other SwMI does not support the supplementary service and that where it does not support the specific request SS-PDU. Clearly for the second case to happen, the support of the specific request SS-PDU has to be optional. Since, according to clause 5.4.4.1.2, the support of the TX PRIORITY REQUEST PDU is mandatory for the other SwMI, it should never happen for that PDU.

If SwMI A detects that it does not receive any TX DEMAND PRIORITY PDU while it has requested to receive them in sending a TX PRIORITY REQUEST PDU, as an option it may send the latter PDU again using ANF-ISISS in any PSS1 message.

If SwMI A detects that the sending of the mnemonic name of the talking/sending user by the other SwMI has failed, as an option it may request that this mnemonic name be sent again. If it supports this option, it shall send the NAME REQ BIS PDU, defined in table 21, using ANF-ISISS: either

- together with the ISI-CONNECT ACKNOWLEDGE PDU if the served user is the calling user (i.e. SwMI A is the originating SwMI); or

- in a specific PSS1 FACILITY message if the served user is the connected user (i.e. SwMI A is the terminating SwMI).

5.4.4   Actions at the talking/sending user SwMI

5.4.4.1   Normal procedures

The SDL representation of procedures at the talking/sending user SwMI is shown in clause B.4.

The served user SwMI will hereafter be named SwMI B.

There shall be no need for that SwMI to send the talking/sending user's identity since it is known:

- in an individual call, by the served user SwMI, through the ANF-ISIIC procedures;

- in a group call, by the group controlling SwMI, through the ANF-ISIGC procedures.

5.4.4.1.1   Group call

For a group call, if the calling user is not a member of the group:

- SwMI B should send the NAME ACK PDU defined in table 20 in the ISI SETUP PDU;

- if SwMI B does not support this option, SwMI B shall switch to the state TPI-Name-Requested if it receives the NAME REQ PDU defined in table 19 in the ISI-CONNECT PDU.

  NOTE: According to the group call establishment procedure, the calling user is the only participant in a group call which can possibly not be a member of the group - at least to the knowledge of all SwMIs involved in the group call.

When SwMI B is in the state TPI-Name-Requested, it shall include the mnemonic name of the calling user the first time that user requests permission to transmit. It shall do so in sending the NAME ACK PDU defined in table 20, using ANF-ISISS, together with the first ISI-TX DEMAND PDU sent for that user.

5.4.4.1.2   Individual call

For an individual call, SwMI B shall switch to the state TPI-TX-Priority-Requested if it receives the TX PRIORITY REQUEST PDU defined in table 22.

  NOTE: As mentioned in clause 5.4.3.1, it will receive that PDU only if the served user is the connected user. It will then receive it in the ISI-CONNECT message.

SwMI B shall then include the TX DEMAND PRIORITY PDU defined in table 23, together with each ISI-TX GRANTED PDU which it sends to SwMI A.

In addition, SwMI B shall receive the NAME REQ PDU defined in table 19 if sent by SwMI A:

- in the ISI-SETUP PDU if the served user is the calling user (i.e. SwMI B is the terminating SwMI);

- in the ISI-CONNECT PDU if the served user is the connected user (i.e. SwMI B is the originating SwMI).

SwMI B shall reply in sending the NAME ACK PDU defined in table 20:

- in the ISI-CONNECT PDU if the served user is the calling user;

- together with the ISI-CONNECT ACKNOWLEDGE PDU if the served user is the connected user.

Since the sending of the ISI-CONNECT PDU when the served user is the calling user has to be triggered by the U-CONNECT message from the talking/sending user, SwMI B shall switch to the state TPI-Name-Requested in-between.

Both the NAME REQ PDUs and the NAME ACK PDUs mentioned above shall be sent using ANF-ISISS.

5.4.4.2 Exceptional procedures

If SwMI B receives a ANF-ISISS ROSE Invoke APDU carrying the NAME REQ PDU and if it does not support the sending of mnemonic names, it shall send a ROSE Return Error APDU with the error value requestNotSupported and the accompanying error parameter value indicating that it does not support the NAME REQ PDU (see clause 11.1.2 of EN 300 392-9 [6] and clause 8.4.3 of EN 300 392-3-1 [2]).

NOTE: The ANF-ISISS ROSE Invoke APDU carrying the NAME REQ PDU may be sent either by the group controlling SwMI or by SwMI A.

If SwMI B does not know the talking/sending user mnemonic name, it shall reply to the corresponding NAME REQ PDU sent either by the group controlling SwMI or by SwMI A in sending the NAME ACK PDU with the value of its information element mnemonic name length equal to 0.

5.4.5 Actions at authorized user MS

The SDL representation of procedures at the authorized user MS is shown in clause B.5.

5.4.5.1 Normal procedures

The authorized user MS shall send the ACTIVATE, DEFINE, INTERROGATE or INTERROGATE BY NAME PDUs in U-FACILITY PDUs in filling in the appropriate values for the routeing information element (see table 4 of EN 300 392-9 [6]). Those values shall correspond to the managed user home SwMI.

Consequently in accordance with clause 8.4.1 of EN 300 392-9 [6], identities included in ACTIVATE, DEFINE, INTERROGATE or INTERROGATE BY NAME PDUs may be indicated using only their SSIs.

Such identities may also be specified using the managed user SNA, provided that:

- SS-SNA is supported by the managed user home SwMI; and

- SNA values have been defined against such identities for the authorized user.

The authorized user MS shall receive the ACTIVATE ACK, DEFINE ACK, INTERROGATE ACK or INTERROGATE BY NAME ACK PDUs in D-FACILITY PDUs.

In accordance with clause 8.4.1 of EN 300 392-9 [6], the authorized user MS shall complement any identities indicated using only their SSIs which have been included in any received ACTIVATE ACK, DEFINE ACK, INTERROGATE ACK or INTERROGATE BY NAME ACK PDU.

5.4.5.2 Exceptional procedures

Clause 11.2 of EN 300 392-9 [6] shall apply for the exceptional procedures at the authorized user MS. In addition, that MS shall recognize the failure causes referred to in clauses 5.2.2.4, 5.2.2.10, 5.2.2.14 and 5.2.2.15, used in ACTIVATE ACK, DEFINE ACK, INTERROGATE ACK and INTERROGATE BY NAME ACK PDUs, respectively.

NOTE: Such failure causes correspond to the case where the corresponding PDU is supported by the managed user home SwMI but cannot be given a positive response.

5.4.6   Actions at the authorized user SwMI

No specific procedures apply for the authorized user SwMI apply when that SwMI is different from the managed home SwMI, beyond those specified in clause 5.1.7.

> NOTE: The SDL representation of normal procedures corresponding to the latter clause at the authorized user SwMI is shown in clause B.6.

See clauses 5.4.7.1.1 and 5.4.7.2.1 when the authorized user SwMI coincides with the managed home SwMI.

5.4.7   Actions at the managed user home SwMI

The SDL representation of procedures at the supplementary service control entity at the managed user home SwMI is shown in clause B.7.

5.4.7.1   Normal procedures

5.4.7.1.1   Case where the managed user home SwMI coincides with the authorized user SwMI

The managed user home SwMI shall:

- receive from the authorized user MS the U-FACILITY PDU containing ACTIVATE, DEFINE, INTERROGATE or INTERROGATE BY NAME PDUs;

- once it has determined the corresponding ACTIVATE, DEFINE, INTERROGATE or INTERROGATE NAME ACK PDUs, it shall send them to the authorized user MS. If that SwMI is also the authorized user home SwMI, in accordance with clause 8.4.1 of EN 300 392-9 [6], it may then indicate identities in those PDU using only their SSIs.

5.4.7.1.2   Case where the managed user home SwMI is different from the authorized user SwMI

The supplementary service control entity at the managed user home SwMI shall:

- extract the ACTIVATE, DEFINE, INTERROGATE or INTERROGATE BY NAME PDU(s) in the received ANF-ISISS ROSE Invoke APDUs specified in clause 10 of EN 300 392-9 [6];

- process those PDUs. Notably, in accordance with clause 8.4.1 of EN 300 392-9 [6], the SwMI shall then complement any identities indicated using only their SSIs which have been included in such PDU(s). If the response to an ACTIVATE, DEFINE, INTERROGATE or INTERROGATE BY NAME PDU is positive, the SwMI shall generate the corresponding ACTIVATE ACK, DEFINE ACK, INTERROGATE ACK or INTERROGATE BY NAME ACK PDU, respectively. If the authorized user is registered in his home SwMI (i.e. the authorized user SwMI is the authorized user home SwMI, in accordance with clause 8.4.1 of EN 300 392-9 [6], the managed user home SwMI may then indicate identities in those PDU using only their SSIs;

- send such ACK PDU(s) according to clause 9.2 of EN 300 392-9 [6]. Notably the identity of the authorized user will be added to the ACTIVATE ACK, DEFINE ACK, INTERROGATE ACK or INTERROGATE BY NAME ACK PDU(s) as its(their) final destination in the corresponding ANF-ISISS PDU (see table 24 of EN 300 392-9 [6]).

5.4.7.2   Exceptional procedures

If the SwMI supports one or more of the ACTIVATE, DEFINE, INTERROGATE and INTERROGATE BY NAME PDUs but cannot give a positive response in the corresponding ACK PDU(s), it shall include in the latter PDUs the appropriate failure cause as defined in:

- clause 5.2.2.4, for the ACTIVATE ACK PDUs;

- clause 5.2.2.10, for the DEFINE ACK PDUs;

- clause 5.2.2.14 for the INTERROGATE ACK PDUs; and

- clause 5.2.2.15, for the INTERROGATE BY NAME PDUs.

In addition, the exceptional procedures referred to in clause 5.1.7 shall apply.

NOTE: The latter statement means that:

- when the managed user home SwMI coincides with the authorized user SwMI, clause 11.2.1 of EN 300 392-9 [6] will apply, taking into account the fact that the support of each of the four PDUs: ACTIVATE, DEFINE, INTERROGATE and INTERROGATE BY NAME, is optional for SS-TPI. The information defined in that clause 11.2.1 of EN 300 392-9 [6] will be sent to the authorized user MS in a D-FACILITY PDU. Such D-FACILITY PDU shall be individually addressed;

- when the managed user home SwMI is different from the authorized user SwMI, clause 11.1 of EN 300 392-9 [6] will apply, taking into account the fact that the support of each of the four PDUs: ACTIVATE, DEFINE, INTERROGATE and INTERROGATE BY NAME, is optional for SS-TPI.

5.5   SS-TPI impact of interworking with other networks

In the case of interworking with PSTN, ISDN or PISN, if the talking/sending party is another user than the external user, SS-TPI may be invoked for the corresponding gateway. Some SS-TPI information can then be delivered to the external user at call set-up time using the supplementary services available in the PSTN, ISDN or PISN, e.g. for PISN: SS-CLIP, SS-COLP, or the name identification supplementary services.

NOTE 1: For some external users, specific transportation mechanisms may be used to carry SS-TPI information through PSTN, ISDN or PISN. However, since SS-TPI has not been standardized for PSTN, ISDN or PISN such transportation mechanisms are proprietary, and thus outside the scope of standardization.

If the talking/sending party is the external user, the identity of the corresponding gateway shall be sent instead of that of the talking/sending party. In addition, if the identity of the external user is delivered to the gateway through the external network SS-CLIP or SS-COLP, the following may apply:

- if the served user(s) are the called users in a group call or the connected user in an individual call, the identity of the external user may be sent in the D-SETUP PDU using the type 3 element external subscriber number of that PDU. This holds also for the ANF-ISIGC SETUP PDU between the group controlling SwMI and each participating SwMI;

- if the served user is the calling user, the identity of the external user may be sent in the INFORM PDU sent in the D-CONNECT PDU. This holds also for the ANF-ISIGC CONNECT PDU between the group controlling SwMI and the originating SwMI;

- during the call (whether a group call or an individual call), the identity of the external user may be sent in the TX GRANTED or TX INTERRUPT PDUs using the type 3 element external subscriber number of those PDUs (whether an ISI-TX GRANTED/INTERRUPT PDU or a D-TX GRANTED/INTERRUPT PDU).

Still when the talking/sending party is the external user, if his mnemonic name may be delivered to the gateway through the external network name identification supplementary services, this name, or its first 15 characters if it is longer, may be delivered to the served user(s) in the INFORM PDUs.

If the latter option of sending the external user mnemonic name is offered, NAME REQ PDU shall be sent to the gateway SwMI:

- in the case of an individual call over the ISI, as defined in clause 5.4.3.1.1;

- in the case of a group call, as defined in clause 5.4.2.1.

NOTE 2: If more than one external user participates in the call, even through the same gateway, only one of them may not be a member of the group: the calling user. Since the NAME REQ PDU mentioned above will be addressed only for that user, there is no need to include in that PDU an identifier specific to the gateway to differentiate between such external users.

The exceptional procedures specified in clause 5.4.2.2 in the case of group call and in clause 5.4.3.2 in the case of individual call may also apply.

If SS-CLIR has been invoked for an external user in the PSTN, ISDN or PISN, clause 5.6.2 shall apply.

5.6   Protocol interactions between SS-TPI and other supplementary services and ANFs

This clause specifies the protocol interactions with other supplementary services and ANFs for which stage 3 description standards had been published at the time of publication of the present document. For interactions with supplementary services and ANFs for which stage 3 description standards are published subsequent to the publication of the present document, see those other stage 3 description standards.

NOTE 1: Additional interactions that have no impact on the signalling protocol neither at the air interface nor at the ISI can be found in the relevant stage 1 description standards.

NOTE 2: Simultaneous conveyance of APDUs for SS-TPI and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 description standard, does not, on its own, constitute a protocol interaction.

5.6.1   Interaction with Calling Line Identification Presentation (SS-CLIP)

SS-TPI and SS-CLIP shall interact when the talking/sending party at call set-up time in a group call is another user than the calling user, to whom transmission permission has been granted automatically and when no (SS-TPI) INFORM PDU is sent in the D-SETUP PDU: in that specific case SS-CLIP shall not be invoked, i.e. the calling user identity shall not be delivered to any participant in the group call.

NOTE: In the above case, the talking/sending party identity will be sent as type 2 elements in the D-SETUP PDU (see clause 5.4.1.1), while in all other cases, those type 2 elements will refer to the calling user identity.

5.6.2   Interactions with Calling/Connected Line Identification Restriction (SS-CLIR)

If SS-CLIR has been invoked for the talking/sending party, neither his identity nor his mnemonic name shall be included in any air interface PDU sent by either the group controlling SwMI or SwMI A to the served user MS. The value of the information element SS-CLIR invoked for talking/sending party in the INFORM PDU shall be set to 1.

NOTE 1: As mandated by ETS 300 392-10-3 [7], on the stage 1 description of SS-TPI, any SwMI supporting SS-TPI has to support SS-CLIR for the distant party which has invoked it.

NOTE 2: As specified in EN 300 392-3-2 [3] and EN 300 392-3-3 [4], on ANF-ISIIC and ANF-ISIGC, respectively, the invocation of SS-CLIR will be indicated in the following PDUs:

- if the SS-CLIR served user is the calling user, in the ISI SETUP PDU and in each ISI-TX DEMAND sent for this user (i.e. only during group calls);

- if the SS-CLIR served user is another user, in the ISI-CONNECT PDU for a group call when transmission permission is granted automatically to this other user at set-up time or for an individual call and in each ISI-TX DEMAND sent for this other user.

NOTE 3: The statement in the above paragraph means that when SS-CLIR has been invoked for the talking/sending party, his identity will not be included:

- in the D-SETUP PDU;

- in the D-TX GRANTED or D-TX INTERRUPT PDUs;

- or in any INFORM PDU;

unless the served user has been given the privilege to override the restriction of presentation of the talking/sending party identity. But this is outside the scope of the present document.

NOTE 4:   The statement in the above paragraph also means that the talking/sending party mnemonic name will not be included in any INFORM PDU unless the served user has been given the privilege to override the restriction of presentation of the talking/sending party mnemonic name. But this is outside the scope of the present document.

As a consequence of note 4, when SS-CLIR has been invoked for the talking/sending party, the ISI-NAME REQ PDU may or may not be sent.

There shall be no interaction between SS-TPI and SS-CLIR operations when SS-CLIR has been invoked for the SS-TPI served user.

5.6.3   Interactions with Call Authorized by Dispatcher (SS-CAD)

If SS-CAD is invoked for a call, there shall be no interaction between SS-CAD and SS-TPI if the call is not diverted to a dispatcher (i.e. no call is established between the calling user and a dispatcher, the call being only "intercepted" - see EN 300 392-12-6 [9] for the definition of "intercepted").

5.6.3.1   Individual call

After an individual call has been diverted to a dispatcher and the call authorized, according to the SS-CAD operation procedures defined in EN 300 392-12-6 [9] and EN 300 392-3-2 [3], the following protocol interactions shall apply.

At the ISI, if the originating SwMI does not coincide either with the diverting SwMI or with the terminating SwMI:

NOTE 1:   When the diverting SwMI receives an ISI-CONNECT PDU from the terminating SwMI, or directly a D-CONNECT PDU from the connected user, it will send an ISI-TROUGH CONNECT PDU to the originating SwMI. The originating SwMI will then respond in sending to the terminating SwMI the ISI-THROUGH CONNECT ACKNOWLEDGE PDU.

NOTE 2:   In addition, still according to EN 300 392-3-2 [3], the transmission permission granting will not change from the point of view of the calling user when the dispatcher call ends (i.e. if transmission permission had been granted to the dispatcher before the dispatcher call ends, the calling user will remain the listening user, while if it had been granted to the calling user, this user will remain the talking/sending party).

- If the calling user is the SS-TPI served user, the originating SwMI (SwMI A) shall:

    - retrieve in the ISI-THROUGH CONNECT PDU:

        ▪ the connected party identity;

        ▪ the information as to whether or not SS-CLIR has been invoked for the connected party;

    - and receive the NAME ACK PDU sent by the terminating SwMI together with the ISI-THROUGH CONNECT PDU in reply to the NAME REQ PDU sent by that SwMI together with its ISI-SETUP PDU.

- If the connected user is the SS-TPI served user, i.e. if SwMI B is the originating SwMI, that SwMI shall receive the NAME REQ PDU and TX PRIORITY REQUEST PDU possibly sent together with the ISI-THROUGH CONNECT PDU already mentioned, i.e. if they had been sent by SwMI A together with the ISI-CONNECT PDU. If SwMI B supports the sending of talking/sending party mnemonic names and knows the calling user's mnemonic name, it shall then answer the NAME REQ PDU just received in sending the NAME ACK PDU together with the ISI-THROUGH CONNECT ACKNOWLEDGE PDU, using ANF-ISISS.

At the air interface, if the calling user is the served user when the call is established with the connected user, the originating SwMI shall send to the calling user MS an INFORM PDU the contents of which shall be related to the connected user. It shall send that INFORM PDU in a D-INFO PDU (instead of a D-CONNECT PDU if the call had not been diverted to a dispatcher).

NOTE 3:   According to EN 300 392-12-6 [9], when the call has been diverted to a dispatcher, the connected user will be granted transmission permission at set-up time if (and only if) the dispatcher was the talking/sending party when he authorized the establishment of the call originally requested, in transferring its call with the calling user. Thus the calling user will remain the listening/receiving user when that transfer occurs, and the INFORM PDU will have been preceded by a previous one sent when transmission permission was granted for the last time to the dispatcher.

5.6.3.2   Group call

After a group call set-up has been diverted to a dispatcher and the group call authorized, according to the SS-CAD operation procedures defined in EN 300 392-12-6 [9] and EN 300 392-3-3 [4], the following protocol interactions shall apply.

At the ISI, if the originating SwMI is different from the group controlling SwMI, the former will receive the ISI-TROUGH CONNECT PDU from the latter. The originating SwMI shall receive the NAME ACK PDU possibly sent by the group controlling SwMI together with the ISI-TROUGH CONNECT PDU.

At the air interface, if the calling user is a served user when the group call is set-up (i.e. the calling user is not the talking/sending party), the originating SwMI shall send to his MS the INFORM PDU in a D-INFO PDU, else in a D-TX GRANTED or D-TX INTERRUPT PDU (instead of a D-CONNECT PDU if the call had not been diverted to a dispatcher).

5.6.4   Interactions with Connected Line identification Presentation (SS-COLP)

SS-TPI and SS-COLP can only interact when the connected user is the talking/sending party at call set-up in an individual call. Then there shall be no impact on SS-TPI operation, i.e. INFORM PDU sent in the D-CONNECT PDU shall include the identity of the talking/sending party, unless it is restricted. However no SS-COLP PDU shall be sent in the D-CONNECT PDU.

> NOTE: There cannot be any interaction between SS-TPI and SS-COLP in the case of group call, since the information delivered then by SS-COLP is the identity of the group.

5.6.5   Interactions with ISI Mobility Management (ANF-ISIMM)

When a subscriber migrates to a visited SwMI, his home SwMI shall send the following SS-TPI profile information to this visited SwMI through ANF-ISIMM:

- SS-TPI provided or not to the subscriber;

- SS-TPI activated or not; if yes, with which optional subscription parameters:

    - delivery or not of the mnemonic name;

    - delivery or not of the priority levels of the transmission grant requests;

- mnemonic name of the subscriber, if it is known;

- possible restriction of presentation of the identity and mnemonic name of the subscriber as talking/sending party (i.e. SS-CLIR has been invoked for this party).

SS-TPI provision or non provision and the possible restriction of presentation of the identity and mnemonic name of the subscriber as talking/sending party shall be sent by the home SwMI as part of ANF-ISIMM basic profile information, in the ANF-ISIMM PROFILE UPDATE PDU (see clause 33 of EN 300 392-3-5 [5]).

The visited SwMI shall acknowledge the transfer of that information, in indicating to the home SwMI, also through ANF-ISIMM, as acknowledgement of the basic profile information, whether or not it supports:

- SS-TPI as served user SwMI;

- SS-CLIR as talking/sending user SwMI, if the restriction of presentation of the identity of the subscriber as talking/sending party has been requested.

As to the SS-TPI activation possibly with optional subscription parameters and to the mnemonic name, they shall be indicated as part of the ANF-ISIMM original SS-migration profile sent by the home SwMI in the SS-TPI profile information element defined in table 35, part of the ANF-ISIMM SS-PROFILE UPDATE PDU (see clause 34 of EN 300 392-3-5 [5]). The visited SwMI shall acknowledge the SS-TPI profile information element in sending back the profile ACK information element defined in table 36, part of the ANF-ISIMM SS-PROFILE UPDATE RES PDU (see clause 34 of EN 300 392-3-5 [5]). The latter shall:

- acknowledge the SS-TPI activation requested for the subscriber. If the activation had been requested with optional subscription parameters, the response shall taking into account those supported by the visited SwMI; and

- indicate whether or not the visited SwMI supports the sending of talking/sending party mnemonic names.

5.7   SS-TPI parameter values (timers)

There shall be no timer for SS-TPI procedures.

Annex A (informative):
Examples of message sequences

This annex describes some typical message flows for SS-TPI. The following conventions are used in the figures of this annex.

The following notation is used:

$$[XXX] \longrightarrow$$
$$[YYY]$$
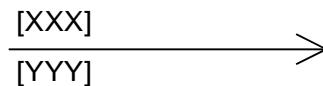
where XXX above the arrow refers to a basic call PDU, and YYY below the arrows refers to a SS-TPI PDU carried by the basic call PDU if the latter is over the air/line station interface or together with the basic call PDU if the latter is over the ISI.

If the SS-TPI PDU is independent of basic call, it is simply shown as:

$$\longrightarrow$$
$$[YYY]$$
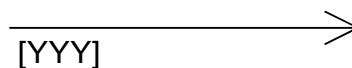
In exceptional operation (i.e. unsuccessful cases), YYY may refer to a ROSE Return Error APDU instead of a SS-TPI PDU.

The figures show messages exchanged at the air (or line station) interface via the Circuit Mode Control entities (CMCE - see clause 14 of EN 300 392-2 [1]) and over the ISI by the PSS1 Protocol Control between SwMIs involved in SS-TPI. Only messages relevant to SS-TPI are shown.

Only the relevant information content (i.e. SS PDUs and possibly ROSE Return Error APDUs) is listed below each message name. The Facility information elements containing the ROSE APDUs are not explicitly shown. Information with no impact on SS-TPI is not shown.

A.1   Example message sequence for normal operation of SS-TPI in a group call in the case where transmission is not granted automatically at set-up time

Figure A.1 shows an example of normal operation of SS-TPI in a group call in the case where transmission is not granted automatically at set-up time.

A.2   Example message sequence for normal operation of SS-TPI in a group call where transmission is granted automatically to the calling user at set-up time

Figure A.2 shows an example of normal operation of SS-TPI in a group call where transmission is granted automatically to the calling user at set-up time. In that example, the calling user is not a member of the group, and the originating SwMI sends the NAME ACK PDU with the ISI-SETUP.

A.3 Example message sequence for normal operation of SS-TPI in a group call where transmission is granted automatically to another user than the calling user at set-up time

Figure A.3 shows an example of normal operation of SS-TPI in a group call where transmission is granted automatically to another user than the calling user at set-up time. In that example, SS-TPI has been activated with the subscription option delivery of name, the calling user is not a member of the group, and the originating SwMI has not sent the NAME ACK PDU with the ISI-SETUP.

A.4 Example message sequence for exceptional operation of SS-TPI in a group call where the originating SwMI does not support the sending of name

Figure A.4 shows an example of exceptional operation of SS-TPI where the request by the group controlling SwMI to the originating SwMI to send the calling user name fails because the originating SwMI does not support such sending. Such request is placed only when SS-TPI has been activated with the subscription option delivery of name and the calling user is not a member of the group. In that example, transmission is granted automatically at set-up time to another user at set-up time.

MSC Group_call_nobody_start_talking

process Served_user_MS_LS	process Served_user_SwMI	process Group_controlling_SwMI	process Served_user_SwMI	process Served_user_M_LS
MS/LS	Originating_SwMI	Group_controlling_SwMI	Participating_SwMI	MS/LS

ISI–TX GRANTED   ISI–TX GRANTED   ISI–TX GRANTED   ISI–TX GRANTED

[INFORM]   [INFORM] [INFORM]   [INFORM]
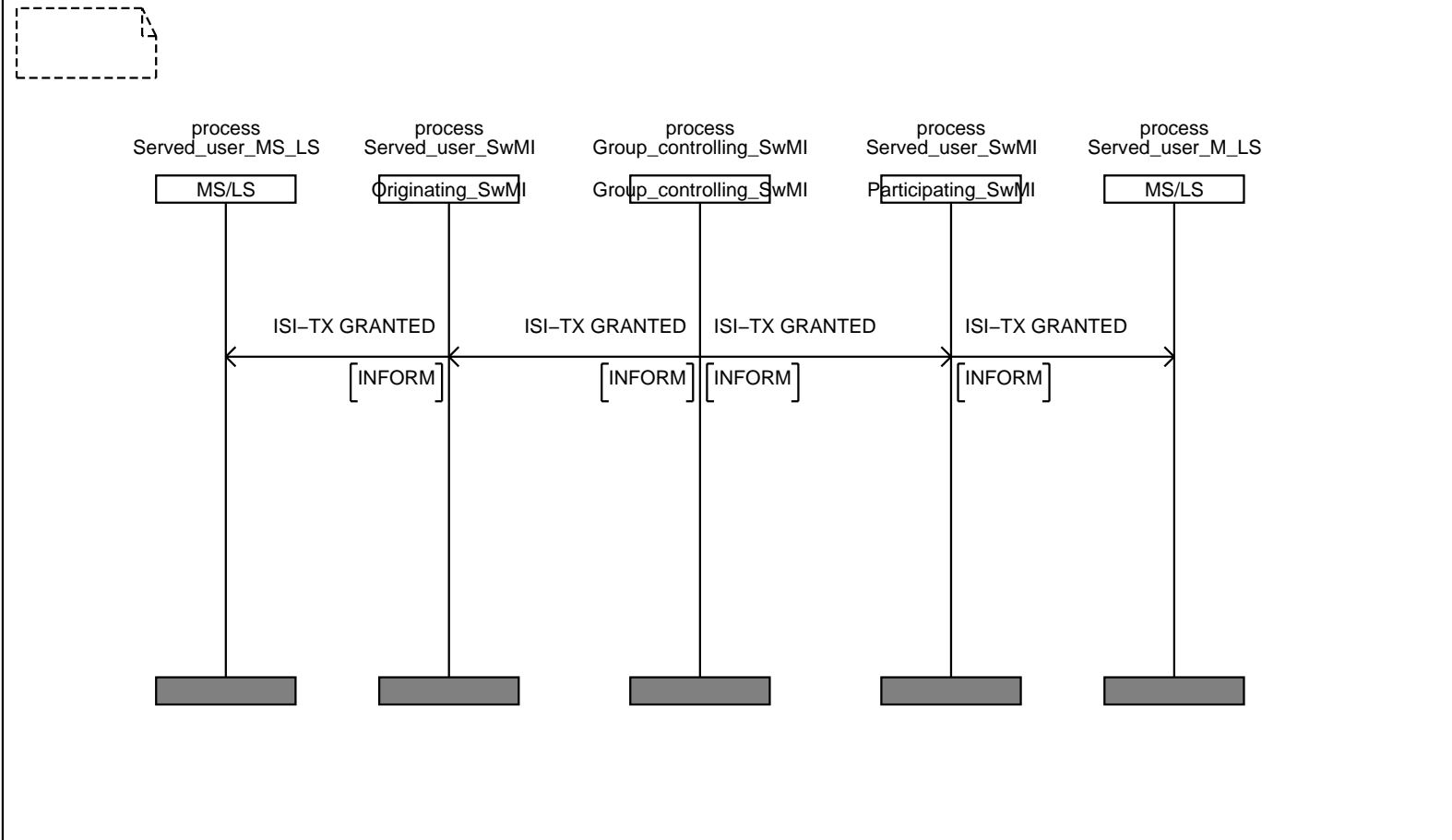
**Figure A.1: Message sequence for normal operation of SS-TPI in the case where
transmission is not granted automatically at set-up time**

MSC Group_call_caller_not_member_start_talking

process
Served_user_MS_LS

MS/LS

process
Served_user_SwMI

Originating_SwMI

process
Talking_sending_user_SwMI

Originating_SwMI

ISI–SETUP

NAME_ACK

process
Group_controlling_SwMI

Group_controlling_SwMI

ISI–SETUP

INFORM

process
Served_user_SwMI

Participating_SwMI

D–SETUP

INFORM

process
Served_user_M_LS

MS/LS

D–TX GRANTED

INFORM

ISI–TX GRANTED

INFORM

ISI–TX GRANTED

INFORM

D–TX GRANTED

INFORM

Figure A.2: Message sequence for normal operation of SS-TPI in a group call where
transmission is granted automatically to the calling user at set-up time

MSC Group_call_caller_not_member_start_listening_1

process Served_user_MS_LS	process Served_user_SwMI		process Group_controlling_SwMI	process Served_user_SwMI	process Served_user_M_LS
MS/LS	Originating_SwMI		Group_controlling_SwMI	Participating_SwMI	MS/LS

process
Talking_sending_user_SwMI

Originating_SwMI

ISI–SETUP

[note 1]   ISI–SETUP   D–SETUP

D–CONNECT   ISI–CONNECT   [INFORM]   [INFORM]

[INFORM]   [INFORM]   [NAME_REQ/INFORM] (note 2)

1st ISI–TX DEMAND

[NAME_ACK]   ISI–TX GRANTED   D–TX GRANTED
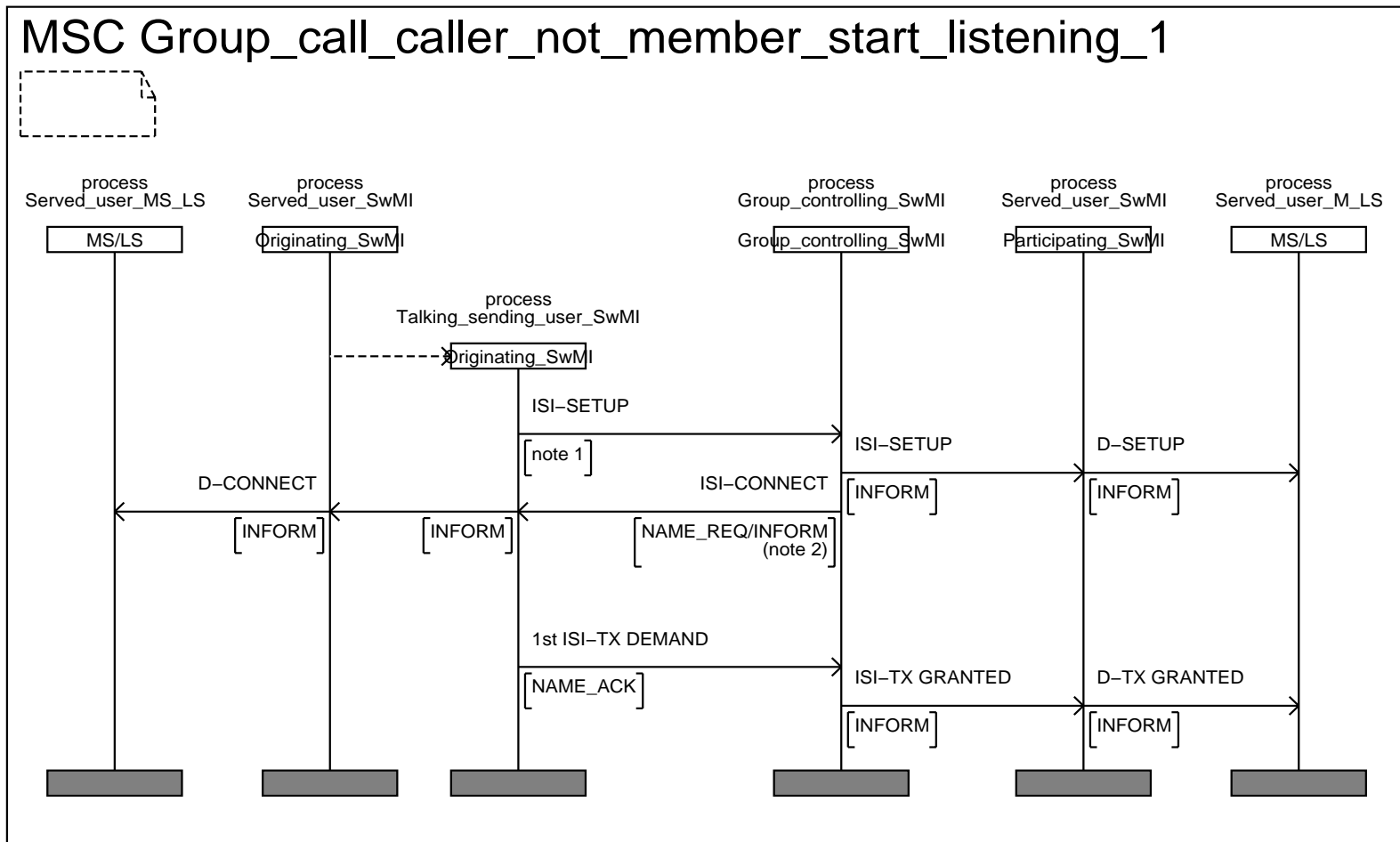
[INFORM]   [INFORM]

NOTE 1:   No NAME ACK PDU is sent together with the ISI-SETUP PDU. The latter is shown only for information.
NOTE 2:   Both the INFORM PDU and the NAME REQ PDU shall be sent together with the ISI-CONNECT PDU.

**Figure A.3: Message sequence for normal operation of SS-TPI in a group call where
transmission is granted automatically to another user than the calling user at set-up time**

MSC Group_call_caller_not_member_start_listening_2

process
Served_user_MS_LS

process
Served_user_SwMI

process
Group_controlling_SwMI

process
Served_user_SwMI

process
Served_user_M_LS

MS/LS Originating_SwMI Group_controlling_SwMI Participating_SwMI MS/LS

process
Talking_sending_user_SwMI

Originating_SwMI

ISI–SETUP

[note 1]

ISI–SETUP   D–SETUP

D–CONNECT   ISI–CONNECT

[INFORM]   [INFORM]

[INFORM]   [INFORM]   NAME_REQ/INFORM
(note 2)

[Request_not_supported]
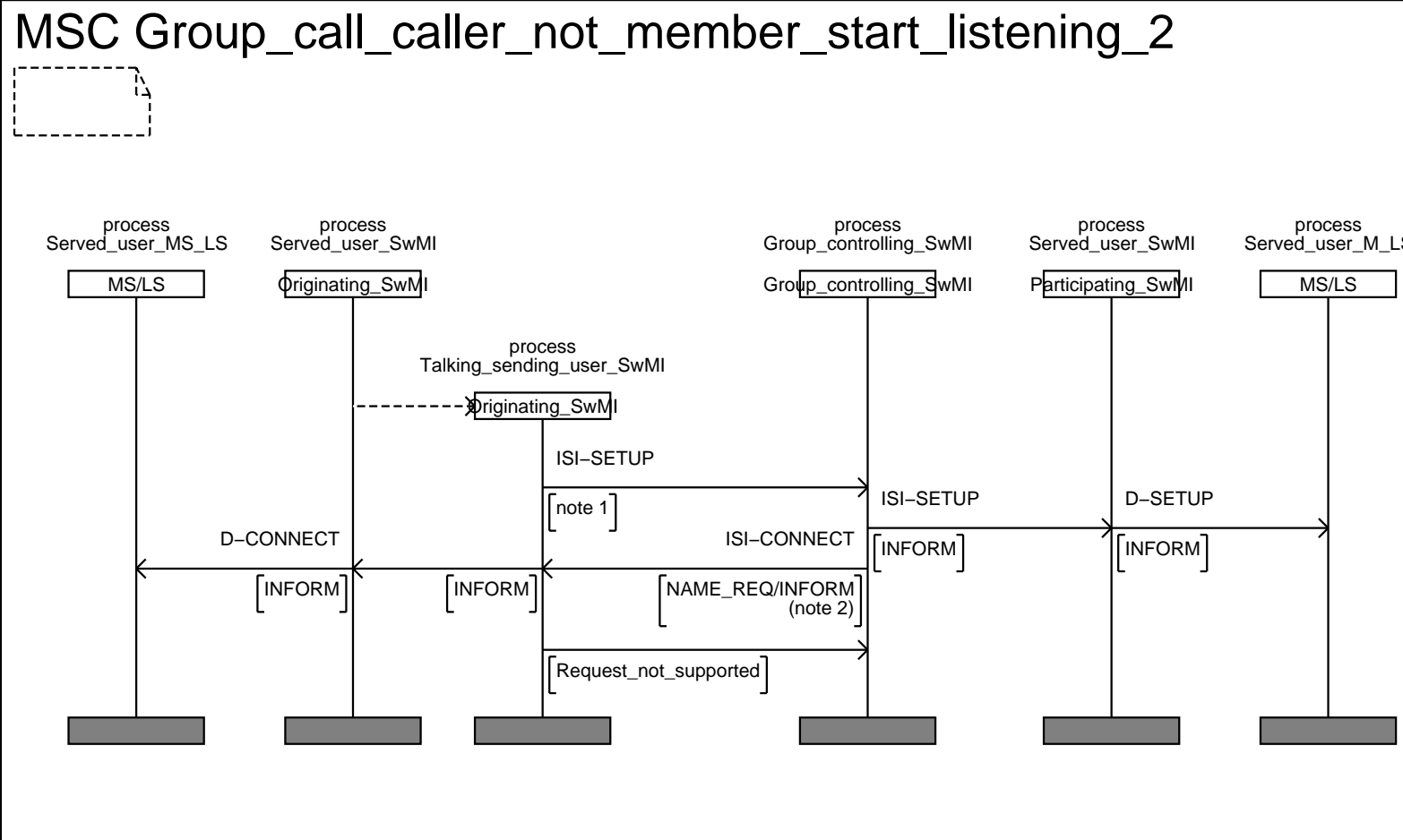
NOTE 1: No NAME ACK PDU is sent together with the ISI-SETUP PDU. The latter is shown only for information.
NOTE 2: Both the INFORM PDU and the NAME REQ PDU shall be sent together with the ISI-CONNECT PDU.

**Figure A.4: Message sequence for exceptional operation of SS-TPI in a group call where
the originating SwMI does not support the sending of name**

A.5   Example message sequence for normal operation of SS-TPI in an individual call for the calling user

Figure A.5 shows an example of normal operation of SS-TPI in individual call for the calling user where SS-TPI has been activated with the subscription option delivery of name. In that example transmission is granted automatically the connected user at set-up time.
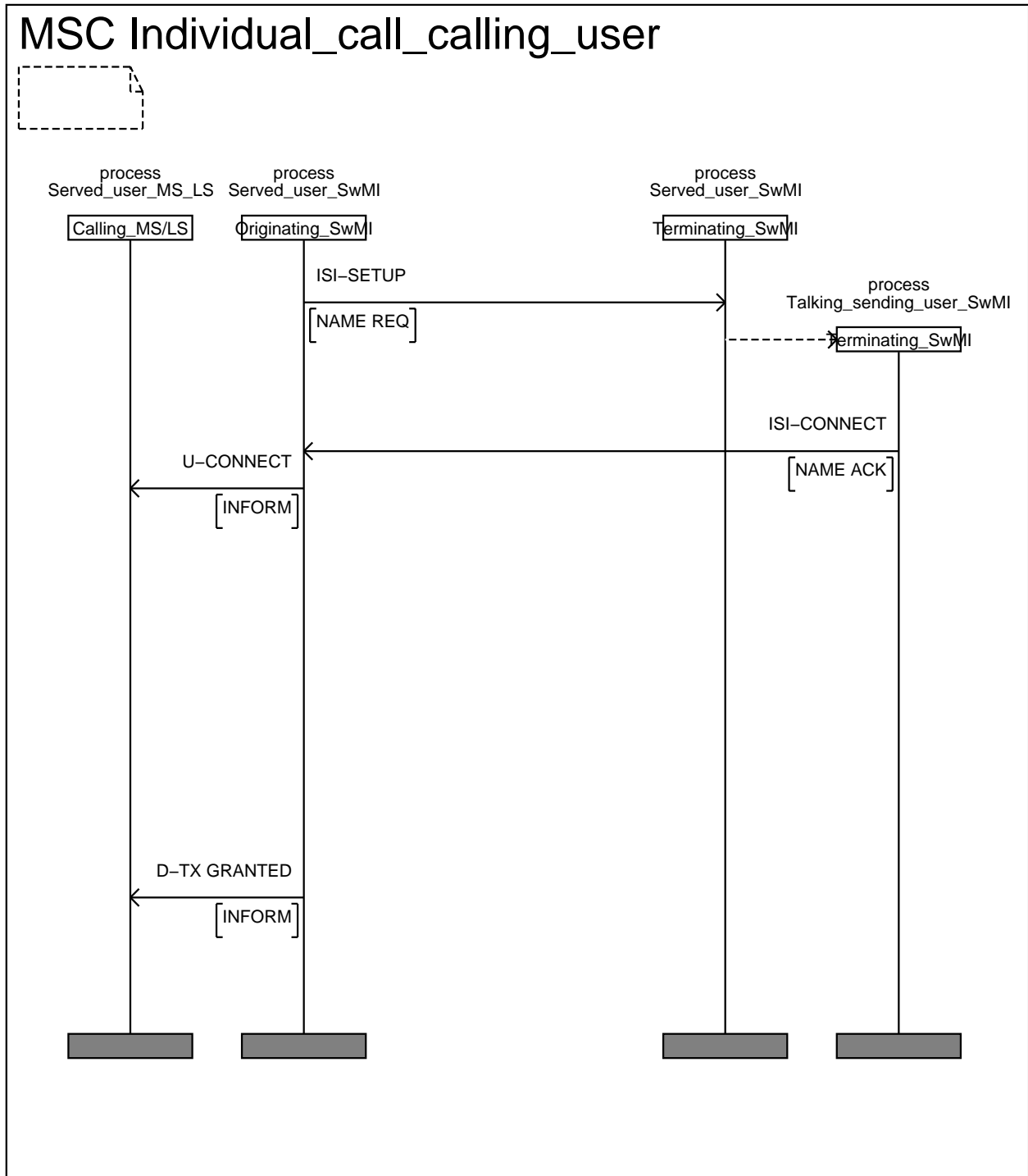
Figure A.5: Message sequence for normal operation of SS-TPI for the calling user

A.6   Example message sequence for normal operation of SS-TPI in an individual call for the connected user

Figure A.6 shows an example of normal operation of SS-TPI in individual call for the connected user where SS-TPI has been activated with both subscription options delivery of name and of priority levels of the transmission permission requested by the calling user. In that example transmission is granted automatically the calling user at set-up time.

If SS-TPI has been activated for both the calling user and the connected user, the message sequences for SS-TPI operation in an individual call for the connected user will be combined with those for the calling user. Notably when SS-TPI has been activated for both the calling user and the connected user with the subscription options delivery of name both NAME ACK (for SS-TPI operation for the calling user) and NAME REQ (for SS-TPI operation for the connected user) will be sent together with the ISI-CONNECT PDU.
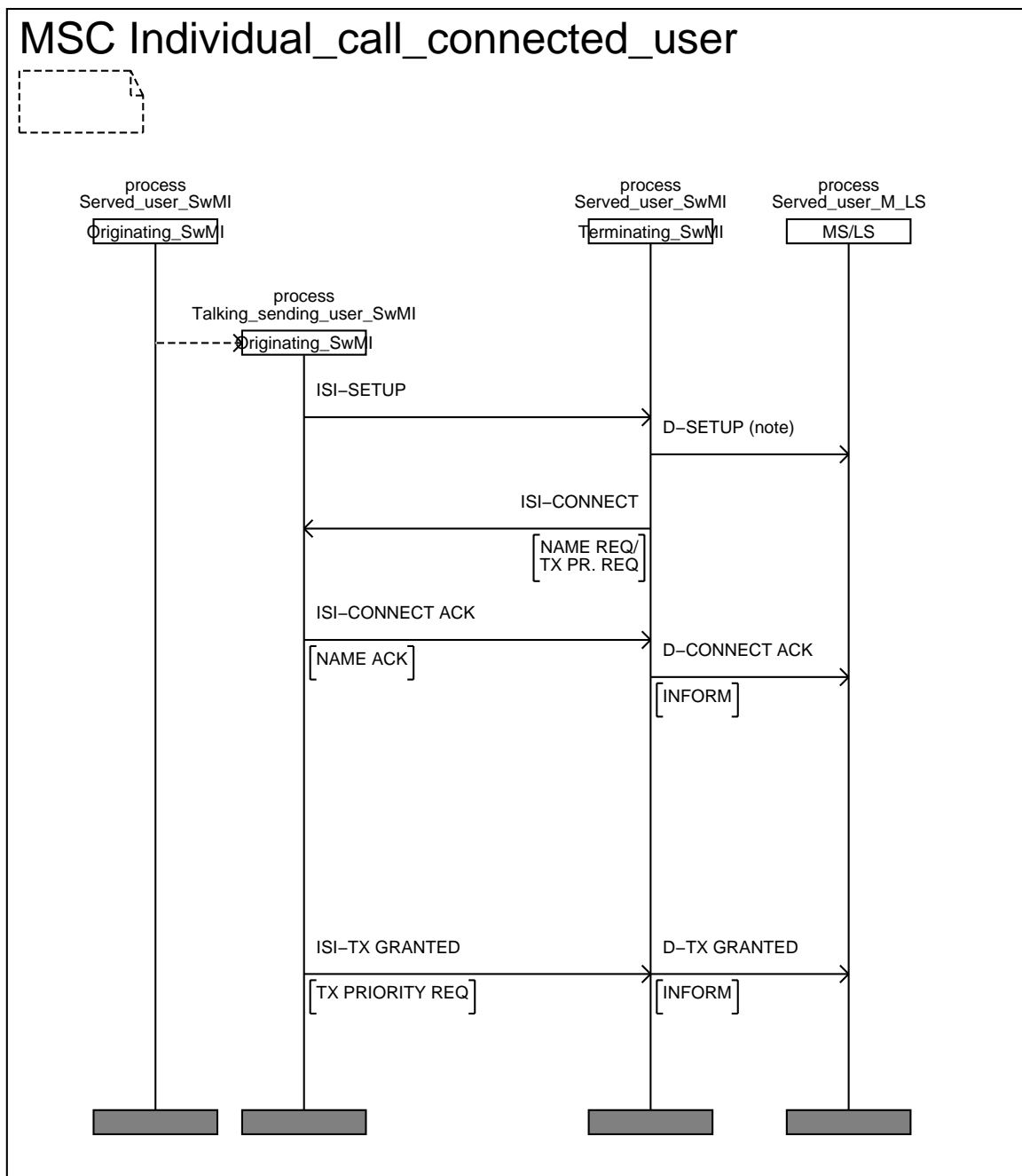
Figure A.6: Message sequence for normal operation of SS-TPI for the connected user

Annex B (informative):
Specification and Description Language (SDL) representation of procedures

The diagrams in this annex use the Specification and Description Language defined in ITU-T Recommendation Z.100 [11].

The diagrams for MSs and SwMIs represent the behaviour of SS-TPI supplementary service control entities at those MSs and SwMIs, respectively.

NOTE 1: The SS-TPI supplementary service control entities at the group controlling SwMI and at the served user SwMI, actually control more than interface, i.e.:

-    the SS-TPI supplementary service control entity at the group controlling SwMI controls the interfaces with the calling user, with the served users and with the talking/sending user. Each of those interfaces maybe either with a SwMI (over the ISI) or with a MS (at the air interface for a MS, and its equivalent for a LS);

-    the SS-TPI supplementary service control entity at the served user SwMI controls:

•   one ISI interface with either the group controlling SwMI in the case of a group call or the other end SwMI in the case of an individual call; and

•   one air interface with the MSs of served user registered in that SwMI (else the equivalent LS interfaces).

NOTE 2: The procedures shown for the authorized user MS, for the authorized user SwMI, for the managed user SwMI and for the participating SwMI as a served user SwMI (see sheet 5 of figure B.3 are generic procedures, i.e. they are not specific to the SS-TPI supplementary service control entities at those MS and SwMIs.

In accordance with the protocol model described in clause 14 of EN 300 392-2 [1], the supplementary service control entity at a MS uses the services of the air interface basic call control. The same applies for the supplementary service control entity at the SwMI where the MS subscriber is registered. And for SS-TPI ISI protocols, in accordance with the protocol model described in clause 8 of EN 300 392-3-1 [2], the supplementary service control entity (at a SwMI) uses, via the co-ordination function, the services of ANF-ISIGC and/or ANF-ISIIC for call related procedures, and of Generic Functional Transport control for call unrelated procedures.

At a MS, where an output symbol represents a primitive resulting from a SS-TPI PDU received, that symbol bears the name of that PDU. If that PDU has been received in a basic call PDU, the name of the latter PDU is also included in the name of that primitive.

The basic call actions associated with the sending and receiving of the air interface PDUs specified in EN 300 392-2 [1] are deemed to occur. The same applies for the sending of the ANF-ISIGC PDUs specified in EN 300 392-3-3 [4] and for the sending of the ANF-ISIIC PDUs specified in EN 300 392-3-2 [3].

The following abbreviations are used:

CNNCT   for CONNECT;

DMD   for DEMAND;

GRT   for GRANTED;

IRT   for INTERRUPT.

All basic call PDUs with no prefix specifying whether they are air interface PDUs or ISI PDUs are to be understood as being air interface PDUs if the users to which they are addressed are registered in the same SwMI, and as ISI PDUs, otherwise.

NOTE 3: The basic call PDUs at the air interface or at the ISI which do not carry any SS-TPI information have not been shown on the figures.

The suffix PDU has been omitted after the PDU names (e.g. INFORM or NAME REQ).

B.1   SDL representation of SS-TPI at the served user MS

Figure B.1 shows the behaviour of an SS-TPI supplementary service control entity within the served user MS.

Input signals from the right represent air interface PDUs received from the served user SwMI.

Output signals to the right represent air interface PDUs sent to the served user SwMI.

Input signals from the left represent primitives from the authorized user application.

Input signals from the left represent primitives from the served user application.

Output signals to the left represent primitives to the served user application.

Process Served_user_MS_LS   1(1)
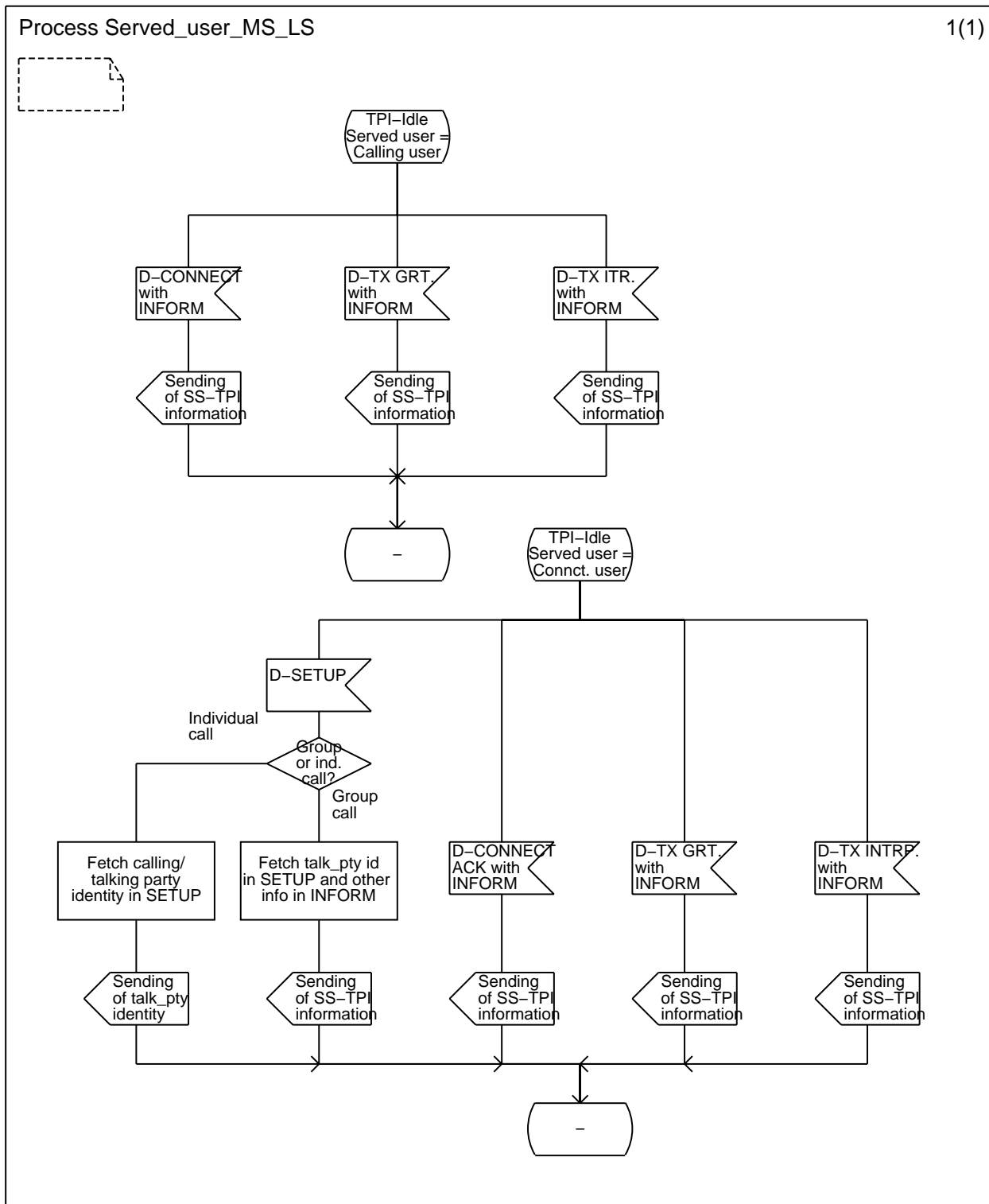
Figure B.1: Served user MS SDL

NOTE: In the case where the served user would have some (limited) authorized user capabilities, the applicable
         SDL would be the corresponding part of the SDL at the authorized user MS (see clause B.5).

B.2   SDL representation of SS-TPI at the group controlling SwMI

Figure B.2 shows the behaviour of an SS-TPI supplementary service control entity within the group controlling SwMI for the invocation and the operation of this supplementary service.

> NOTE: For the behaviour of an SS-TPI supplementary service control entity within the group controlling SwMI for activation, deactivation, definition and interrogation of this supplementary service, see clauses B.7 and B.8.

Input signals from the right represent PDUs received from the MS of the talking/sending user if that user is registered in the group controlling SwMI, or from the talking/sending user SwMI, otherwise. However there is one exception to this rule: the input signal SETUP shown on sheet 1 of figure B.2 in the case where the originating SwMI is different from the group controlling SwMI (i.e. even when the calling user is an SS-TPI served user, that is when he is listening/receiving and not talking/sending, he is not served directly by the group controlling SwMI, but only indirectly).

Output signals to the right, which are all named with the prefix ISI, represent PDUs sent to the other SwMIs (i.e. the originating SwMI for the output signal ISI-CONNECT shown on sheet 3 of figure B.2, and the participating SwMIs for the other output signals - being understood that the originating SwMI becomes a participating SwMI after the call has been established).

Input signals from the left represent PDUs received from the MS of the calling user when that user is registered in the group controlling SwMI.

Output signals to the left represent PDUs sent to the MS of the served users registered in the group controlling SwMI.

Process Group_controlling_SwMI   Call_start(6)
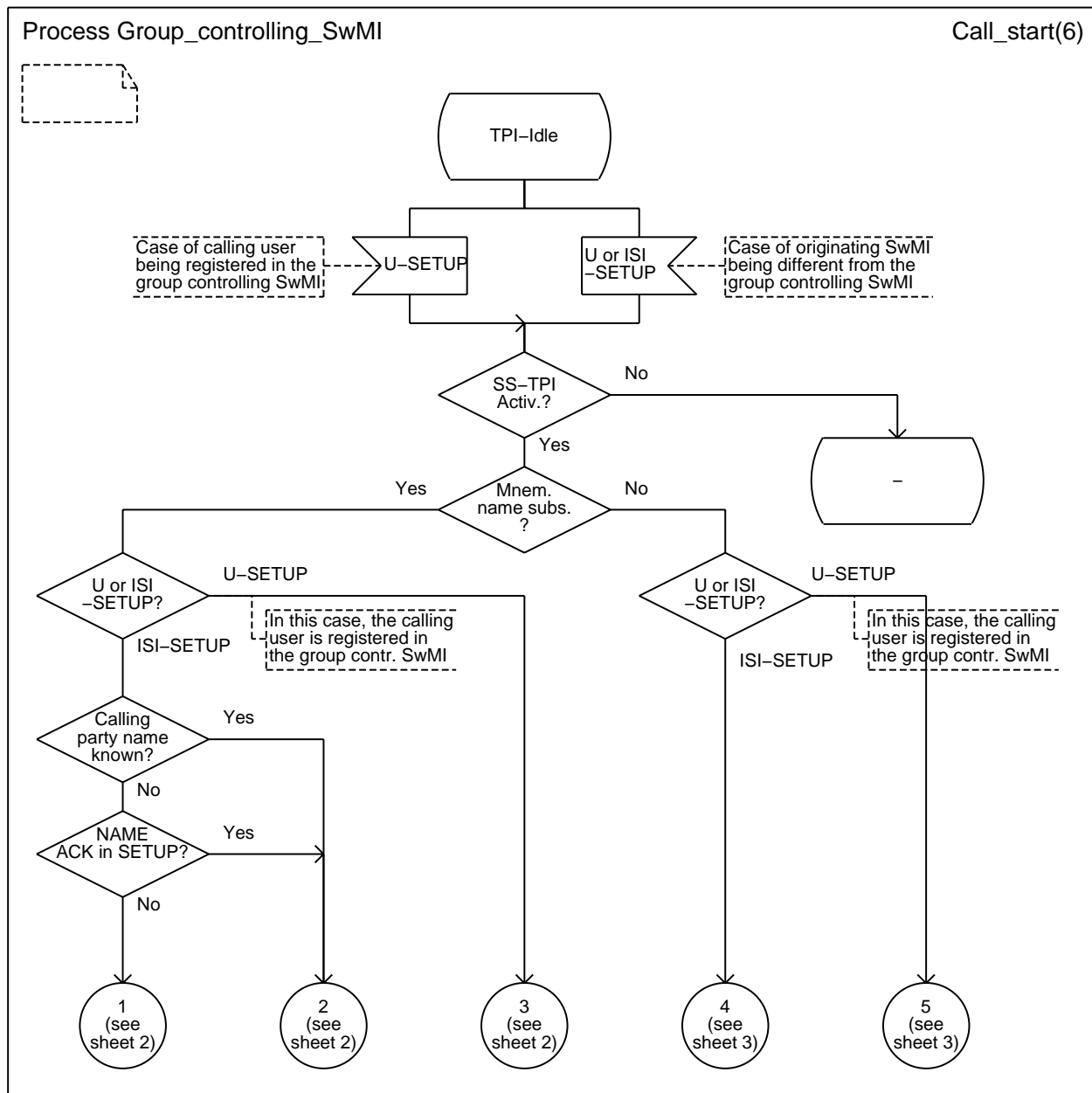
Figure B.2 (sheet 1 of 6): Group controlling SwMI SDL Call start

Process Group_controlling_SwMI   Transmission_grant_at_setup_with_name(6)
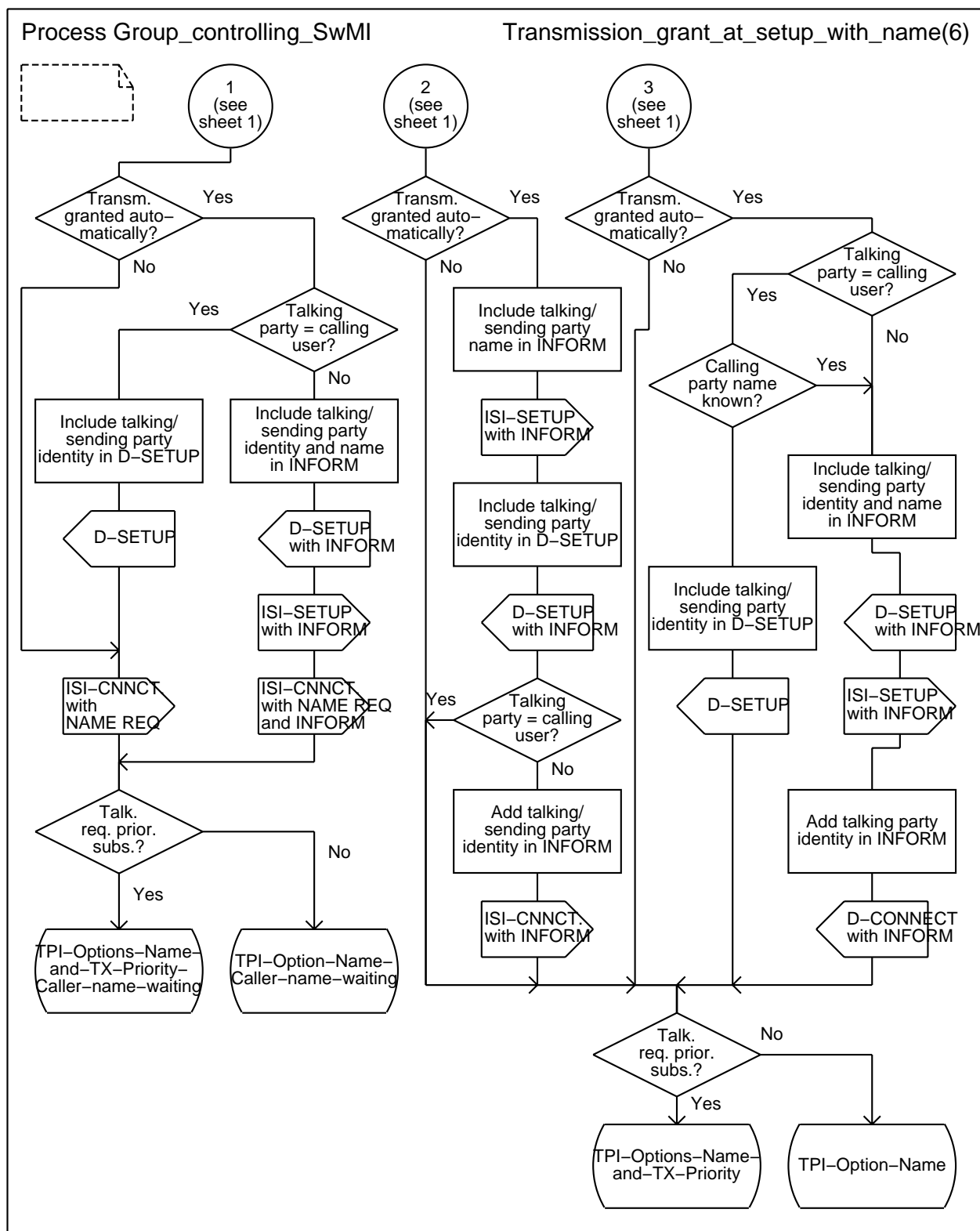
Figure B.2 (sheet 2 of 6): Group controlling SwMI SDL Transmission granted automatically at
set-up time, with SS-TPI option of mnemonic name delivery

Process Group_controlling_SwMI   Transmission_grant_at_setup_with_no_name(6)
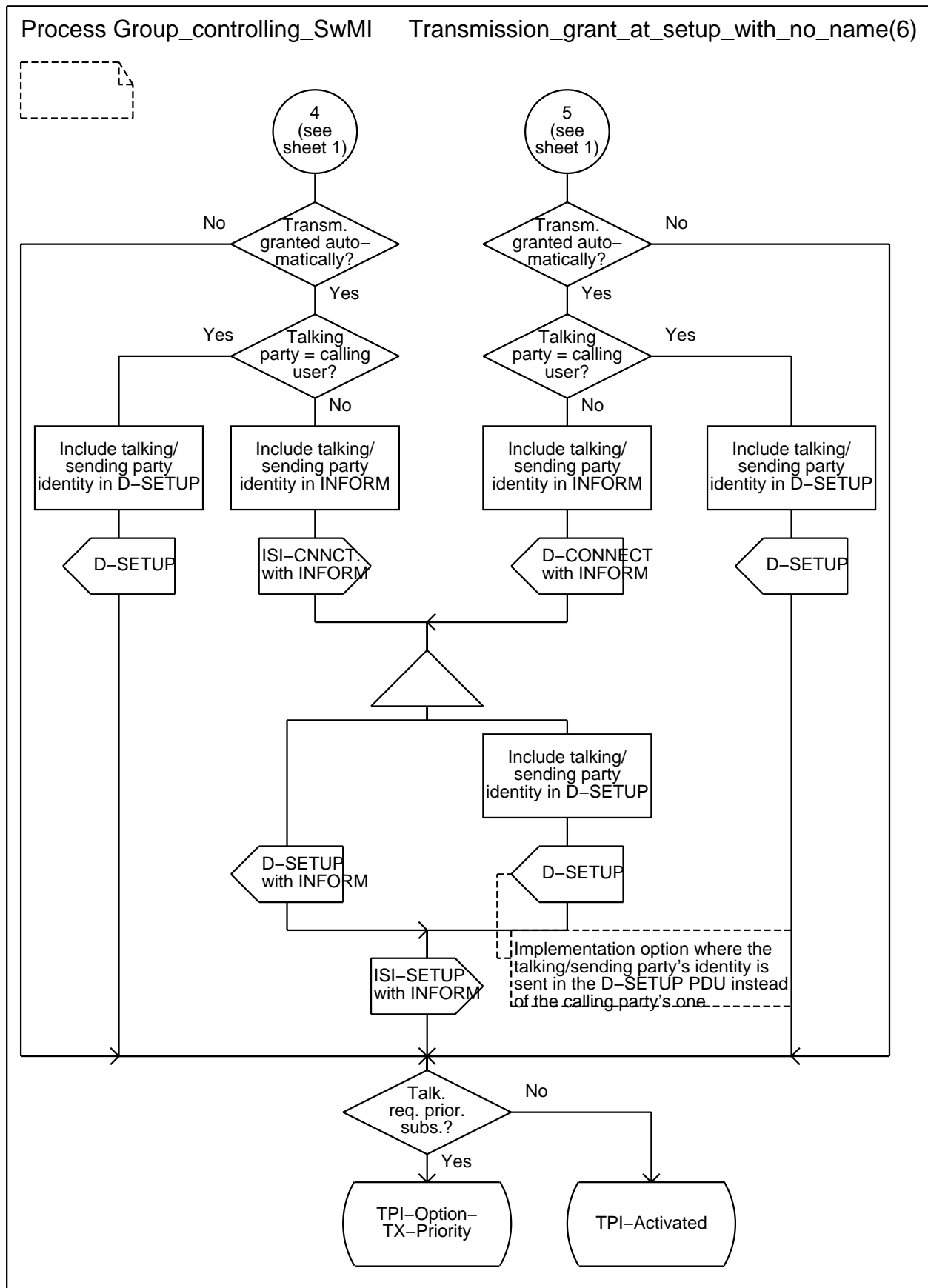
Figure B.2 (sheet 3 of 6): Group controlling SwMI SDLTransmission granted automatically at set-up time, with no mnemonic name delivery
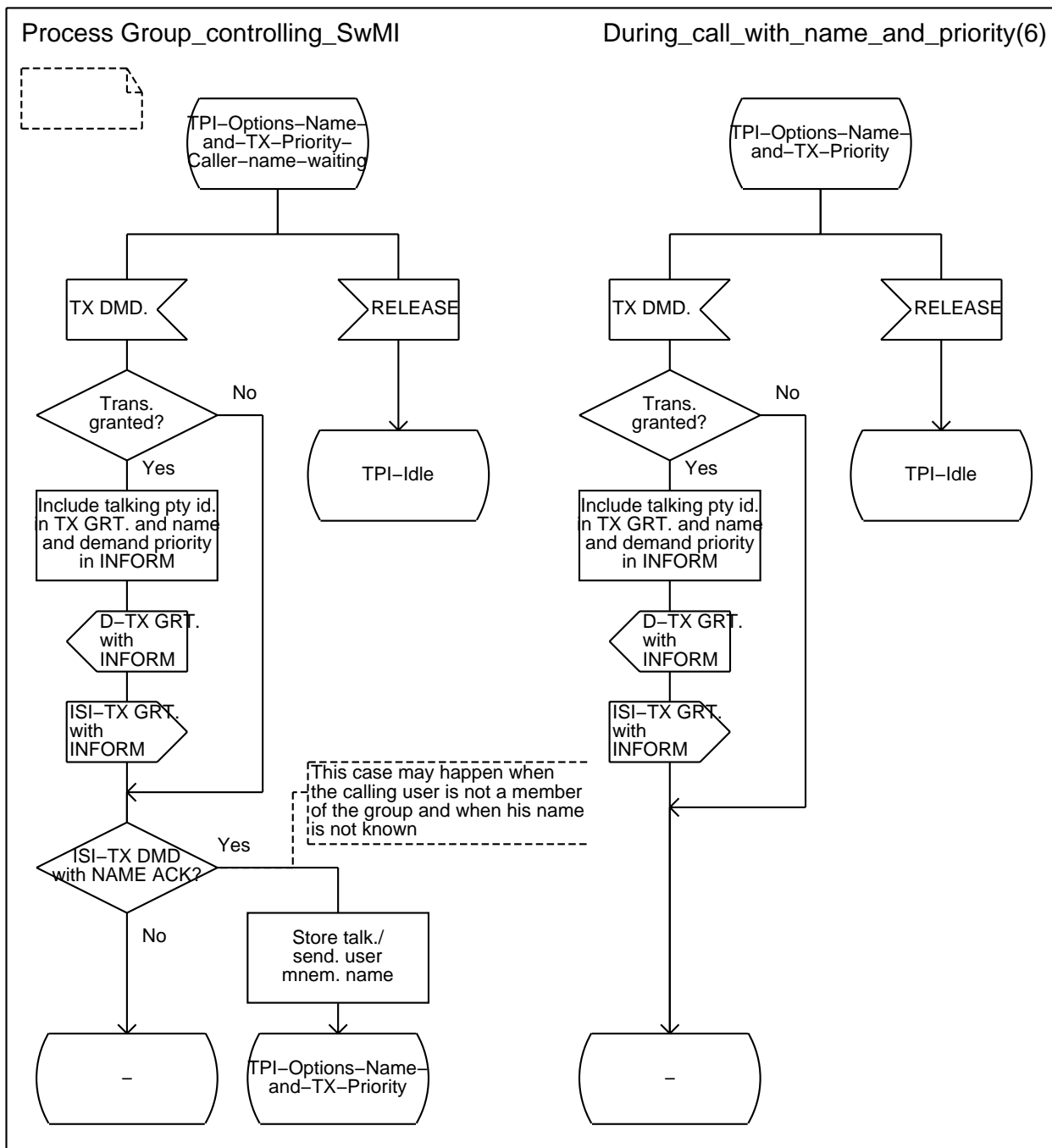
NOTE 1:   All TX GRANTED PDUs shown on sheet 4 of figure B.2 could be replaced by TX INTERRUPT PDUs.
NOTE 2:   The call clearing case shown on sheet 4 of figure B.2 is that where the call owner is registered in the group
          controlling SwMI and clears the call. All other possible call clearing cases result in the same TPI-Idle state.

Figure B.2 (sheet 4 of 6): Group controlling SwMI SDL
During the call, with delivery of mnemonic name and transmission request priority

Process Group_controlling_SwMI   During_call_with_name_and_no_priority(6)

TPI–Option–Name–
Caller–name–waiting

TPI–Option–Name

TX DMD.

RELEASE

TX DMD.

RELEASE

Trans.
granted?   No

TPI–Idle

Trans.
granted?   No

TPI–Idle

Yes

Yes

Include talking/sending
party identity in
TX GRANTED and
name in INFORM

Include talking/sending
party identity in
TX GRANTED and
name in INFORM

D–TX GRT.
with
INFORM

D–TX GRT.
with
INFORM

ISI–TX GRT.
with
INFORM

ISI–TX GRT.
with
INFORM

This case may happen when
the calling user is not a member
of the group and when his name
is not known

ISI-TX DMD
with NAME ACK?   Yes

No

Store talk./
send. user
mnem. name

–

TPI–Option–Name

–

NOTE 1: All TX GRANTED PDUs shown on sheet 5 of figure B.2 could be replaced by TX INTERRUPT PDUs.
NOTE 2: The call clearing case shown on sheet 5 of figure B.2 is that where the call owner is registered in the group
controlling SwMI and clears the call. All other possible call clearing cases result in the same TPI-Idle state.

Figure B.2 (sheet 5 of 6): Group controlling SwMI SDL
During the call, with delivery of mnemonic name (and no delivery of transmission request priority)

Process Group_controlling_SwMI   During_call_with_no_name(6)

```
        TPI–Option–                              TPI–Activated
        TX–Priority

  ┌─ TX DMD. ──┐    ┌─ RELEASE ──┐      ┌─ TX DMD. ──┐    ┌─ RELEASE ──┐

    Trans.        No                      Trans.        No
    granted?                              granted?
                    TPI–Idle                                TPI–Idle
     Yes                                    Yes
  Include talking party                  Include talking/
  ident. in TX GRANTED                   sending party
  and demand priority                    identity
      in INFORM                          in TX GRANTED

    D–TX GRT.                              D–TX GRT.
      with
     INFORM

   ISI–TX GRT.                            ISI–TX GRT.
      with
     INFORM

        –                                      –
```
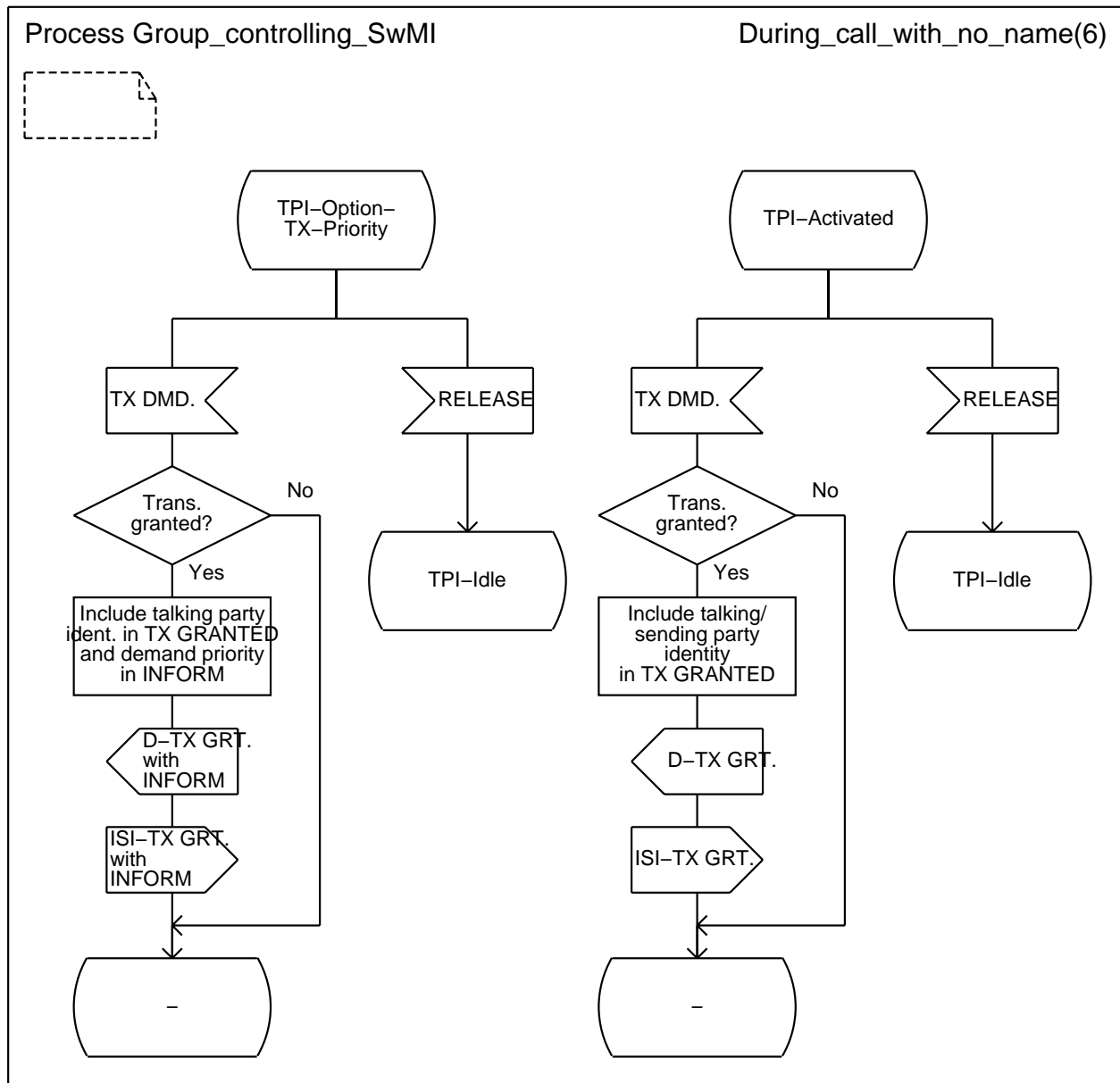
NOTE 1:   All TX GRANTED signals shown on sheet 6 of figure B.2 could be replaced by TX INTERRUPT signals.
NOTE 2:   The call clearing case shown on sheet 6 of figure B.2 is that where the call owner is registered in the group
          controlling SwMI and clears the call. All other possible call clearing cases result in the same TPI-Idle state.

Figure B.2 (sheet 6 of 6): Group controlling SwMI SDL
During the call, with no delivery of mnemonic name or of transmission request priority

B.3   SDL representation of SS-TPI at the served user SwMI

Figure B.3 shows the behaviour of an SS-TPI supplementary service control entity within the served user SwMI.

   NOTE: There are no activation, deactivation, definition or interrogation procedures defined for the served user
            SwMI. In the case where the served user would have some (limited) authorized user capabilities, the
            states applicable to that SwMI would be the corresponding ones of the authorized user SwMI (see
            clause B.6).

Input signals from the right, which are all named with the prefix ISI, represent PDUs received from the other SwMI in
an individual call or from the group controlling SwMI in a group call.

Output signals to the right, which exist only in an individual call, represent PDUs sent to the other SwMI.

Input signals from the left represent PDUs received from the served user MS.

Output signals to the left represent PDUs sent to the served user MS.
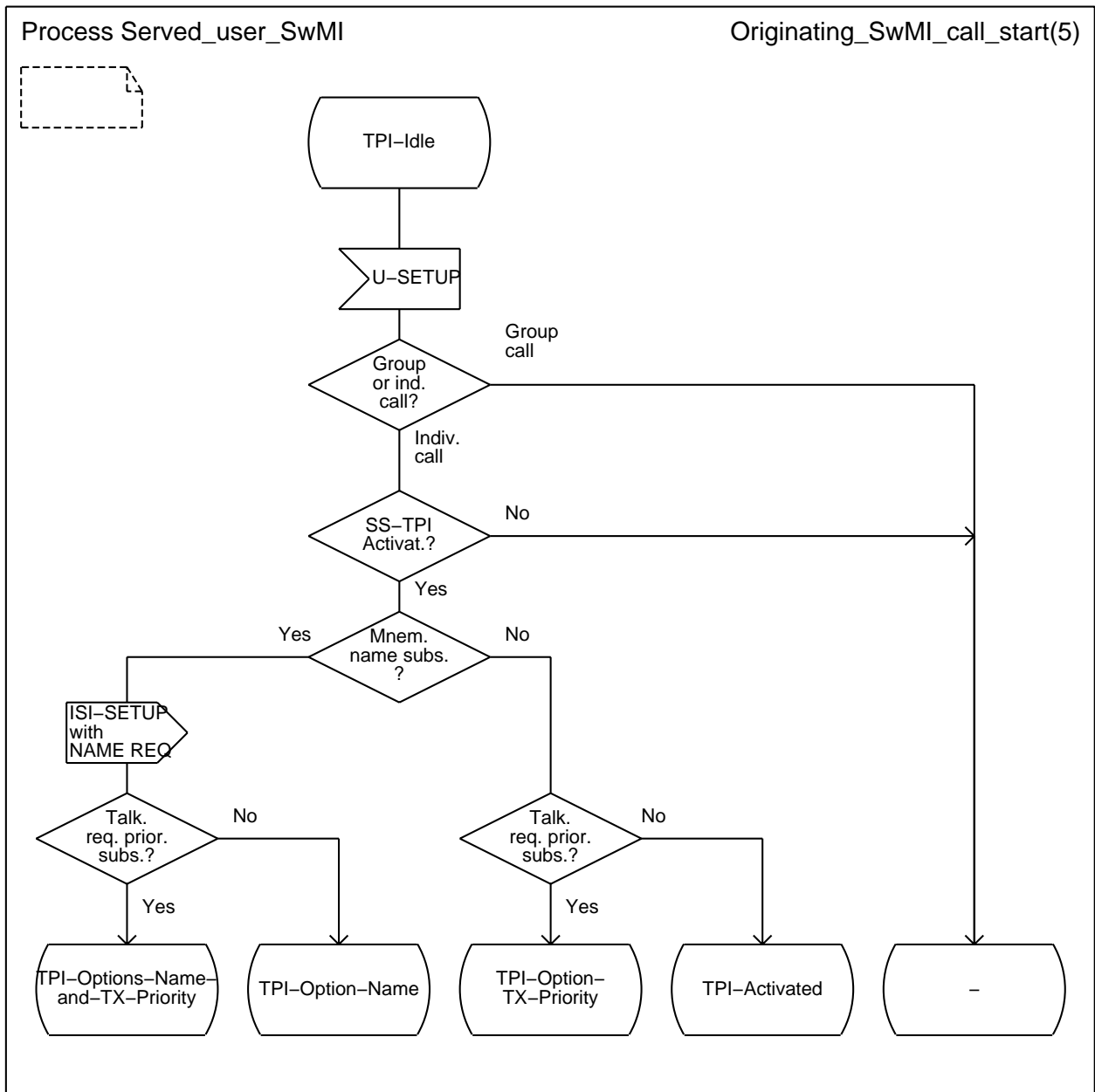
Figure B.3 (sheet 1 of 5): Served user SwMI SDL Originating SwMI - call start

Process Served_user_SwMI   Originating_SwMI_during_call(5)

Individual call case ---- *(TPI–Idle)   Group call case ---- TPI–Idle

ISI–CNNCT. with NAME ACK

ISI–CNNCT.

ISI–TX DEMAND

RELEASE

ISI–CNNCT. with INFORM

Store conncted user identity and mnemonic name

Store connected user identity

D–CNNCT. with INFORM

Trans. granted to the other user? — No

Trans. granted to the other user? — No

Trans. granted to the other user?

TPI–Idle

–

Yes

Yes

Yes

Include connected user identity and name in INFORM

Include connected user identity in INFORM

Include connected user identity in D–TX GRANTED

D–CNNCT. with INFORM

D–CNNCT. with INFORM

Option name invoked? — No

Yes

Include connected user name in INFORM

Option TX–Priority invoked? — No

Yes

Include demand priority in INFORM

D–TX GRT. with INFORM

–

NOTE 1:   All TX GRANTED PDUs shown on sheet 2 figure B.3 could be replaced by TX INTERRUPT PDUs.
NOTE 2:   The call clearing case shown on sheet 2 of figure B.3 is that where the call is cleared by the other SwMI. Any other possible call clearing cases shall result in the same TPI-Idle state.

Figure B.3 (sheet 2 of 5): Served user SwMI SDL Originating SwMI - during call

Process Served_user_SwMI   Terminating_participating_SwMI_call_start(5)

```
                                    ┌──────────────┐
                                   (   TPI-Idle    )
                                    └──────────────┘
                                           │
                                    ┌──────────────┐
                                    │  ISI-SETUP   ⟩
                                    └──────────────┘
                                           │
         Indiv. call              ╱──────────────╲            Group call
      ┌──────────────────────────⟨   Group        ⟩──────────────────────────┐
      │                           ╲  or ind.      ╱                           │
      │                            ╲  call?      ╱                            │
      │                             ╲──────────╱                             │
  ╱───────╲          No                                     No        ╱───────────╲
 ⟨ SS-TPI  ⟩──────────────────────────────────┐          ┌──────────⟨  INFORM     ⟩
 ⟨ Activat.?⟩                                  │          │          ⟨ with ISI-   ⟩
  ╲───────╱                                    │          │          ⟨  SETUP?     ⟩
      │ Yes                                     │          │           ╲───────────╱
 ┌──────────┐                                   │          │                │ Yes
 │ Store    │                                   │          │   No    ╱───────────╲
 │ calling  │                                   │          └────────⟨  Trans.     ⟩
 │ user     │                                   │                    ⟨ granted?    ⟩
 │ identity │                                   │                     ╲───────────╱
 └──────────┘                                   │                          │ Yes
      │                                         │                   ╱───────────╲   No
  ╱───────╲       Yes                           │                  ⟨ Talking     ⟩────┐
 ⟨ Trans.  ⟩────────────┐                       │                  ⟨ party =      ⟩    │
 ⟨ granted? ⟩           │                       │                  ⟨ calling user?⟩    │
  ╲───────╱             │                       │                   ╲───────────╱     │
      │ No       ╱──────────╲    No              │                        │ Yes        │
      │         ⟨ Talking    ⟩───────┐           │                  ┌──────────┐       │
      │         ⟨ party =     ⟩       │           │                  │ Include  │       │
      │         ⟨ calling user?⟩      │           │                  │ calling  │       │
      │          ╲──────────╱        │           │                  │ user     │       │
      │               │ Yes          │           │                  │ identity │       │
      │         ┌──────────┐         │           │                  │ in       │       │
      │         │ Include  │         │           │                  │ D-SETUP  │       │
      │         │ calling  │         │           │                  └──────────┘       │
      │         │ user     │         │           │                        │◄───────────┘
      │         │ identity │         │           │                  ┌──────────┐
      │         │ in       │         │           │                  │ D-SETUP  ⟩
      │         │ D-SETUP  │         │           │                  │ with     │
      │         └──────────┘         │           │                  │ INFORM   │
      │               │◄─────────────┘           │                  └──────────┘
      │         ┌──────────┐                     │                        │
      │         │ D-SETUP  ⟩                     │                  ┌──────────┐
      │         │ with     │                     │                  │    -     │
      │         │ INFORM   │                     │                  └──────────┘
      │         └──────────┘                     │
      └────────►│◄──────────┘                    │
           ╱──────────╲                          │
          ⟨ Mnem.      ⟩─────────────────────────┘
          ⟨ name subs. ⟩
          ⟨    ?        ⟩
           ╲──────────╱
      Yes  │          │  No
```

Yes	No		No

Mnem. name subs.?

Yes branch:
```
  ╱──────────╲   No
 ⟨ Talk.      ⟩──────┐
 ⟨ req. prior.⟩      │
 ⟨ subs.?     ⟩      │
  ╲──────────╱       │
      │ Yes          │
 ┌──────────┐  ┌──────────┐
 │ ISI-CNNCT⟩  │ ISI CNNCT⟩
 │ with NAME│  │ with     │
 │ and TX   │  │ NAME REQ │
 │ PR. REQ  │  └──────────┘
 └──────────┘       │
      │             │
 ┌──────────┐  ┌──────────┐
 │TPI-Options-Name│ TPI-Option-Name │
 │-and-TX-Priority│           │
 └──────────┘  └──────────┘
```

No branch:
```
  ╱──────────╲   No
 ⟨ Talk.      ⟩──────┐
 ⟨ req. prior.⟩      │
 ⟨ subs.?     ⟩      │
  ╲──────────╱       │
      │ Yes          │
 ┌──────────┐  ┌──────────┐
 │ ISI-CNNCT⟩  │          │
 │ with TX PR│  │          │
 │ REQUEST   │  │          │
 └──────────┘  │          │
      │        │          │
 ┌──────────┐  ┌──────────┐
 │TPI-Option-│  │ TPI-Activated │
 │TX-Priority│  │          │
 └──────────┘  └──────────┘
```

Figure B.3 (sheet 3 of 5): Served user SwMI SDL Terminating SwMI - call start

Process Served_user_SwMI   Terminating_SwMI_during_call(5)

Individual call case ---- * (TPI–Idle)

ISI–CNNCT. ACK with NAME ACK

Store calling user mnem. name

Trans. granted to the other user?   No

Yes

Include calling user name in INFORM

D–CNNCT. ACK with INFORM

ISI–TX GRT. with TX DMD PR.

Trans. granted to the other user?   No

Yes

Include calling user identity in D–TX GRANTED and dmd priority in INFORM

Option name invoked?   No

Yes

Include calling user name in INFORM

D–TX GRT. with INFORM

ISI–TX GRANTED

Trans. granted to the other user?   No

Yes

Include calling user identity in D–TX GRANTED

RELEASE

TPI–Idle

–

NOTE 1: All TX GRANTED PDUs shown on sheet 4 figure B.3 could be replaced by TX INTERRUPT PDUs.
NOTE 2: The call clearing case shown on sheet 4 of figure B.3 is that where the call is cleared by the other SwMI. Any other possible call clearing cases shall result in the same TPI-Idle state.

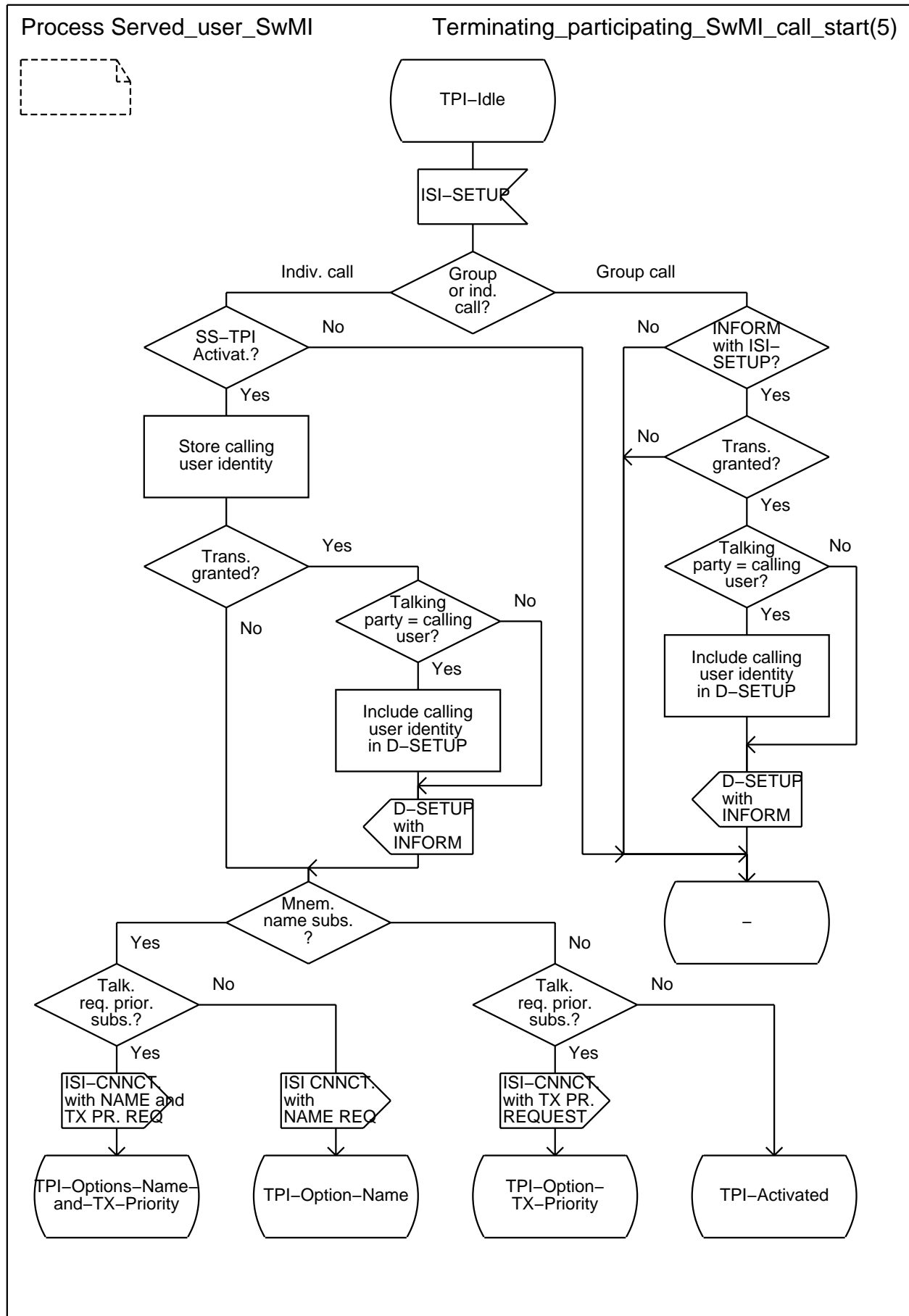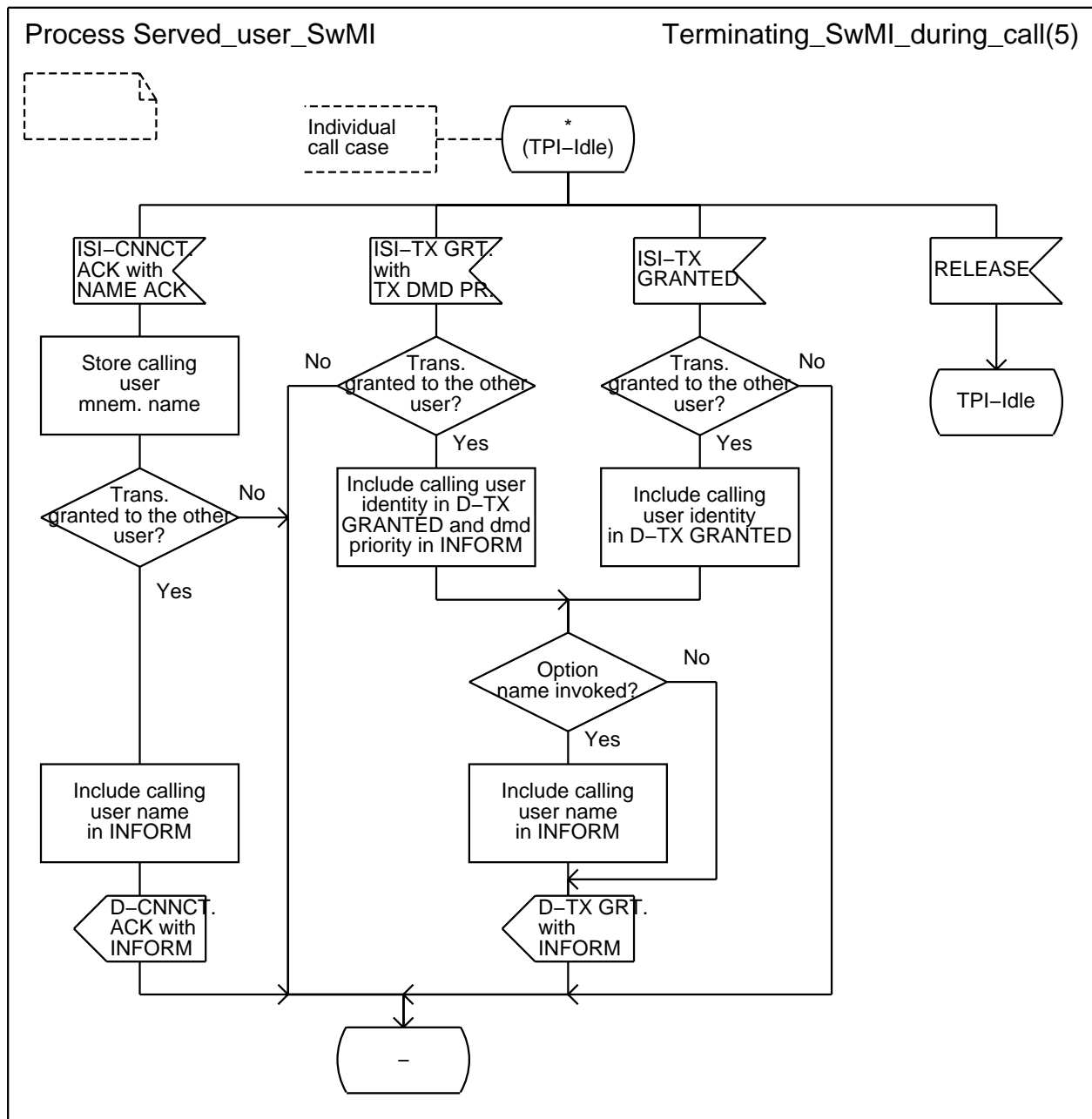**Figure B.3 (sheet 4 of 5): Served user SwMI SDL Terminating SwMI - during call**
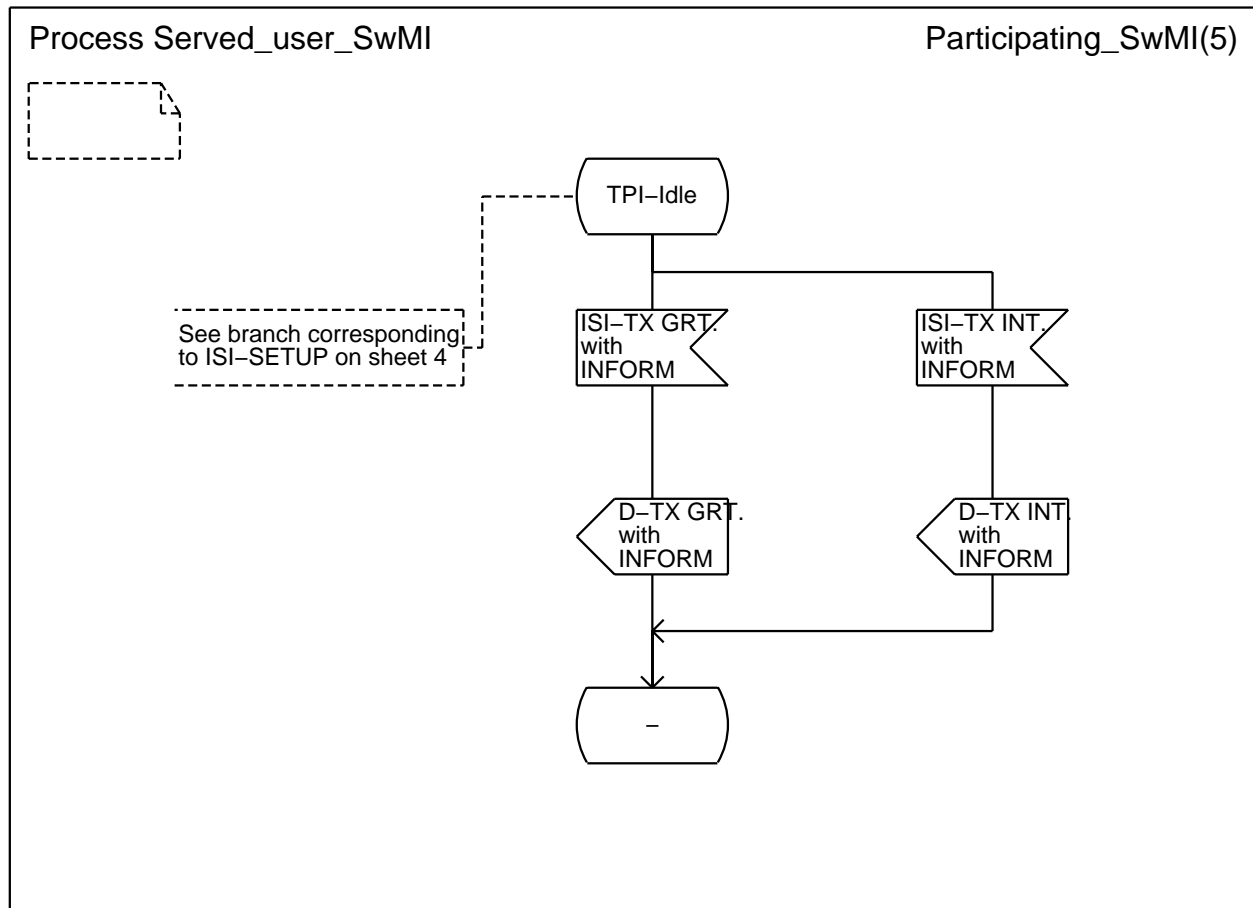
Process Served_user_SwMI   Participating_SwMI(5)

NOTE: A SwMI supporting SS-TPI can receive ISI-TX GRANTED or INTERRUPT PDUs while in the TPI-Idle state
         only during a group call.

Figure B.3 (sheet 5 of 5): Served user SwMI SDL Participating SwMI

B.4   SDL representation of SS-TPI at the talking/sending user SwMI

Figure B.4 shows the behaviour of an SS-TPI supplementary service control entity within the talking/sending user SwMI.
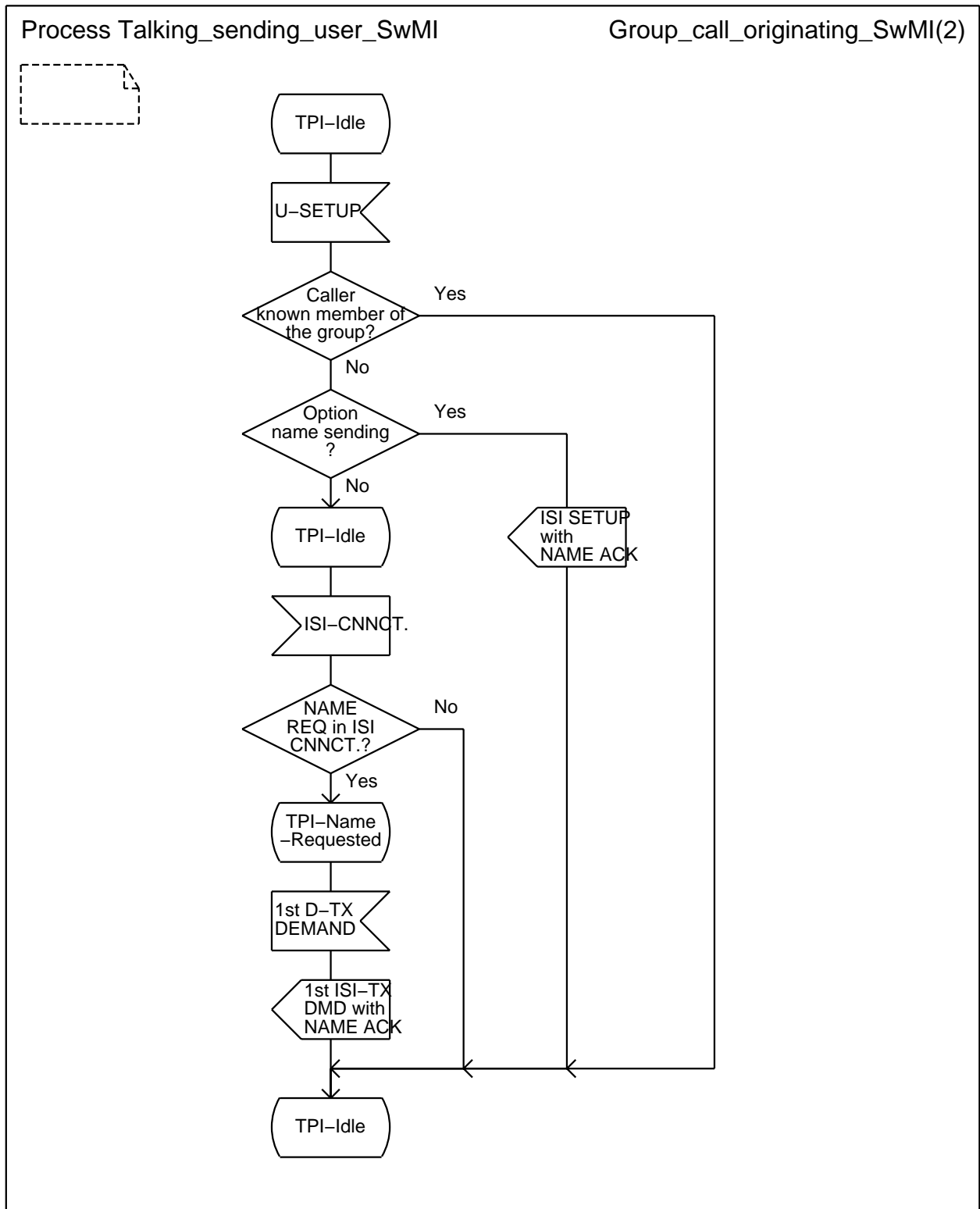
> NOTE 1: There are no activation, deactivation, definition or interrogation procedures defined for the talking/sending user SwMI. In the case where the talking/sending user would have some (limited) authorized user capabilities, the states applicable to this SwMI would be the corresponding ones of the authorized user SwMI (see clause B.6).

Input signals from the right represent air interface PDUs received from the calling user MS when the talking/sending user SwMI is the originating SwMI (whether in a group call or an individual call).

> NOTE 2: There are no output signals to the right, since no air interface SS-TPI PDUs are sent PDUs to the talking/sending user MS.

Input signals from the left represent ISI PDUs received from the group controlling SwMI in the case of group call, and from the other SwMI in the case of individual call.

Input signals to the left represent ISI PDUs sent to the group controlling SwMI in the case of group call, and to the other SwMI in the case of individual call.

Process Talking_sending_user_SwMI   Group_call_originating_SwMI(2)

(TPI–Idle)

> U–SETUP

Caller known member of the group? —— Yes ————→

No

Option name sending ? —— Yes ——→

No

(TPI–Idle)

> ISI–CNNCT.

NAME REQ in ISI CNNCT.? —— No ——↓

Yes

(TPI–Name –Requested)

> 1st D–TX DEMAND

1st ISI–TX DMD with NAME ACK

ISI SETUP with NAME ACK

(TPI–Idle)

Figure B.4 (sheet 1 of 2): Talking/sending user SwMI SDL Group call

NOTE 3: There is no SDL for the case where the talking/sending user SwMI is not the originating SwMI because the only possible participant in the call whose mnemonic name the group controlling SwMI does not know is the calling user - and the only purpose of the talking/sending user SwMI procedure is to get such unknown mnemonic name.
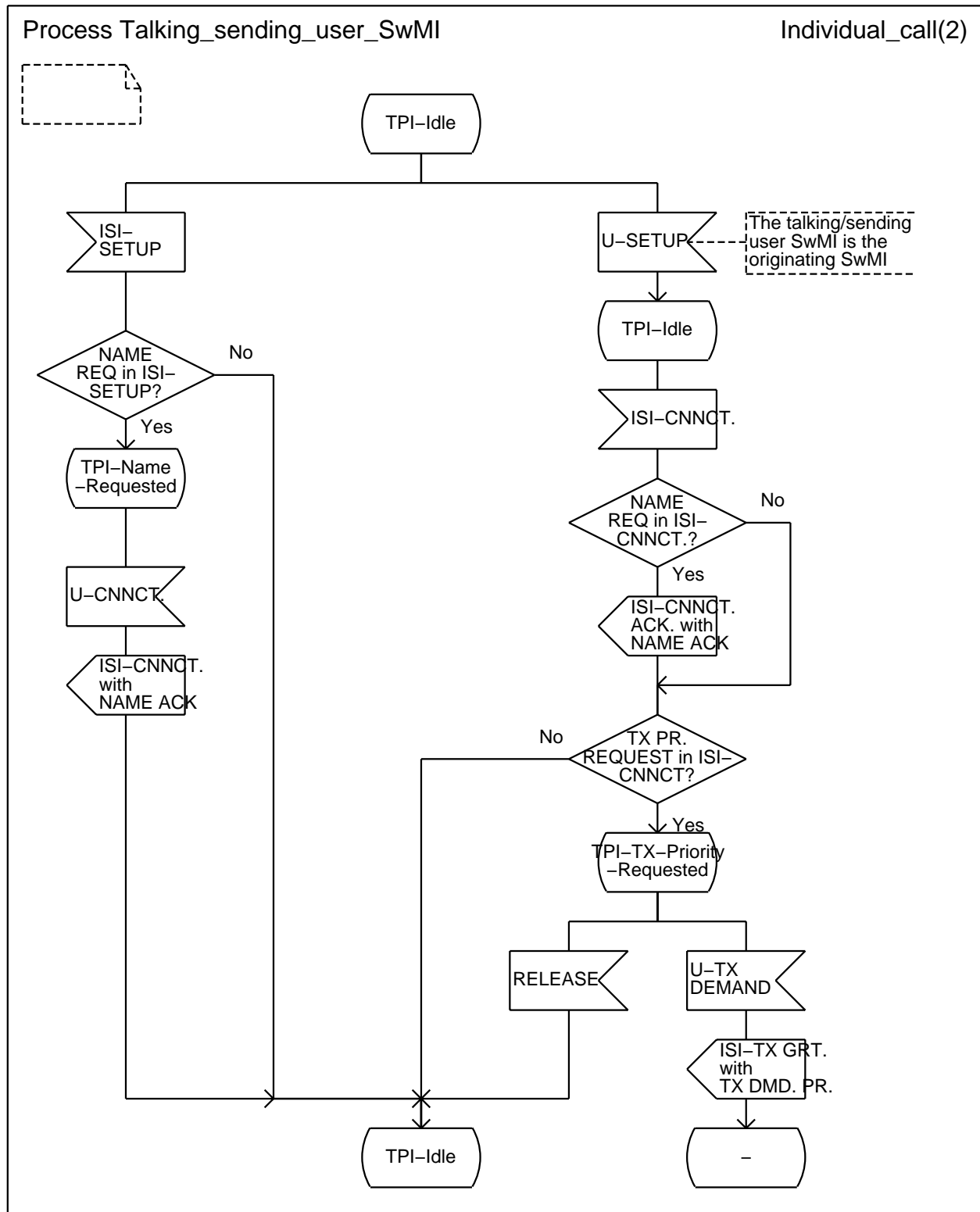
Figure B.4 (sheet 2 of 2): Talking/sending user SwMI SDL Individual call

B.5   SDL representation of SS-TPI at the authorized user MS

Figure B.5 shows the behaviour of an SS-TPI supplementary service control entity within the authorized user MS.

Input signals from the right represent air interface PDUs received from the authorized user SwMI.

Output signals to the right represent air interface PDUs sent to the authorized user SwMI.

Input signals from the left represent primitives from the authorized user application.

Output signals to the left represent primitives to the authorized user application.
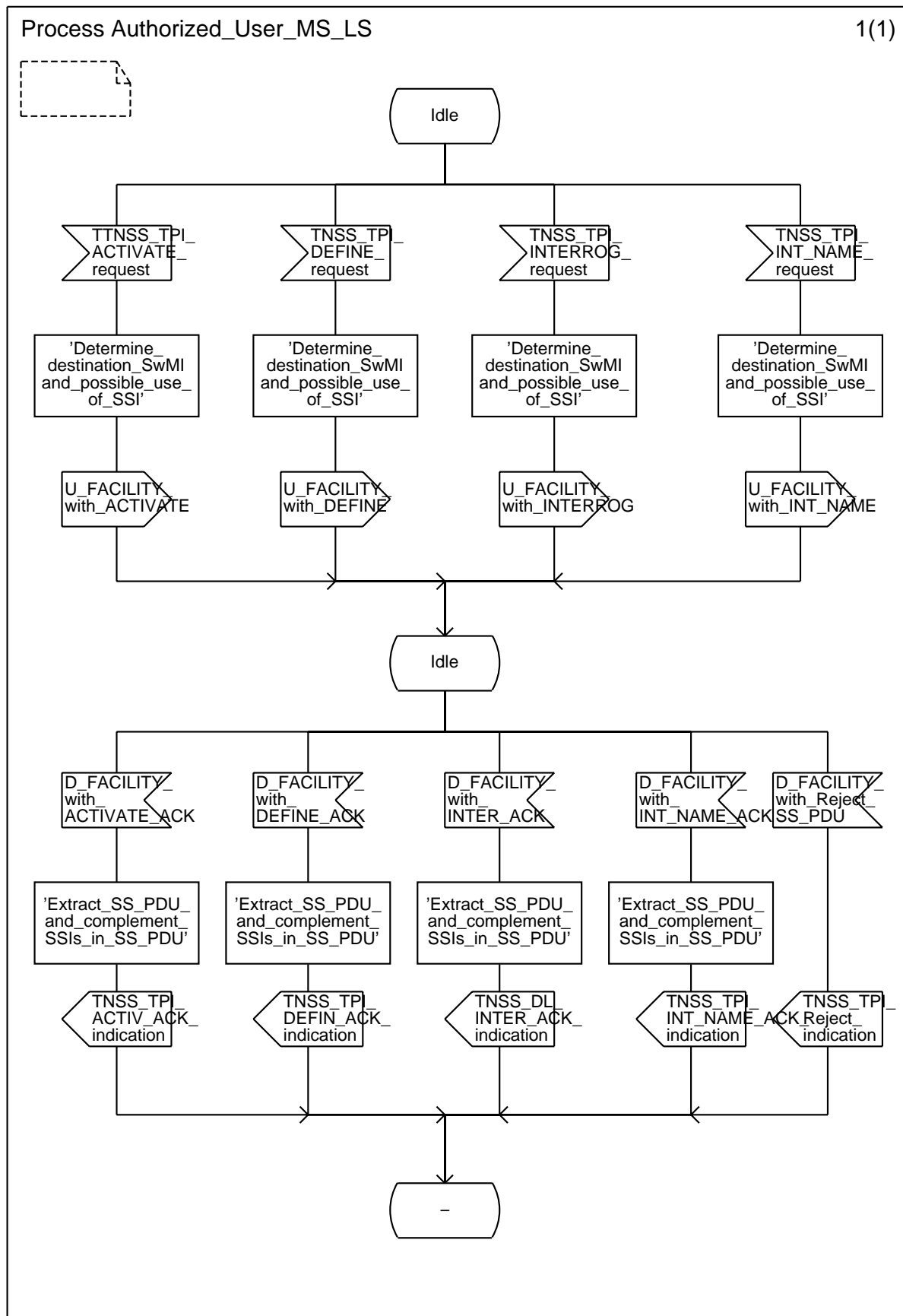
Process Authorized_User_MS_LS   1(1)

Idle

| TTNSS_TPI_ ACTIVATE_ request | TNSS_TPI_ DEFINE_ request | TNSS_TPI_ INTERROG_ request | TNSS_TPI_ INT_NAME_ request |

| 'Determine_ destination_SwMI and_possible_use_ of_SSI' | 'Determine_ destination_SwMI and_possible_use_ of_SSI' | 'Determine_ destination_SwMI and_possible_use_ of_SSI' | 'Determine_ destination_SwMI and_possible_use_ of_SSI' |

| U_FACILITY_ with_ACTIVATE | U_FACILITY_ with_DEFINE | U_FACILITY_ with_INTERROG | U_FACILITY_ with_INT_NAME |

Idle

| D_FACILITY_ with_ ACTIVATE_ACK | D_FACILITY_ with_ DEFINE_ACK | D_FACILITY_ with_ INTER_ACK | D_FACILITY_ with_ INT_NAME_ACK | D_FACILITY_ with_Reject_ SS_PDU |

| 'Extract_SS_PDU_ and_complement_ SSIs_in_SS_PDU' | 'Extract_SS_PDU_ and_complement_ SSIs_in_SS_PDU' | 'Extract_SS_PDU_ and_complement_ SSIs_in_SS_PDU' | 'Extract_SS_PDU_ and_complement_ SSIs_in_SS_PDU' | |

| TNSS_TPI_ ACTIV_ACK_ indication | TNSS_TPI_ DEFIN_ACK_ indication | TNSS_DL_ INTER_ACK_ indication | TNSS_TPI_ INT_NAME_ACK_ indication | TNSS_TPI_ Reject_ indication |

–

Figure B.5: Authorized user MS SDL

NOTE: In the case where the served user would have some (limited) authorized user capabilities, the SDL in
          figure B.5 would be applicable to the served user MS.

B.6   SDL representation of SS-TPI at the authorized user SwMI

Figure B.6 shows the behaviour of the supplementary service control entity specific to authorized user SwMI.

Depending on whether or not that SwMI is also the managed user home SwMI, it is or it not the destination SwMI of the ACTIVATE, DEFINE, INTERROGATE or INTERROGATE BY NAME PDUs sent by the authorized user MS.

Input signals from the right represent PDUs received from the managed user home SwMI.

Output signals to the right represent PDUs sent to the managed user home SwMI.

Input signals from the left represent PDUs received from the authorized user MS.

Output signals to the left represent PDUs sent to the authorized user MS.
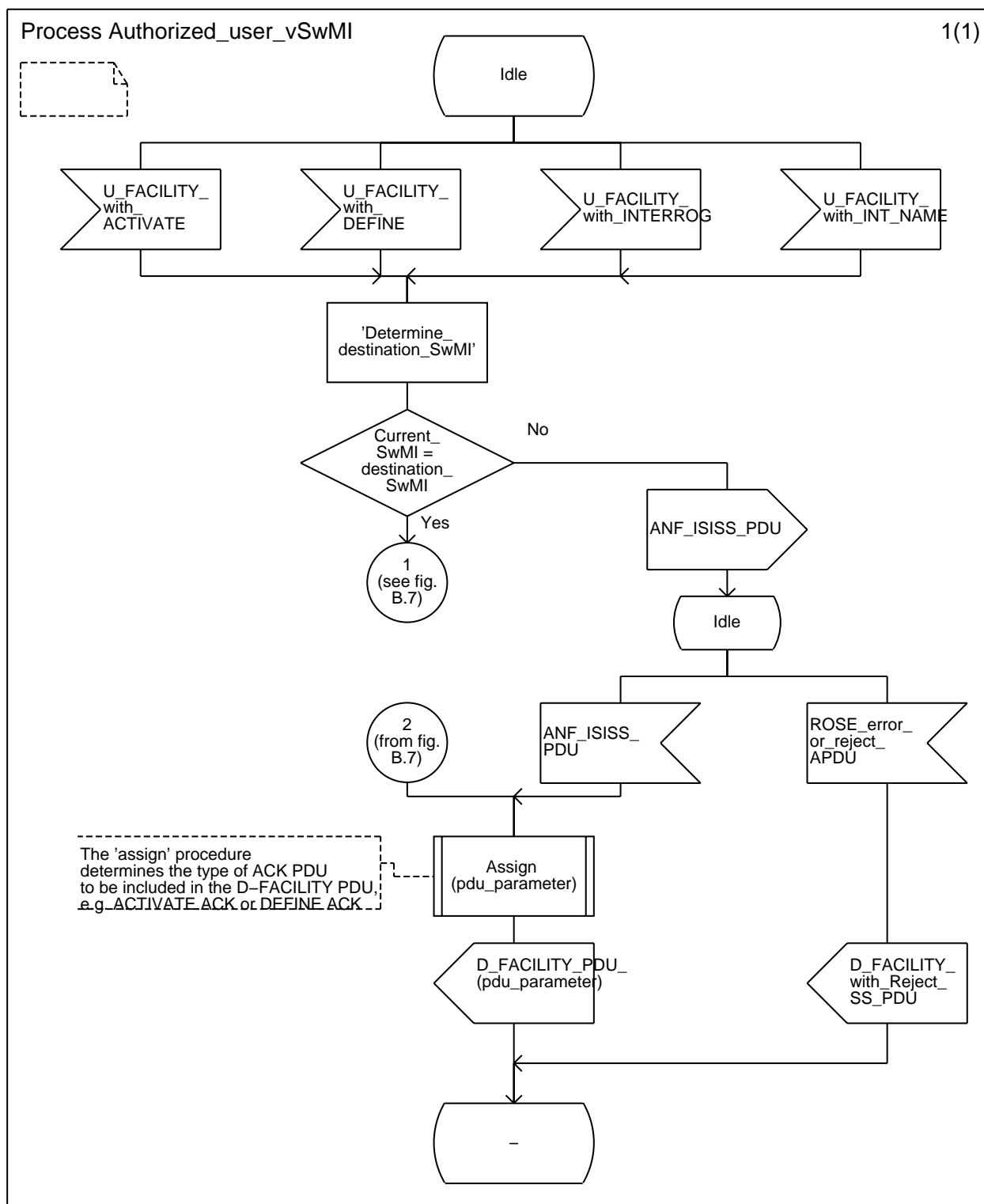
NOTE: Every ANF-ISISS PDU or ROSE APDU is conveyed by a PSS1 FACILITY message. The latter has not been shown in the corresponding signal symbols by lack of space.

Figure B.6: Authorized user SwMI SDL

NOTE 1: In the case where the served user would have some (limited) authorized user capabilities, the SDL in figure B.6 would be applicable to the SwMI where that user is registered.

NOTE 2: In the case where a user involved in the invocation or operation of some supplementary service would be registered in the same SwMI as the authorized user, the SDL applicable to the SwMI where the former user is registered would apply in addition to figure B.6 to the SwMI where the authorized user is registered.

B.7   SDL representation of SS-TPI at the managed user home SwMI

Figure B.7 shows the behaviour of the supplementary service control entity specific to the managed user home SwMI.

Input signals from the left represent PDUs received from the authorized user SwMI.

Output signals to the left represent PDUs sent to the authorized user SwMI.

Process Managed_user_home_SwMI   1(1)
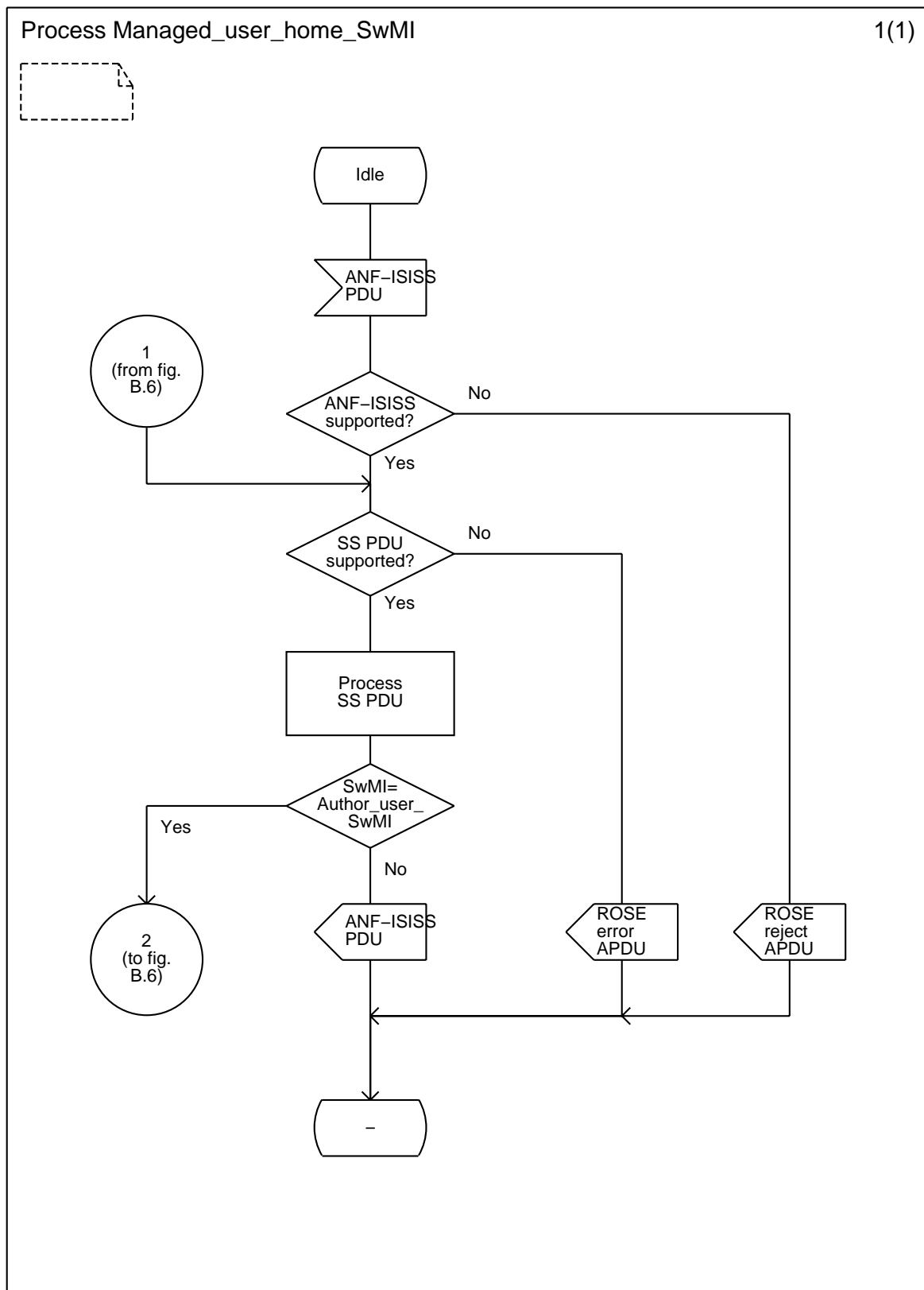
NOTE: Every ANF-ISISS PDU or ROSE APDU is conveyed by a PSS1 FACILITY message. The latter has not
          been shown in the corresponding signal symbols by lack of space.

Figure B.7: Managed user home SwMI SDL

NOTE: If the managed user home SwMI is involved in the invocation or operation of SS-TPI, e.g. because the
          managed user then becomes the served user, the SDL applicable to the corresponding SwMI would apply
          in addition to figure B.7.

Annex C (informative):
Bibliography

ETSI EN 300 392-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: General network design".

Annex D (informative):
Change Requests

The Change Requests defined in the table D.1 have been included into the present version of the present document.

Table D.1: Change Requests

No	CR vers.	Standard Version	Clauses affected	Title	CR Status
001	APP	Ed. 1	5.2.1.2, 5.2.1.3, 5.2.1.4, 5.2.1.5, 5.2.1.7, 5.2.1.8, 5.2.1.9	Encoding of name information	EPT approved 031008
002	APP	Ed. 1	5.2, 5.2.2.9	Editorial improvements	EPT approved 031008
003	APP	Ed. 1	4.3, 5.2.1.3, 5.2.1.5, 5.2.1.7, 5.2.1.8, 5.2.1.9, 5.2.1.11, 5.2.2.10, 5.2.2.15, 5.2.2.17, 5.2.2.18, 5.2.2.19, 5.2.2.20, 5.2.2.25	Text encoding scheme position in DEFINE PDU and mnemonic name harmonization	EPT approved 031008
004	APP	Ed. 1	5.2.1.3, 5.2.1.5	PDU encoding errors on the text encoding	EPT approved 031008
101	10	1.2.1	5.2.1.8	Mnemonic name length error in table 17	WG3 approved 050906
102	10	1.2.1	Many	Editorial corrections and alignments	WG3 approved 050906

History

Document history		
Edition 1	August 1999	Publication as ETS 300 392-12-3
V1.2.1	February 2004	Publication
V1.3.0	December 2005	One-step Approval Procedure OAP 20060421: 2005-12-21 to 2006-04-21