

ETSI EN 300 392-12-19 V1.1.1 (2001-08)

European Standard (Telecommunications series)

**Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 12: Supplementary services stage 3;
Sub-part 19: Barring of Incoming Calls (BIC)**



Reference

DEN/TETRA-03A-12-19

Keywords

radio, TETRA

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <http://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:
editor@etsi.fr

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2001.
All rights reserved.

Contents

Intellectual Property Rights	6
Foreword	6
1 Scope	8
2 References	8
3 Definitions, symbols and abbreviations	9
3.1 Definitions	9
3.2 Symbols	9
3.3 Abbreviations	9
3.3.1 General abbreviations	9
3.3.2 Supplementary service abbreviations	10
4 SS-BIC service description	10
4.1 General	10
4.2 SS-BIC services	10
4.3 Services at TNSS-SAP	11
4.3.1 General on services	11
4.3.2 CALL BARRED indication	11
4.3.3 DEFINE request	12
4.3.4 DEFINE indication	12
4.3.5 DEFINE EXTERNAL request	12
4.3.6 DEFINE EXTERNAL indication	13
4.3.7 DEFINE USER indication	13
4.3.8 DEFINE EXTERNAL USER indication	13
4.3.9 INTERROGATE request	14
4.3.10 INTERROGATE indication	14
4.4 Services at the TNCC-SAP	14
4.5 Parameter description	14
5 Signalling protocol for support of SS-BIC	17
5.1 General	17
5.2 SS-BIC Operational requirements	17
5.2.1 Requirements on the affected user MS/LS	17
5.2.2 Requirements on the affected user SwMI	17
5.2.3 Requirements on the calling user SwMI	17
5.2.4 Requirements on the calling user MS/LS	18
5.2.5 Requirements on the SS-BIC Restricted user home SwMI	18
5.3 SS-BIC Coding requirements	18
5.3.1 SS-BIC PDUs	18
5.3.1.1 DEFINE PDU	19
5.3.1.2 DEFINE ACK PDU	20
5.3.1.3 DEFINE EXTERNAL PDU	21
5.3.1.4 DEFINE USER PDU	22
5.3.1.5 DEFINE USER ACK PDU	22
5.3.1.6 DEFINE USER EXTERNAL PDU	23
5.3.1.7 INTERROGATE PDU	23
5.3.1.8 INTERROGATE ACK PDU	24
5.3.1.9 CALL BARRED PDU	25
5.3.1.10 Notification indicator	25
5.3.2 TETRA PDU Information Element Coding	26
5.3.2.1 Acknowledgement from affected user(s)	26
5.3.2.2 Affected user extension	26
5.3.2.3 Affected user extension present	26
5.3.2.4 Affected user SSI	26
5.3.2.5 BIC PDU type	27
5.3.2.6 Closed user group identifier	27

5.3.2.7	Definition result.....	28
5.3.2.8	Definition type.....	28
5.3.2.9	Delivery status to affected user(s)	28
5.3.2.10	Delivery to affected user(s).....	29
5.3.2.11	Distribution result.....	29
5.3.2.12	Exception to restricted extension.....	29
5.3.2.13	Exception to restricted extension present.....	29
5.3.2.14	Exception to restricted external number.....	29
5.3.2.15	Exception to restricted external number length indicator.....	30
5.3.2.16	Exception to restricted SSI.....	30
5.3.2.17	Interrogation result	30
5.3.2.18	Interrogation type	30
5.3.2.19	Number of service(s)	31
5.3.2.20	Range type for affected user identities.....	31
5.3.2.21	Range type for closed user groups.....	31
5.3.2.22	Range type for exceptions to restricted external numbers.....	31
5.3.2.23	Range type for restricted external numbers.....	31
5.3.2.24	Range type for restricted identities	31
5.3.2.25	Rejection cause.....	31
5.3.2.26	Restricted extension.....	32
5.3.2.27	Restricted extension present.....	32
5.3.2.28	Restricted external number.....	32
5.3.2.29	Restricted external number length indicator.....	32
5.3.2.30	Restricted SSI.....	32
5.3.2.31	Service	33
5.3.3	Additional coding requirements over the ISI.....	33
5.4	SS-BIC State Definitions.....	35
5.4.1	State at the calling user MS/LS.....	35
5.4.2	State at the calling user SwMI	35
5.4.3	State at the affected user MS/LS.....	35
5.4.4	State at the affected user SwMI	35
5.4.5	State at the authorized user MS/LS	35
5.4.6	State at the SS-BIC restricted user home SwMI	35
5.5	SS-BIC Signalling Procedures	35
5.5.1	Actions at Calling User MS/LS	35
5.5.2	Actions at Calling User SwMI.....	35
5.5.3	Actions at the authorized user MS/LS.....	35
5.5.3.1	Normal procedures at the authorized user MS/LS	36
5.5.3.2	Exceptional procedures at the authorized user MS/LS.....	36
5.5.4	Actions at the SS-BIC control entity at the SwMI where the authorized user is registered.....	36
5.5.4.1	Normal procedures at the SS-BIC control entity at the SwMI where the authorized user is registered.....	36
5.5.4.2	Exceptional procedures at the SS-BIC control entity at the SwMI where the authorized user is registered.....	37
5.5.5	Actions at the SS-BIC restricted user home SwMI	37
5.5.5.1	Normal procedures	37
5.5.5.2	Exceptional procedures at the SS-BIC control entity at the SS-BIC restricted user home SwMI.....	38
5.5.6	Actions at the affected (called/barred) user SwMI.....	39
5.5.7	Actions at the affected (called/barred) user MS/LS	39
5.6	Impact of Inter-working with Public ISDN.....	39
5.6.1	General.....	39
5.6.2	SS-BIC for Incoming Call from Public ISDN to TETRA	39
5.6.3	SS-BIC for Incoming Call from TETRA to public ISDN	39
5.7	Protocol interactions between SS-BIC and other supplementary services and ANFs.....	39
5.7.1	Protocol interactions between SS-BIC and other supplementary services.....	39
5.7.2	Protocol interactions between SS-BIC and ISI-IC-ANF	40

Annex A (normative): Specification and Description Language (SDL) representation of call related procedures41

A.1	SDL representations of SS-BIC at calling user MS/LS	42
-----	---	----

A.2	SDL representations of SS-BIC at calling user SwMI.....	43
A.3	SDL representations of SS-BIC at authorized user MS/LS.....	44
A.4	SDL representations of SS-BIC at SwMI where authorized user is registered	46
A.5	SDL representation of SS-BIC at SS-BIC called user home SwMI	48
A.6	SDL representation of SS-BIC at SS-BIC called user MS/LS	50
Annex B (informative):	Bibliography.....	51
History		52

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.org/ipr>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document had been submitted to Public Enquiry as ETS 300 392-12-19. During the processing for Vote it was converted into an EN.

The present document is part 12, sub-part 19 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

- Part 1: "General network design";
- Part 2: "Air Interface (AI)";
- Part 3: "Interworking at the Inter-System Interface (ISI)";
- Part 4: "Gateways basic operation";
- Part 5: "Peripheral Equipment Interface (PEI)";
- Part 7: "Security";
- Part 9: "General requirements for supplementary services";
- Part 10: "Supplementary services stage 1";
- Part 11: "Supplementary services stage 2";
- Part 12: "Supplementary services stage 3";**
- Part 13: "SDL model of the Air Interface (AI)";
- Part 14: "Protocol Implementation Conformance Statement (PICS) proforma specification";
- Part 15: "TETRA frequency bands, duplex spacings and channel numbering";
- Part 16: "Network Performance Metrics";
- Part 17: "TETRA V+D and DMO Release 1.1 specifications".

National transposition dates

Date of adoption of this EN:	3 August 2001
Date of latest announcement of this EN (doa):	30 November 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2002
Date of withdrawal of any conflicting National Standard (dow):	31 May 2002

1 Scope

The present document defines the stage 3 specification of the Barring of Incoming Call (BIC) supplementary service for the Terrestrial Trunked Radio (TETRA).

SS-BIC supplementary service enables barring restrictions for incoming services, e.g. calls, to be set. SS-BIC specifies the definition, interrogation and operation of the supplementary service. The Switching and Management Infrastructure (SwMI) applies the SS-BIC definitions when an incoming service is requested for the restricted user. The SS-BIC actions are defined for the SwMI, for the Mobile Station (MS) and for the Line Station (LS). The SS-BIC information flows may be delivered over the Inter System Interface (ISI).

SS-BIC is invoked for incoming services within one TETRA system or for services that extend over ISI to several TETRA systems.

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

Signalling in packet data service is outside the scope of the present document.

According to ITU-T Recommendation I.130 [7], supplementary service stage 3 specification is preceded by the stage 1 and the stage 2 specifications of the service. Stage 1 describes the functional capabilities from the user's point of view. Stage 2 defines the functional behaviour in terms of functional entities and information flows. Stage 3 gives a precise description of the Supplementary Service from the protocol point of view. It defines the protocol for the service and the encoding rules for the information flows. It defines the processes for the functional entities and their behaviour. The described protocols and behaviour apply to the SwMI, for the MS and for the LS and may be applied over the ISI between TETRA systems. Aspects relating to all supplementary services are detailed in EN 300 392-9 [5].

2 References

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

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

- [1] ETSI EN 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".
- [2] ETSI ETS 300 392-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 1: General network design".
- [3] ETSI ETS 300 392-10-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 1: Call identification".
- [4] ETSI ETS 300 392-10-6: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 6: Call Authorized by Dispatcher (CAD)".
- [5] ETSI EN 300 392-9: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".
- [6] ITU-T Recommendation Z.100 (1993): "Specification and description language (SDL)".
- [7] ITU-T Recommendation I.130: "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [8] ETSI ETS 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".

- [9] 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)".
- [10] ITU-T Recommendation X.219: "Remote Operations: Model, notation and service definition".
- [11] ITU-T Recommendation X.229: "Remote Operations: Protocol specification".
- [12] ITU-T Recommendation X.217: "Information technology - Open Systems Interconnection - Service definition for the Association Control Service Element".
- [13] ETSI ETS 300 392-10-19: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 19: Barring of incoming calls".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

affected user: user whose incoming service or services are barred

authorized user: user who is permitted to define SS-BIC on affected user's behalf

calling party: party whose outgoing service request is barred due to SS-BIC

NOTE: Also defined as affected user.

packet data service: packet mode data service, see EN 300 392-2, clause 28

restricted party: user whose outgoing service or services to the affected user are barred

3.2 Symbols

For the purposes of the present document, the symbols used in SDL representations of procedures according to ITU-T Recommendation Z.100 [6] apply.

3.3 Abbreviations

3.3.1 General abbreviations

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

CC	Call Control sub-entity for SS-BIC in CMCE in SwMI
CMCE	Circuit Mode Control Entity
ISI	Inter System Interface
LS	Line Station
MCC	Mobile Country Code
MNC	Mobile Network Code
MS	Mobile Station
PDU	Protocol Data Unit
SAP	Service Access Point
SS	Supplementary Service
SS-BIC	Supplementary Service Barring of Incoming Call
SSI	Short Subscriber Identity
SwMI	Switching and Management Infrastructure
TETRA	Terrestrial Trunked Radio
TNCC-SAP	Call Control service access point

TNSS-SAP	Supplementary Service Service Access Point
TSI	TETRA Subscriber Identity

3.3.2 Supplementary service abbreviations

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

BIC	Barring of Incoming Calls
CAD	Call Authorized by Dispatcher
SNA	Short Number Addressing

4 SS-BIC service description

4.1 General

SS-BIC supplementary service enables barring restrictions for incoming services, e.g. calls, to be set. SS-BIC specifies the definition, interrogation and operation of the supplementary service. The Switching and Management Infrastructure (SwMI) applies the SS-BIC definitions when an incoming service is requested for the restricted user. The SS-BIC actions are defined for the SwMI, for the Mobile Station (MS) and for the Line Station (LS). The SS-BIC information flows may be delivered over the Inter System Interface (ISI).

This supplementary service is applicable to all basic circuit mode speech and data services defined in EN 300 392-2 [1] as well as to SDS mode services.

4.2 SS-BIC services

SS-BIC is an optional supplementary service for TETRA voice plus data layer 3. If SS-BIC is supported, this clause shall specify the services and their availability.

The following SS-BIC services shall be provided:

- barring indication: barring indication for a basic service (call control service).

NOTE 1: The barring indication for SDS service is outside the scope of the present document.

The following SS-BIC services may be provided:

- definition: a request to define SS-BIC into the SwMI;
- definition information: the reception of SS-BIC definition for information;
- interrogation: interrogation of SS-BIC definition.

The SS-BIC service access point may be used in conformance testing as a normative (but potentially not accessible) boundary in MSs and LSs.

NOTE 2: As the present document only deals with the SS-BIC all the service primitives have been shown without a TNSS-BIC-prefix e.g. the TNSS-BIC SERVICE request is shorten into the SERVICE request.

NOTE 3: As man-machine interface or User A MS/LS applications are outside the scope of this standard service primitives are used to define information exchange to and from the standardized part of the MS/LS. Those primitives may be only indirectly accessible.

NOTE 4: The layer 3 services and service boundary for the SwMI are outside the scope of the present document.

The SS-BIC services described in this clause shall complement the call control service specified in EN 300 392-2 [1], clause 11.

4.3 Services at TNSS-SAP

4.3.1 General on services

The SS-BIC definition, user definition and interrogation shall be provided at TNSS-SAP.

The SS-BIC service primitives for the authorized user MS/LS at the TNSS-SAP may be:

- DEFINE request;
- DEFINE indication;
- DEFINE EXTERNAL request;
- DEFINE EXTERNAL indication;
- INTERROGATE request; and
- INTERROGATE indication.

The SS-BIC service primitives for the affected user MS/LS at the TNSS-SAP may be:

- DEFINE USER indication;
- DEFINE EXTERNAL USER indication;
- INTERROGATE request; and
- INTERROGATE indication.

The SS-BIC service primitives for the calling user MS/LS at the TNSS-SAP may be:

- CALL BARRED indication;
- NOTIFICATION indication.

NOTE: In the present document primitives request and indication are used instead of request and confirmation as there may not be a one to one correspondence between those primitives, e.g. there can be multiple indications due to a single request.

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

- Remark: comment;
- C: conditional;
- O: optional;
- M: mandatory.

4.3.2 CALL BARRED indication

CALL BARRED indication indicates to the calling user that the basic service invocation has been barred due to SS-BIC.

The CALL BARRED request primitive shall contain the SS-BIC parameters listed in table 1.

Table 1: Parameters for the primitive CALL BARRED indication

Parameter	Indication
Reject cause	M

NOTE: Also NOTIFICATION indication is available for informing the calling user, refer to EN 300 392-9 [5], clauses 5.2 and 7.2.2.

4.3.3 DEFINE request

The DEFINE request primitive shall be sent by the authorized user to the SS-BIC controlling entity over TNSS-SAP to define BIC supplementary service on affected user behalf. If there are several subscriber identities given in the primitive, the definition result shall be valid to all identities.

The DEFINE request primitive shall contain the SS-BIC parameters listed in table 2.

Table 2: Parameters for the primitive DEFINE request

Parameter	Request
Affected user identity	M, see note 1
Definition type	M
Services	M
Closed user groups	C, see note 2
Restricted identities	C, see note 2
Exceptions to restricted identities	M, see note 2
Delivery to affected user(s)	M
Acknowledgement requested	M
NOTE 1: Repeatable.	
NOTE 2: Parameter may be present only if the definition type is addition or replacement.	

4.3.4 DEFINE indication

The DEFINE indication primitive shall be sent to the authorized user by the SS-BIC controlling entity over TNSS-SAP to confirm the SS-BIC definition. If there are several subscriber identities given in the primitive, the definition results shall be valid to all identities. There may be multiple DEFINE indications due to a single DEFINE request.

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

Table 3: Parameters for the primitive DEFINE indication

Parameter	Indication
Affected user identity	M
Definition result	M

4.3.5 DEFINE EXTERNAL request

The DEFINE EXTERNAL request primitive shall be sent by the authorized user to the SS-BIC controlling entity over TNSS-SAP to define BIC supplementary service on affected user behalf. If there are several external subscriber identities given in the primitive, the definition result shall be valid to all identities.

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

Table 4: Parameters for the primitive DEFINE EXTERNAL request

Parameter	Request
Affected user identity	M, see note 1
Definition type	M
Services	M
Closed user groups	C, see note 2
Restricted identities	C, see note 2
Exceptions to restricted identities	M, see note 2
Delivery to affected user(s)	M
Acknowledgement requested	M
NOTE 1: Repeatable.	
NOTE 2: Parameter may be present only if the definition type is addition or replacement.	

4.3.6 DEFINE EXTERNAL indication

The DEFINE EXTERNAL indication primitive shall be sent to the authorized user by the SS-BIC controlling entity over TNSS-SAP to confirm the SS-BIC definition. If there are several subscriber identities given in the primitive, the definition results shall be valid to all identities. There may be multiple DEFINE EXTERNAL indications due to a single DEFINE EXTERNAL request.

The DEFINE EXTERNAL indication primitive shall contain the SS-BIC parameters listed in table 5.

Table 5: Parameters for the primitive DEFINE EXTERNAL indication

Parameter	Indication
Affected user identity	M
Definition result	M

4.3.7 DEFINE USER indication

The DEFINE USER indication primitive may be sent to the affected (called/barred) user by the SS-BIC controlling entity over TNSS-SAP to indicate SS-BIC definition made on affected user.

The DEFINE USER request primitive shall contain the SS-BIC parameters listed in table 6.

Table 6: Parameters for the primitive DEFINE USER indication

Parameter	Indication
Definition type	M
Services	M
Closed user groups	C, see note
Restricted identities	C, see note
Exceptions to restricted identities	C, see note
Acknowledgement requested	M
NOTE: Parameter may be present only if the definition type is addition or replacement.	

4.3.8 DEFINE EXTERNAL USER indication

The DEFINE EXTERNAL USER indication may be sent to the affected (called/barred) user by the SS-BIC controlling entity over TNSS-SAP to indicate SS-BIC definition made on affected user. The DEFINE EXTERNAL USER ACK indication primitive shall contain the SS-BIC parameters listed in table 7.

Table 7: Parameters for the primitive DEFINE EXTERNAL USER indication

Parameter	Indication
Definition type	M
Services	M
Closed user groups	C, see note
Restricted external numbers	C, see note
Exceptions to restricted external numbers	C, see note
Acknowledgement requested	M
NOTE: Parameter may be present only if the definition type is addition or replacement.	

4.3.9 INTERROGATE request

INTERROGATE request shall be sent either from authorized user or from affected user to the SS-BIC controlling entity over TNSS-SAP to interrogate a SS-BIC definition. The primitive shall contain parameters listed in table 8.

Table 8: Parameters for the primitive INTERROGATE request

Parameter	Request
Affected user identity	M, see note
NOTE: May be repeatable.	

4.3.10 INTERROGATE indication

INTERROGATE indication shall be offered to either authorized user or to affected user (called/barred) by the SS-BIC controlling entity over TNSS-SAP as a response to a previously sent interrogation request. INTERROGATE indication shall contain the parameters listed in table 9. There may be multiple INTERROGATE indications due to a single INTERROGATE request.

If there are several subscriber identities given in the primitive, the following definitions shall be valid to all the identities. Interrogation result indicates if the interrogation was allowed and/or if SS-BIC is defined for the given identity or identities. For other parameter definitions, see DEFINE request.

Table 9: INTERROGATE indication contents

Parameter	Indication
Affected user identity	M, see note 1
Interrogation result	M
Services	M
Closed user groups	C, see note 2
Restricted user identities/external subscriber numbers	C, see note 2
Exceptions to restricted user identities/external subscriber numbers	C, see note 2
Delivery status to affected user(s)	C, see note 2
NOTE 1: May be repeatable.	
NOTE 2: Parameter may be present only if the Interrogation result is:	
- accepted, TETRA identities provided; or	
- accepted, external subscriber numbers provided.	

4.4 Services at the TNCC-SAP

The SS-BIC barring indication for call control service may be provided at TNCC-SAP.

The SS-BIC service element may be carried as an element within the TNCC-RELEASE indication primitive over TNCC-SAP. The barring shall be indicated in TNCC-RELEASE primitive as Disconnect cause parameter having the value not allowed traffic case. For a detailed description of the call control service primitives refer to EN 300 392-2 [1], clause 11.3.

4.5 Parameter description

Acknowledgement requested =

- acknowledgement requested from affected user(s);
- acknowledgement not requested from affected user(s).

NOTE 1: Acknowledgement from affected user(s) indicates if the affected users shall acknowledge the received definition information.

Affector user identity =

- TETRA Subscriber Identity (TSI) = Mobile Country Code (MCC) + Mobile Network Code (MNC)
- + Short Subscriber Identity (SSI); or
- Short Subscriber Identity (SSI), See ETS 300 392-1 [2], clause 7.

Closed user group =

- a set of users belonging together, the contents definition is network dependent.

Definition result =

- request rejected for undefined reason;
- accepted by SwMI;
- accepted but some definition values changed by SwMI;
- user not authorized;
- unknown TETRA identity;
- parameters not valid;
- insufficient information.

NOTE 2: Definition result: shall indicate the outcome of the definition request for the affected users given in the DEFINE ACK PDU. However, the result does not indicate neither of the following:

- if the definition information is successfully sent to the affected user(s);
- in case of result value "accepted, but definition values changed by SwMI" does not indicate what was changed.

NOTE 3: If a definition is requested for a range of affected users, the "definition result" may be different for different affector users and several DEFINE-ACK PDUs are sent to authorized user.

Definition type =

- replacement;
- addition;
- removal.

NOTE 4: Definition type indicates if the given restrictions are used to replace previous restrictions, add new restrictions or remove previous restrictions.

NOTE 5: Replace may apply to the case where no restrictions existed; in that case it is equivalent to definition.

NOTE 6: Removal is used to remove all SS-BIC definitions.

Delivery to affected user(s) =

- delivery to affected user(s);
- no delivery to affected user(s).

NOTE 7: Delivery to affected user(s) indicates that SwMI is requested to send the SS-BIC definition to affected user(s) for his (their) information.

Digit =

- 0;
- 1;
- etc.
- 9; and optionally
- *;
- #;
- +.

Distribution result =

- successfully received by MS/LS;
- request failed for any reason;
- parameters not valid;
- insufficient information.

Exception to restricted external numbers =

- external number.

NOTE 8: Exception to restricted external numbers allows services requested by a user whose number is indicated.

Exceptions to restricted identities =

- TETRA identity.

NOTE 9: Exception to restricted user identities allows services requested by a user whose identity is indicated.

Interrogation result =

- accepted;
- accepted, TETRA identities provided;
- accepted, external subscriber numbers provided;
- request failed for any reason;
- user not authorized;
- unknown TETRA identity;
- parameters not valid;
- insufficient information.

Interrogation type =

- TETRA identities;
- external numbers; or
- both.

Restricted external numbers =

- external numbers from which calls are barred.

Restricted identities =

- TETRA identities from which calls are barred.

Services =

- all applicable services;
- circuit mode speech service;
- circuit mode data service;
- SDS.

NOTE 10:Service causes barring of the given service.

Services outside closed user group causes barring of service requests received from a party outside the given closed group.

NOTE 11:The closed user group definition is outside the scope of the present document.

5 Signalling protocol for support of SS-BIC

5.1 General

This clause defines the SS-BIC layer 3 protocol for the SS-BIC services specified in clause 5. The SS-BIC protocol comprises of sub-protocols defined for SS and call control within CMCE. These SS-BIC sub-protocols complement the call control protocol defined in EN 300 392-2 [1], clause 14.

The present document is only normative for the protocol architecture and user application SAPs within the MS/LS, but gives an informative description of the protocol and the SAPs within the SwMI.

NOTE: The internal communication between processes within CMCE is outside the scope of ETS and will only be mentioned as informative statements.

5.2 SS-BIC Operational requirements

5.2.1 Requirements on the affected user MS/LS

The affected (called/barred) user MS/LS 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 unrelated requirements in clauses 7 and 11 of EN 300 392-9 [5].

5.2.2 Requirements on the affected user SwMI

That SwMI shall support the affected user MS/LS complying with the requirements for individual calls set in EN 300 392-2 [1] clause 14 and in EN 300 392-9 [5].

If the call is over the ISI, the affected user SwMI shall comply with the corresponding ISI requirements, set in EN 300 392-3-2 [9] for individual calls. It shall also comply with the relevant call unrelated in clauses 9 to 11 of EN 300 392-9 [5].

5.2.3 Requirements on the calling user SwMI

The calling user SwMI shall support the incoming individual call set-up and release as specified in EN 300 392-2 [1].

If the call is over the ISI, the calling user SwMI shall comply with the corresponding ISI requirements, set in EN 300 392-3-2 [9] for individual calls. It shall also comply with the relevant call related requirements in clauses 9 to 11 of EN 300 392-9 [5].

5.2.4 Requirements on the calling user MS/LS

The calling user MS/LS shall comply with the call setup and call release requirements of EN 300 392-2 [1], clause 14.

NOTE: The calling user MS/LS needs only to recognize the different notification values associated with call disconnect due to SS-BIC.

5.2.5 Requirements on the SS-BIC Restricted user home SwMI

The SS-BIC SwMI shall support the individual call set-up and release as specified in EN 300 392-2 [1]. If the call is over the ISI, the SS-BIC Restricted user home SwMI shall comply with the corresponding ISI requirements, set in EN 300 392-3-2 [9] for individual calls. It shall comply with the relevant call related requirements in clauses 9 to 11 of EN 300 392-9 [5]. It shall comply with the call unrelated requirements in EN 300 392-9 [5].

5.3 SS-BIC Coding requirements

5.3.1 SS-BIC PDUs

The Facility element, which is used to convey the supplementary service information specified in this clause to and from the MS/LS and over the ISI, shall be transported:

- in any call control PDU, if the MS/LS is engaged in the same call set-up; or
- in a D-FACILITY or U-FACILITY PDU, if the MS/LS is not engaged in any call.

However, CALL-BARRED shall be conveyed in the FACILITY element in D-RELEASE PDU and it can be conveyed in D-DISCONNECT PDU. Notification indicator in those PDUs may be used to carry the call barring information.

The element coding shall be in accordance with the general rules specified in EN 300 392-2 [1], annex E.

The PDU element coding (independently of bearer PDU) for SS-BIC is detailed in the following clauses.

5.3.1.1 DEFINE PDU

The DEFINE PDU may be offered from the authorized user MS/LS to the SS-BIC affected user home SwMI. The DEFINE PDU shall have the format as shown in table 10.

Table 10: DEFINE PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	DEFINE
Range type for affected user identities	4	1	M	
Affected user SSI	24	1	M	see note 1
Affected user extension present	1	1	M	see note 1
Affected user extension	24		C	see note 2
Delivery to affected user(s)	1	1	M	see note 3
Acknowledgement from affected user(s)	1	1	M	see note 3
Definition type	2	1	M	
Number of services	3	1	M	see note 8
Service	3		C	see note 9
Range type for closed user groups	4		C	see notes 4 and 5
Closed user group identifier	24		C	see note 6
Closed user group identifier extension present	1		C	see note 6
Closed user group identifier extension	24		C	see note 7
Range type for restricted identities	4		C	see notes 4 and 10
Restricted SSI	24		C	see note 11
Restricted extension present	1		C	see note 11
Restricted extension	24		C	see note 12
Range type for exceptions to restricted identities	4		C	see notes 4 and 13
Exception to restricted SSI	24		C	see note 14
Exception to restricted extension present	1		C	see note 14
Exception to restricted extension	24		C	see note 15
NOTE 1: The information element shall be present as many times as indicated by the range type for affected user information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 2: The presence of the information element shall be conditional on the affected user extension present information element.				
NOTE 3: An acknowledgement from affected user(s) may be requested only when a delivery to the affected user(s) is also requested.				
NOTE 4: The information element shall be conditional on the information element definition type: - for addition and replacement the information element shall be present; - for removal: element shall not be present.				
NOTE 5: The closed user groups information element defines those groups for which the restriction does not apply (calls from those groups are allowed).				
NOTE 6: The information element shall appear as many times as defined by the range type for closed user groups information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 7: The information element shall be conditional on the closed user group identifier extension present information element.				
NOTE 8: The service information element defines those services for which the definition type applies.				
NOTE 9: The information element shall be present as many times as defined by the number of services information element.				
NOTE 10: The restricted identities information element defines those users for which the restriction applies.				
NOTE 11: The information element shall be present as many times as defined by the range type for restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 12: The information element shall be conditional on the restricted extension present information element.				
NOTE 13: The exception to restricted identity information element defines those identities for which the restriction does not apply (calls from those identities are allowed).				
NOTE 14: The information element shall be present as many times as defined by the range type for exceptions to restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 15: The information element shall be conditional on the exception to restricted extension present information element.				

5.3.1.2 DEFINE ACK PDU

The DEFINE ACK PDU may be offered from the SS-BIC restricted user home SwMI to the authorized user MS/LS. The DEFINE ACK PDU shall have the format as shown in table 11. SwMI may generate multiple DEFINE ACK PDUs due to a single DEFINE PDU, if the definition results are different for different affected parties.

NOTE: The DEFINE ACK PDU is used as the response to DEFINE and DEFINE EXTERNAL PDUs.

Table 11: DEFINE ACK PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	DEFINE ACK
Range type for affected user identities	4	1	M	
Affected user SSI	24	1	M	see note 1
Affected user extension present	1	1	M	see note 1
Affected user extension	24		C	see note 2
Definition result	3	1	M	
NOTE 1: The information element shall be present as many times as indicated by the range type for subscriber identities information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 2: The information element shall be conditional on the affected user extension present information element.				

5.3.1.3 DEFINE EXTERNAL PDU

The DEFINE EXTERNAL PDU may be offered from the authorized user MS/LS to the SS-BIC affected user home SwMI. The DEFINE EXTERNAL PDU is similar to the regular DEFINE; the differences lie in the address string which define the external numbers from which originating calls shall be barred. The DEFINE EXTERNAL PDU shall have the format as shown in table 12.

Table 12: DEFINE EXTERNAL PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	DEFINE EXTERNAL
Range type for affected user identities	4	1	M	
Affected user SI	24	1	M	see note 1
Affected user extension present	1	1	M	
Affected user extension	24		C	see note 2
Delivery to affected user(s)	1	1	M	see note 3
Acknowledgement from affected user(s)	1	1	M	see note 3
Definition type	2	1	M	
Number of services	3	1	M	see note 8
Service			C	see note 9
Range type for closed user groups	4		C	see notes 4 and 5
Closed user group identifier	24		C	see note 6
Closed user group identifier extension present	1		C	see note 6
Closed user group identifier extension	24		C	see note 7
Range type for restricted external numbers	4		C	see notes 4 and 10
Restricted external number length indicator	5		C	see note 11
Restricted external number	variable		C	see note 12
Range type for exceptions to restricted external numbers	4		C	see notes 4 and 13
Exception to restricted external number length indicator	5		C	see note 14
Exception to restricted external number	variable		C	see note 15
NOTE 1: The information element shall be present as many times as indicated by the range type for affected user information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 2: The presence of the information element shall be conditional on the affected user extension present information element.				
NOTE 3: An acknowledgement from affected user(s) may be requested only when a delivery to the affected user(s) is also requested.				
NOTE 4: The information element shall be conditional on the information element definition type: - for addition and replacement the information element shall be present; - for removal: the information element shall not be present.				
NOTE 5: The closed user groups information element defines those groups for which the restriction does not apply (calls from those groups are allowed. This information element has a meaning only if the external numbers are used in the definition of the closed user group members).				
NOTE 6: The information element shall appear as many times as defined by the range type for closed user groups information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 7: The information element shall be conditional on the closed user group identifier extension present information element.				
NOTE 8: The service information element defines those services for which the definition type applies.				
NOTE 9: The information element shall be present as many times as defined by the number of services information element.				
NOTE 10: The restricted external numbers information element defines those numbers for which the restriction applies.				
NOTE 11: The information element shall be present as many times as defined by the range type for restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 12: The information element shall be conditional on the restricted external number length indicator information element.				
NOTE 13: The exceptions to restricted external number information element define those numbers for which the restriction does not apply (calls from those numbers are allowed).				
NOTE 14: The information element shall be present as many times as defined by the range type for exceptions to restricted external number information element.				
NOTE 15: The information element shall be conditional on the exception to restricted external number length indicator information element.				

5.3.1.4 DEFINE USER PDU

The DEFINE USER PDU may be offered from the affected user SwMI to the affected user MS/LS. The DEFINE USER PDU shall have the format as shown in table 13.

Table 13: DEFINE USER PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	DEFINE USER
Acknowledgement from affected user	1	1	M	
Definition type	2	1	M	
Number of services	3	1	M	see note 5
Service	3		C	see note 6
Range type for closed user groups	4		C	see notes 1 and 2
Closed user group identifier	24		C	see note 3
Closed user group identifier extension present	1		C	see note 3
Closed user group identifier extension	24		C	see note 4
Range type for restricted identities	4		C	see notes 1 and 7
Restricted SSI	24		C	see note 8
Restricted extension present	1		C	see note 8
Restricted extension	24		C	see note 9
Range type for exceptions to restricted identities	4		C	see notes 1 and 10
Exception to restricted SSI	24		C	see note 11
Exception to restricted extension present	1		C	see note 11
Exception to restricted extension	24		C	see note 12
<p>NOTE 1: The information element shall be conditional on the information element definition type:</p> <ul style="list-style-type: none"> - for addition and replacement the information element shall be present; - for removal the information element shall not be present. <p>NOTE 2: The closed user groups information element defines those groups for which the restriction does not apply (calls to those groups are allowed).</p> <p>NOTE 3: The information element shall appear as many times as defined by the range type for closed user groups information element, refer to EN 300 392-9 [5], clause 8.3.1.</p> <p>NOTE 4: The information element shall be conditional on the closed user group identifier extension present information element.</p> <p>NOTE 5: The service information element defines those services for which the definition type applies.</p> <p>NOTE 6: The information element shall be present as many times as defined by the number of services information element.</p> <p>NOTE 7: The restricted identities information element defines those users for which the restriction applies.</p> <p>NOTE 8: The information element shall be present as many times as defined by the range type for restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.</p> <p>NOTE 9: The information element shall be conditional on the restricted extension present information element.</p> <p>NOTE 10: The exception to restricted identity information element defines those identities for which the restriction does not apply (calls to those identities are allowed).</p> <p>NOTE 11: The information element shall be present as many times as defined by the range type for exceptions to restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.</p> <p>NOTE 12: The information element shall be conditional on the exception to restricted extension present information element.</p>				

5.3.1.5 DEFINE USER ACK PDU

The DEFINE USER ACK PDU may be offered from the affected user to the affected user SwMI. The DEFINE USER ACK PDU shall have the format as shown in table 14.

NOTE: This PDU is a response to DEFINE USER and DEFINE EXTERNAL USER PDUs.

Table 14: DEFINE USER ACK PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	DEFINE USER ACK
Distribution result	3	1	M	

5.3.1.6 DEFINE USER EXTERNAL PDU

The DEFINE USER EXTERNAL PDU may be offered from the affected user SwMI to the affected user MS/LS. The DEFINE USER EXTERNAL PDU shall have the format as shown in table 15.

Table 15: DEFINE USER EXTERNAL PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	DEFINE USER EXTERNAL
Acknowledgement from affected user	1	1	M	
Definition type	2	1	M	
Number of services	3	1	M	see note 5
Service	3		C	see note 6
Range type for closed user groups	4		C	see notes 1 and 2
Closed user group identifier	24		C	see note 3
Closed user group identifier extension present	1		C	see note 3
Closed user group identifier extension	24		C	see note 4
Range type for restricted external numbers	4		C	see notes 1 and 7
Restricted external number length indicator	5		C	see note 8
Restricted external number	variable		C	see note 9
Range type for exceptions to restricted external numbers	4		C	see notes 1 and 10
Exception to restricted external number length indicator	5		C	see note 11
Exception to restricted external number	variable		C	see note 12
<p>NOTE 1: The information element shall be conditional on the information element definition type: - for addition and replacement the information element shall be present; - for removal the information element shall not be present.</p> <p>NOTE 2: The closed user groups information element defines those groups for which the restriction does not apply (calls to those groups are allowed).</p> <p>NOTE 3: The information element shall appear as many times as defined by the range type for closed user groups information element, refer to EN 300 392-9 [5], clause 8.3.1.</p> <p>NOTE 4: The information element shall be conditional on the closed user group identifier extension present information element.</p> <p>NOTE 5: The service information element defines those services for which the definition type applies.</p> <p>NOTE 6: The information element shall be present as many times as defined by the number of services information element.</p> <p>NOTE 7: The restricted external numbers information element defines those numbers for which the restriction applies.</p> <p>NOTE 8: The information element shall be present as many times as defined by the range type for restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.</p> <p>NOTE 9: The information element shall be conditional on the restricted external number length indicator information element.</p> <p>NOTE 10: The exceptions to restricted external number information element define those numbers for which the restriction does not apply (calls from those numbers are allowed).</p> <p>NOTE 11: The information element shall be present as many times as defined by the range type for exceptions to restricted external number information element.</p> <p>NOTE 12: The information element shall be conditional on the exception to restricted external number length indicator information element.</p>				

5.3.1.7 INTERROGATE PDU

The INTERROGATE PDU may be sent from either affected user MS/LS or authorized user MS/LS to SS-BIC restricted user home SwMI. The INTERROGATE PDU shall have the following general format as shown in table 17.

NOTE: There may be multiple responses to a single INTERROGATE PDU interrogation type and number of affected users.

Table 16: INTERROGATE PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	INTERROGATE
Range type for affected user identities	4	1	M	
Affected user SSI	24		C	Repeatable, see note 1
Affected user extension present	1		C	see note 1
Affected user extension	24		C	see note 2
Interrogation type	1	1	M	
NOTE 1: The information element shall be present as many times as indicated by the range type for subscriber identities information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 2: The information element shall be conditional on the affected user extension present information element.				

5.3.1.8 INTERROGATE ACK PDU

The INTERROGATE ACK PDU may be sent from SS-BIC restricted user home SwMI to either affected user MS/LS or authorized user MS/LS. The INTERROGATE ACK PDU shall have the format as shown in table 18.

Table 17: INTERROGATE ACK PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	INTERROGATE ACK
Range type for affected user identities	4	1	M	
Affected user SSI	24		C	see note 1
Affected user extension present	1		C	see note 1
Affected user extension	24		C	see note 2
Interrogation result	3	1	M	
Delivery status to affected user(s)	2	1	M	
Number of services	3	1	M	see note 7
Service	3		C	see note 8
Range type for closed user groups	4		C	see notes 3 and 4
Closed user group identifier	24		C	see note 5
Closed user group identifier extension present	1		C	see note 5
Closed user group identifier extension	24		C	see note 6
Range type for restricted identities	4		C	see notes 9 and 10
Restricted SSI	24		C	see note 11
Restricted extension present	1		C	see note 11
Restricted extension	24		C	see note 12
Range type for exceptions to restricted identities	4		C	see notes 9 and 13
Exception to restricted SSI	24		C	see note 14
Exception to restricted extension present	1		C	see note 14
Exception to restricted extension	24		C	see note 15
Range type for restricted external numbers	4		C	see notes 16 and 17
Restricted external number length indicator	5		C	see note 18
Restricted external number	variable		C	see note 19
Range type for exceptions to restricted external numbers	4		C	see notes 16 and 20
Exception to restricted external number length indicator	5		C	see note 21
Exception to restricted external number	variable		C	see note 22
NOTE 1: The information element shall be present as many times as indicated by the range type for affected user information element, refer to EN 300 392-9 [5], clause 8.3.1.				
NOTE 2: The presence of the information element shall be conditional on the affected user extension present information element.				
NOTE 3: This information element shall be conditional on the element Interrogation result:				
- accepted TETRA identities provided: information element shall be present;				
- accepted, external numbers provided: the information element shall be present;				
- any other value: information element shall not be present.				
NOTE 4: The closed user groups information element defines those groups for which the restriction does not apply.				

NOTE 5:	The information element shall appear as many times as defined by the range type for closed user groups information element, refer to EN 300 392-9 [5], clause 8.3.1.
NOTE 6:	The information element shall be conditional on the closed user group identifier extension present information element.
NOTE 7:	The service information element defines those services for which the interrogation result applies.
NOTE 8:	The information element shall be present as many times as defined by the number of services information element.
NOTE 9:	This information element shall be conditional on the element Interrogation result: <ul style="list-style-type: none"> - accepted TETRA identities provided: information element shall be present; - any other value: information element shall not be present.
NOTE 10:	The restricted identities information element defines those numbers for which the restriction applies.
NOTE 11:	The information element shall be present as many times as defined by the range type for restricted identities information element, refer to EN 300 392-9 [5], clause 8.3.1.
NOTE 12:	The information element shall be conditional on the restricted extension present information element.
NOTE 13:	The exceptions to restricted identities information element define those numbers for which the restriction does not apply (calls from those numbers are allowed).
NOTE 14:	The information element shall be present as many times as defined by the range type for exceptions to restricted identities information element.
NOTE 15:	The information element shall be conditional on the exception to restricted extension information element.
NOTE 16:	This information element shall be conditional on the element interrogation result: <ul style="list-style-type: none"> - accepted, external numbers provided: the information element shall be present; - any other value: the information element shall not be present.
NOTE 17:	The restricted external numbers information element defines those numbers for which the restriction applies.
NOTE 18:	The information element shall be present as many times as defined by the range type for restricted external numbers information element, refer to EN 300 392-9 [5], clause 8.3.1.
NOTE 19:	The information element shall be conditional on the restricted external number length indicator information element.
NOTE 20:	The exceptions to restricted external number information element define those numbers for which the restriction does not apply (calls from those numbers are allowed).
NOTE 21:	The information element shall be present as many times as defined by the range type for exceptions to restricted external number information element.
NOTE 22:	The information element shall be conditional on the exception to restricted external number length indicator information element.

5.3.1.9 CALL BARRED PDU

The CALL BARRED PDU may be offered from calling user SwMI to calling user MS/LS. The CALL BARRED PDU shall have the format as shown in table 19:

Table 18: CALL BARRED PDU contents

Element	Length	Type	C/O/M	Remark
SS-Type	6	1	M	Refer EN 300 392-9 [5]
BIC PDU type	5	1	M	CALL BARRED
Rejection cause	2	1	M	

NOTE 1: If presentation of the rejection cause is not important or SwMI can assume that the calling user MS/LS does not support SS-BIC functional entity FE5, then still the Notification indicator can be used, refer to clause 5.3.1.10.

NOTE 2: The CALL BARRED PDU is not applicable to the SDS and informing of the sending user is outside the scope of the present document.

5.3.1.10 Notification indicator

The notification indicator information element in the call disconnection D-RELEASE PDU may be used instead or in addition to the CALL BARRED PDU to indicate call barring. In that case the notification indicator shall be set to "Call barred by SS-BIC", refer to EN 300 392-9 [5], clause 7.2.2, table 3.

5.3.2 TETRA PDU Information Element Coding

5.3.2.1 Acknowledgement from affected user(s)

The acknowledgement from affected user(s) information element shall have values as defined in table 20.

Table 19: Acknowledgement from affected user(s) information element contents

Information element	Length	Value	Remark
Acknowledgement from affected user(s)	1	0 ₂	Acknowledgement not requested
		1 ₂	Acknowledgement requested

5.3.2.2 Affected user extension

The affected user extension information element shall define the extension part of the TSI as presented in table 21.

Table 20: Subscriber identity information element contents

Element	Length	Value	Remark
MCC and MNC	24	any	See ETS 300 392-1 [2], clause 7

5.3.2.3 Affected user extension present

The affected user extension present information element shall indicate the presence of the affected user extension information element as defined in table 22.

Table 21: Affected user extension present information element contents

Information element	Length	Value	Remark
Affected user extension present	1	0	Not present
		1	Present

5.3.2.4 Affected user SSI

The affected user SSI information element shall define the SSI part of the TSI as presented in table 23.

Table 22: Affected user SSI information element contents

Element	Length	Value	Remark
SSI	24	any	See ETS 300 392-1 [2], clause 7

5.3.2.5 BIC PDU type

BIC PDU type information element shall indicate the type of the SS-BIC action as described in table 24.

Table 23: BIC PDU type information element contents

Information element	Length	Value	Remark
BIC PDU type	4	0000 ₂	Refer EN 300 392-9 [5]
		0001 ₂	Refer EN 300 392-9 [5]
		0010 ₂	Refer EN 300 392-9 [5]
		0011 ₂	Refer EN 300 392-9 [5]
		0100 ₂	Refer EN 300 392-9 [5]
		0101 ₂	DEFINE
		0110 ₂	DEFINE ACK
		0111 ₂	DEFINE EXTERNAL
		1000 ₂	DEFINE USER
		1001 ₂	DEFINE USER ACK
		1010 ₂	DEFINE USER EXTERNAL
		1011 ₂	INTERROGATE
		1100 ₂	INTERROGATE ACK
		1101 ₂	CALL BARRED, see note
>1101 ₂	Reserved		
NOTE: This PDU may be replaced by the notification call barred due to SS-BIC.			

5.3.2.6 Closed user group identifier

Closed user group identifier information element shall identify a closed user group. It shall be composed of three information elements, the closed user group identifier SSI, the closed user group identifier extension present and the closed user group identifier extension. The information element encoding shall be as given in tables 25, 26 and 27.

NOTE: Although the format of the Closed user group identifier is the same as for GTSI it is logically an independent identifier not linked or limited to the GTSIs. Its effective (SSI) size may be limited to say 16 bits but the information element length is 24 bits.

Table 24: Closed user group identifier information element contents

Information element	Length	Value	Remark
Closed user group identifier	24	any	

Table 25: Closed user group extension present information element contents

Information element	Length	Value	Remark
Closed user group identifier extension present	1	0	Not present
		1	Present

Table 26: Closed user group identifier extension information element contents

Information element	Length	Value	Remark
Closed user group identifier extension	24	any	

5.3.2.7 Definition result

Definition result information element shall indicate whether the previously made definition request was successful or unsuccessful. Definition result information element shall be as described in table 28.

Table 27: Definition result information element contents

Information element	Length	Value	Remark
Definition result	3	000 ₂	Request failed for any reason
		001 ₂	Accepted 1
		010 ₂	Accepted, but definition values changed by SwMI,
		011 ₂	User not authorized
		100 ₂	Unknown TETRA identity, see note 2
		101 ₂	Reserved
		110 ₂	Parameters not valid, see note 3
		111 ₂	Insufficient information
NOTE 1: Further details how definition values are changes may be available by interrogation.			
NOTE 2: Applicable to the restricted party information element.			
NOTE 3: Applicable to all other information elements than the restricted party information element.			

5.3.2.8 Definition type

Definition type information element shall indicate the type of the definition in relation to possible existing SS-BIC definition for the given subscriber identity or identities and service or services:

- addition shall complement a previous definition, if any;
- replacement shall replace a previous definition, if any;
- removal shall remove an existing definition, if any.

The information element shall be encoded as defined in table 29.

Table 28: Definition type information element contents

Information Element	Length	Value	Remarks
Definition type	2	00 ₂	Addition
		01 ₂	Replacement
		10 ₂	Removal
		11 ₂	Reserved

5.3.2.9 Delivery status to affected user(s)

The delivery status to affecter user(s) shall indicate the status of the delivery as defined in table 30.

Table 29: Delivery status to affected user(s) information element contents

Information element	Length	Value	Remark
Delivery status to affected user(s)	2	00 ₂	Delivery not requested
		01 ₂	Definition sending to the affected user(s) pending in the SwMI
		10 ₂	Acknowledgement received from affected user(s)
		11 ₂	Delivery status unknown

5.3.2.10 Delivery to affected user(s)

Delivery to affected user(s) information element shall have values as defined in table 31.

Table 30: Delivery to affected user(s)) information element contents

Information element	Length	Value	Remark
Delivery to affected user(s)	1	0 ₂	Delivery not requested
		1 ₂	Delivery requested

5.3.2.11 Distribution result

Distribution result information element shall indicate whether the previously made distribution of definitions to affected user was successful or unsuccessful. Distribution result element is described in table 32.

Table 31: Distribution result information element contents

Information element	Length	Value	Remark
Distribution result	3	000 ₂	Request failed for any reason
		001 ₂	Successfully received by MS/LS
		010 ₂	Reserved
		011 ₂	Reserved
		100 ₂	Reserved
		101 ₂	Reserved
		110 ₂	Parameters not valid
		111 ₂	Insufficient information

5.3.2.12 Exception to restricted extension

The exception to restricted extension information element shall define the extension part of the TSI as presented in table 33.

Table 32: Exception to restricted extension information element contents

Element	Length	Value	Remark
MCC and MNC	24	any	See ETS 300 392-1 [2], clause 7

5.3.2.13 Exception to restricted extension present

The exception to restricted extension present information element shall indicate the presence of the affected user extension information element as defined in table 34.

Table 33: Exception to restricted extension present information element contents

Information element	Length	Value	Remark
Exception to restricted extension present	1	0	Not present
		1	Present

5.3.2.14 Exception to restricted external number

The exception to restricted external number information element shall be encoded as a string of decimal encoded digits defined in EN 300 392-9 [5], clause 8.4.3, table 19 "Number of external subscriber number digits".

5.3.2.15 Exception to restricted external number length indicator

The exception to restricted external number length indicator shall be encoded as defined in EN 300 392-9 [5], clause 8.4.3, table 19 "Number of external subscriber number digits".

5.3.2.16 Exception to restricted SSI

The exception to restricted SSI information element shall define the SSI part of the TSI as presented in table 35.

Table 34: Exception to restricted SSI information element contents

Element	Length	Value	Remark
SSI	24	any	See ETS 300 392-1 [2], clause 7

5.3.2.17 Interrogation result

Interrogation result information element shall indicate whether the previously made interrogation request was successful or unsuccessful. Interrogation result element is described in table 36.

Table 35: Interrogation result information element contents

Element	Length	Value	Remark
Interrogation result	3	000 ₂	Request failed for any reason
		001 ₂	Accepted, TETRA identities provided
		010 ₂	Accepted, external numbers provided
		011 ₂	User not authorized
		100 ₂	Unknown affected user identity
		101 ₂	Reserved
		110 ₂	Parameters not valid
		111 ₂	Insufficient information
NOTE: The result is also applicable for affected users.			

5.3.2.18 Interrogation type

The interrogation type information element shall indicate the type of interrogation as defined in table 37.

Table 36: Interrogation type information element contents

Information element	Length	Value	Remark
Interrogation type	2	00 ₂	Reserved
		01 ₂	Interrogate restricted TETRA identities
		10 ₂	Interrogate restricted external subscriber numbers
		11 ₂	Interrogate restricted TETRA identities and external subscriber numbers

5.3.2.19 Number of service(s)

The number of services information element shall indicate how many service elements are present and follow this information element in the PDU. Number of services information element shall be as defined in table 38.

Table 37: Number of service(s) contents

Element	Length	Value	Remarks
Number of services	3	000 ₂	Reserved, see note 1
		001 ₂	One service
		010 ₂	Two services
		etc.	Etc.
		111 ₂	Seven services, see note 2
NOTE 1: At least one service is defined in all PDUs.			
NOTE 2: The number of services value is limited by the number of different services as defined in table 43.			

5.3.2.20 Range type for affected user identities

The range type for affected user identities information element shall be encoded as defined in the EN 300 392-9 [5], clause 8.3.1.

5.3.2.21 Range type for closed user groups

The range type for closed user groups information element shall be encoded as defined in the EN 300 392-9 [5], clause 8.3.1.

5.3.2.22 Range type for exceptions to restricted external numbers

The range type for exceptions to restricted external numbers information element shall be encoded as defined in the EN 300 392-9 [5], clause 8.3.1.

5.3.2.23 Range type for restricted external numbers

The range type for restricted external numbers information element shall be encoded as defined in the EN 300 392-9 [5], clause 8.3.1.

5.3.2.24 Range type for restricted identities

The range type for restricted identities information element shall be encoded as defined in the EN 300 392-9 [5], clause 8.3.1.

5.3.2.25 Rejection cause

The rejection cause information element shall indicate the reason for the barring as described in table 39.

Table 38: Rejection cause information element contents

Element	Length	Value	Remarks
Rejection cause	2	00 ₂	Called party outside allowed user group
		01 ₂	Restricted service type
		10 ₂	Restricted destination address
		11 ₂	Reserved

5.3.2.26 Restricted extension

The restricted extension information element shall define the extension part of the TSI as presented in table 40.

Table 39: Restricted extension information element contents

Element	Length	Value	Remark
MCC and MNC	24	any	See ETS 300 392-1 [2], clause 7

5.3.2.27 Restricted extension present

The RESTRICTED extension present information element shall indicate the presence of the affected user extension information element as defined in table 41.

Table 40: Restricted extension present information element contents

Information element	Length	Value	Remark
Restricted extension present	1	0	Not present
		1	Present

5.3.2.28 Restricted external number

The restricted external number information element shall be encoded as a string of decimal encoded digits defined in EN 300 392-9 [5], clause 8.4.3.

5.3.2.29 Restricted external number length indicator

The restricted external number length indicator information element shall indicate how many digits there are in the restricted external number as defined in EN 300 392-9 [5], clause 8.4.3, table 19 "Number of external subscriber number digits".

5.3.2.30 Restricted SSI

The restricted SSI information element shall define the SSI part of the TSI as presented in table 42.

Table 41: restricted SSI information element contents

Element	Length	Value	Remark
SSI	24	any	See ETS 300 392-1 [2], clause 7

5.3.2.31 Service

Service information element shall identify the circuit mode and/or SDS mode data service for which the definition is applicable as described in table 43.

Table 42: Service information element contents

Element	Length	Value	Remarks
Service	3	000 ₂	All applicable services, see note
		001 ₂	Circuit mode speech service
		010 ₂	Circuit mode data service
		011 ₂	Short Data Service (SDS)
		100 ₂	Reserved
		101 ₂	Reserved
		110 ₂	Reserved
		111 ₂	Reserved
NOTE: All applicable services correspond to all services listed in this table.			

5.3.3 Additional coding requirements over the ISI

Clauses 9, 10 and 11 of EN 300 392-9 [5] shall apply.

The remote operations (RO) protocol is defined in ITU-T Recommendations X.219 [10] and X.229 [11]. The generic procedures defined in this Standard provide an encoding mechanism for the transport and use of this RO protocol in the PISN environment for the provision of supplementary services or additional network features.

In the OSI environment, communication between application processes is represented in terms of communication between a pair of application entities (AEs). Communication between application entities is inherently interactive. Typically, one entity requests that a particular operation be performed; the other entity attempts to perform the operation and then reports the outcome of the attempts. The concept of Remote Operations is a vehicle for supporting interactive applications of this type.

The generic structure of an operation is an elementary request/reply interaction. Operations are carried out within the context of an application-association.

Figure 2 models this view.

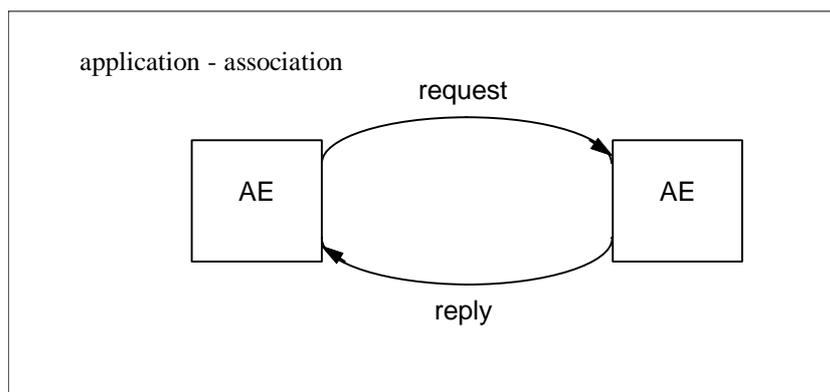


Figure 1: Remote Operations Model

Operations invoked by one AE (the invoker) are performed by the other AE (the performer). Operations may be classified according to whether the performer of an operation is expected to report its outcome:

- in the case of success or failure (a result reply is returned if the operation is successful, an error reply is returned if the operation is unsuccessful);

- in case of failure only (no reply is returned if the operation is successful, an error reply is returned if the operation is unsuccessful);
- in case of success only (a result reply is returned if the operation is successful, no reply is returned if the operation is unsuccessful); or
- not at all (neither a result nor an error reply is returned, whether the operation was successful or not).

Operations may also be classified according to two possible operation modes: synchronous, in which the invoker requires a reply from the performer before invoking another operation; and asynchronous, in which the invoker may continue to invoke further operations without awaiting a reply.

The following Operation Classes are defined:

Operation Class 1:	Synchronous, reporting success or failure (result or error).
Operation Class 2:	Asynchronous, reporting success or failure (result or error).
Operation Class 3:	Asynchronous, reporting failure (error) only, if any.
Operation Class 4:	Asynchronous, reporting success (result) only.
Operation Class 5:	Asynchronous, outcome not reported.

The Operation Class of each operation is agreed to be Operation Class 3 between application entities for this SS-BIC Application Protocol draft ETS.

An application association defines the relationship between a pair of AEs, and is formed by the exchange of application (in this case supplementary services) Protocol Control information through the use of the services of underlying layers. The AE that initiates an association is called the association initiating AE, or the association initiator, while the AE that responds to the initiation of an application association by another AE is called the association responding AE, or the association responder.

NOTE 1: In the application of ROSE for the support of supplementary services in PSS1 the underlying services used by ROSE are those provided by GFT-Control or those provided by the Association Control Service Entity (ACSE). No use is made of the services of the Reliable Transport Service Element (RTSE).

Application associations are classified by which application-entity is allowed to invoke operations:

Association Class 1:	Only the association-initiating application-entity can invoke operations.
Association Class 2:	Only the association-responding application-entity can invoke operations.
Association Class 3:	Both the association-initiating and the association-responding application-entities can invoke operations.

The present document assumes Application associations of Association Class 1.

The explicit control of an application-association (establishment, release and abort) is performed by the Association Control Service Element (ACSE) defined in ITU-T Recommendation X.217 [12].

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

In the case of information flows such as DEFINE request which expect a reply DEFINE ACK response, the TETRA PDU such as DEFINE request shall be encoded in the IsiArgument tetraMessage IMPLICIT OCTET STRING of the ROSE Invoke APDU in support of TETRA encoding PDU from as defined in clause 8.4.1 of ETS 300 392-3-1 [8]. The expected information flow DEFINE ACK TETRA PDU shall be encoded in the IsiArgument tetraMessage IMPLICIT OCTET STRING of another ROSE Invoke APDU (in the opposite direction) defined in the same clause.

In the case of unconfirmed information flows such as CALL BARRED indication, the TETRA PDU such as CALL BARRED shall be encoded in the IsiArgument tetraMessage IMPLICIT OCTET STRING of the ROSE Invoke APDU in support of TETRA encoding PDU as defined in clause 8.4.1 of ETS 300 392-3-1 [8].

NOTE 2: The actions resulting from reception of ERRORS in reply to the ROSE Invoke APDU such as retry, time-out are outside the scope of the present document.

5.4 SS-BIC State Definitions

5.4.1 State at the calling user MS/LS

No modification to the basic call state.

5.4.2 State at the calling user SwMI

SS-BIC Idle.

5.4.3 State at the affected user MS/LS

SS-BIC Idle.

5.4.4 State at the affected user SwMI

SS-BIC Idle.

5.4.5 State at the authorized user MS/LS

SS-BIC Idle.

5.4.6 State at the SS-BIC restricted user home SwMI

SS-BIC Idle.

5.5 SS-BIC Signalling Procedures

5.5.1 Actions at Calling User MS/LS

The actions at calling user MS/LS are shown in the SDL diagram of clause A.1. The actions at calling user A MS/LS are those related to normal basic call; calling user A MS/LS shall also be able to receive a notification "Call barred by SS-BIC" as specified in EN 300 392-9 [5] and may receive CALL BARRED PDU.

NOTE 1: It is assumed that this calling user is not one of the SS-BIC authorized users; in the case where calling user is also SS-BIC authorized user refer to clauses below.

NOTE 2: SS-SNA may be used to originate that call.

5.5.2 Actions at Calling User SwMI

The actions at calling user SwMI are shown in the SDL diagram of clause A.2. Besides the actions related to normal basic call, calling user SwMI may receive from SS-BIC affected user home SwMI a CALL BARRED PDU and should receive a notification ""Call barred by SS-BIC" as specified in EN 300 392-9 [5]. Upon receipt of this CALL BARRED PDU and/or the notification, the calling user A SwMI shall present to calling user A MS/LS the "Call barred by SS-BIC" notification in the basic call disconnection with reason "SS-specific disconnection" and may present the CALL BARRED PDU.

5.5.3 Actions at the authorized user MS/LS

The SDL representation of procedures at the authorized user MS/LS is shown in clause A.3.

5.5.3.1 Normal procedures at the authorized user MS/LS

The authorized user MS/LS shall send DEFINE/DEFINE EXTERNAL or INTERROGATE PDU for SS-BIC in a U-FACILITY PDU in filling in the appropriate value for the routeing information element (see table 4 of EN 300 392-9 [5]). This value shall correspond:

- usually, to the SS-BIC restricted user home SwMI.

In accordance with clause 8.4.1 of EN 300 392-9 [5], identities included in DEFINE/DEFINE EXTERNAL or INTERROGATE PDUs may be indicated using only their SSIs in the case where the corresponding MNI is that of the SwMI to which those PDUs are addressed.

NOTE: It is assumed that the specification of the DEFINE/DEFINE EXTERNAL or INTERROGATE PDUs for SS-BIC does not provide the possibility to indicate such identities using SNAs.

The authorized user MS/LS may receive one or more DEFINE ACK/DEFINE EXTERNAL ACK or INTERROGATE ACK PDUs for SS-BIC in a D-FACILITY PDU.

In accordance with clause 8.4.1 of EN 300 392-9 [5], the authorized user MS/LS shall complement any identities indicated using only their SSIs which have been included in any received DEFINE ACK/DEFINE EXTERNAL ACK or INTERROGATE ACK PDU.

5.5.3.2 Exceptional procedures at the authorized user MS/LS

Clause 11.2 of EN 300 392-9 [5] shall apply for the exceptional procedures at the authorized user MS/LS.

5.5.4 Actions at the SS-BIC control entity at the SwMI where the authorized user is registered

The SDL representation of procedures at the supplementary service control entity at the SwMI where the authorized user is registered is shown in clause A.4.

5.5.4.1 Normal procedures at the SS-BIC control entity at the SwMI where the authorized user is registered

The SS-BIC control entity at the SwMI where the authorized user is registered shall:

- receive the U-FACILITY PDU containing a DEFINE/DEFINE EXTERNAL PDU or an INTERROGATE PDU, and route them according to the value of the routeing information element in the U-FACILITY PDU (see table 4 of EN 300 392-9 [5]). This routeing shall be as defined in clause 9.1 of EN 300 392-9 [5];
- if the SwMI where the authorized user is registered coincides with the SS-BIC restricted user home SwMI, its SS-BIC control entity shall process the DEFINE/DEFINE EXTERNAL or INTERROGATE PDU. Notably, in accordance with clause 8.4.1 of EN 300 392-9 [5], the SwMI shall then complement any identities indicated using only their SSIs which have been included in that PDU;
- if the SwMI where the authorized user is registered does not coincide with the SS-BIC restricted user home SwMI, clause 9.1 of EN 300 392-9 [5] shall apply to route the DEFINE/DEFINE EXTERNAL and INTERROGATE PDU(s) over the ISI. Notably the identity of the authorized user will be added to the corresponding ANF-ISISS PDU (see table 24 of EN 300 392-9 [5]).

In addition only the following options shall apply for the PSS1 facility information element carrying this ANF-ISISS PDU (as a ROSE Invoke APDU):

- both the sourceEntity and the destinationEntity data elements in the Network Facility Extension (NFE) of this PSS1 facility information element shall contain the value endPINX (see clause 10.3.1 of EN 300 392-9 [5]);
- no interpretation APDU shall be included in this PSS1 facility information element (see clause 10.3.3 of EN 300 392-9 [5]);
- if the resulting DEFINE ACK/DEFINE EXTERNAL ACK or INTERROGATE ACK PDU(s) is (are) sent, the SS-BIC control entity at the SwMI where the authorized user is registered shall receive the corresponding ANF-ISISS ROSE Invoke APDU;

- the DEFINE ACK/DEFINE EXTERNAL ACK and INTERROGATE ACK PDU resulting from an authorized user request shall be sent to the authorized user MS/LS in a D-FACILITY PDU.

In addition, the SS-BIC affected user home SwMI shall, if requested according to the content of the information element "delivery to affected user" in the DEFINE PDU received from the authorized user, send to the affected (called/barrred) user, the DEFINE USER/DEFINE EXTERNAL USER PDU to inform the affected user MS/LS that it is subject to call barring due to definition of SS-BIC against its ITSI. The SS-BIC restricted user home SwMI shall expect a DEFINE USER ACK PDU, on option, if so requested in the DEFINE USER/DEFINE EXTERNAL USER PDU.

If the Acknowledgement from affected user(s) parameter is included in the DEFINE/DEFINE EXTERNAL PDU, SS-BIC restricted user home SwMI should start timer T1 and wait for DEFINE USER ACK.

If the definition is made to a group, the affected users shall be all the members of that group.

NOTE: As an operator option, the SS-BIC restricted user home SwMI may keep the definition requests in the SwMI if any of the affected user(s) is(are) not reachable and send them later, if one or more affected user(s) cannot be reached or has (have) not acknowledged the request.

5.5.4.2 Exceptional procedures at the SS-BIC control entity at the SwMI where the authorized user is registered

Clause 11 of EN 300 392-9 [5] shall apply for the exceptional procedures at the SS-BIC control entity at the SwMI where the authorized user is registered, taking into account the fact that the support of each of the PDUs: DEFINE/DEFINE EXTERNAL and INTERROGATE is optional.

The information defined in clause 11.2 of EN 300 392-9 [5] shall be sent to the authorized user MS/LS in a D-FACILITY PDU. Such D-FACILITY PDU shall be individually addressed.

If the Acknowledgement from affected user(s) parameter is set to "Acknowledgement requested" in the DEFINE USER PDU, SwMI should start timer T1.

NOTE: No particular action is defined in the case where the affected user does not reply to the DEFINE USER request PDU sent by the SS-BIC restricted user home SwMI.

5.5.5 Actions at the SS-BIC restricted user home SwMI

The SDL representation of procedures at the SS-BIC control entity at the SS-BIS restricted user home SwMI is shown in clause A.5.

5.5.5.1 Normal procedures

The SS-BIC restricted user home SwMI shall:

- extract the DEFINE/DEFINE EXTERNAL or/and INTERROGATE PDU(s) in the received ANF-ISISS ROSE Invoke APDUs specified in clause 10 of EN 300 392-9 [5];
- process these PDUs. Notably, in accordance with clause 8.4.1 of EN 300 392-9 [5], the SwMI shall then complement any identities indicated using only their SSIs which have been included in such PDU(s). If the response to a DEFINE/DEFINE EXTERNAL or INTERROGATE PDU is positive, the SwMI shall generate the corresponding DEFINE ACK or INTERROGATE ACK PDU, respectively;
- it shall send such ACK PDU(s) according to clause 9.2 of EN 300 392-9 [5]. Notably the identity of the authorized user will be added to the DEFINE ACK or INTERROGATE ACK PDU(s) as its(their) final destination in the corresponding ANF-ISISS PDU (see table 4 of EN 300 392-9 [5]).

In addition only the following options shall apply for the PSS1 facility information element carrying this ANF-ISISS PDU (as a ROSE Invoke APDU):

- both the sourceEntity and the destinationEntity data elements in the Network Facility Extension (NFE) of this PSS1 facility information element shall contain the value endPINX (see clause 10.3.1 of EN 300 392-9 [5]);
- no interpretation APDU shall be included in this PSS1 facility information element (see clause 10.3.3 of EN 300 392-9 [5]).

NOTE 1: Either the authorized user or the affected user is only allowed to interrogate his own SS-BIC definitions and the definitions made for a group of which he is member.

SS-BIC restricted user home SwMI shall verify barring restrictions for any incoming call. The incoming service shall be barred:

- if all incoming services from outside a closed user group is barred, any services invoked by a party that does not belong to the group;

NOTE 2: The definition for the closed user group is outside the scope of the present document.

- if the requested service type is a restricted service, e.g. circuit mode data service;
- if the calling party address is within a restricted address string, and if there is not an exception string that overrides the barring.

NOTE 3: SS-BIC is not to be used to prevent certain individual subscribers from participating a group call at the call invocation or during a call; SS-BIC is used to prevent the invocation of an entire group call according to defined conditions. However, these conditions may prevent certain users from invoking the group call.

NOTE 4: Supplementary Service Call Diversion (SS-CD), ETS 300 392-10-1 [3], does not have any impact on the SS-BIC, and if the SS-BIC restrictions apply, a basic service request is barred. In other words, if SS-BIC has been defined either for the "original" or "diverted-to" called party and if the SS-BIC restrictions apply to the basic service requested to the "original" or "diverted-to" called party, respectively, the basic service is barred.

NOTE 5: Supplementary Service Call Authorized by Dispatcher (SS-CAD), ETS 300 392-10-6 [4], may be used to enable a dispatcher to allow a barred basic service to proceed.

In the case where the SS-BIC restricted user home SwMI receives an ISI-IC-SETUP as part of a normal basic call, the SS-BIC restricted user home SwMI shall determine if the calling user ITSI received corresponds to a call category to which incoming call barring applies with the proper basic service parameter. In that case, the SS-BIC restricted user home SwMI shall release the individual call through ISI to the calling user SwMI and shall send in a ISI-FACILITY element to the calling user SwMI containing the disconnect cause of the ISI-DISCONNECT "SS-specific disconnection" and notification set to "Call barred by SS-BIC".

The call setup to the SS-BIC restricted user home SwMI shall follow the ISI routing procedures which can lead to re-routing or forward switching; this ISI procedure includes the determination through each SwMI of the actual identification of the origin of the call.

In the case where the call setup is originated from a user belonging to a closed user group defined in the DEFINE/DEFINE EXTERNAL PDU, the CUG incoming call shall override any restrictions related to barring of incoming calls due to SS-BIC and shall proceed with the call.

In the case where the affected user is in a visited system different from his home SwMI, upon reception of a call or a connection service request from the calling user SwMI in the visited system, CC shall send the request to the home SwMI of the affected user as part of the normal call setup procedure. If this is the case, the home system should bar the service and indicate that to the CC in visited system, if CC in visited system does not have the SS-BIC definitions.

As part of the SS-BIC restricted user home SwMI function, the SwMI shall locate all the affected user(s); some affected users may be in a not reachable state.

5.5.5.2 Exceptional procedures at the SS-BIC control entity at the SS-BIC restricted user home SwMI

Clause 11.1 of EN 300 392-9 [5] shall apply for the exceptional procedures at the supplementary service control entity at the SS-BIC restricted user home SwMI, taking into account the fact that the support of each of the PDUs: DEFINE, DEFINE EXTERNAL and INTERROGATE is optional for every supplementary service.

5.5.6 Actions at the affected (called/barred) user SwMI

There are no particular actions related to SS-BIC to any of the affected user SwMI; normal basic call applies; affected user(s) to which calls are attempted and those calls are barred by SS-BIC are not informed of the basic call they are not receiving.

5.5.7 Actions at the affected (called/barred) user MS/LS

There are no particular actions related to SS-BIC to any of the affected user MS/LS; normal basic call applies; affected user(s) to which calls are attempted and those calls are barred by SS-BIC are not informed of the basic call they are not receiving.

5.6 Impact of Inter-working with Public ISDN

5.6.1 General

It shall not be possible to define/interrogate SS-BIC in the public ISDN from the TETRA gateway SwMI and it shall not be possible to define/interrogate SS-BIC within TETRA from the public ISDN.

It is assumed that inter-working does not apply to TETRA networks inter-working through public ISDN.

5.6.2 SS-BIC for Incoming Call from Public ISDN to TETRA

The TETRA gateway to ISDN SwMI shall play the role of the calling user SwMI of an internal call within TETRA; the TETRA ISDN gateway shall present either the ISI DISCONNECT or the ISI RELEASE it receives from the SS-BIC restricted user home SwMI to the public ISDN in either CALL DISCONNECT or CALL RELEASE.

5.6.3 SS-BIC for Incoming Call from TETRA to public ISDN

The TETRA gateway to ISDN SwMI shall play the role of the affected user SwMI and shall present to the public ISDN the ISI-SETUP it receives from the calling user SwMI in a CALL SETUP. The public ISDN will disconnect the call upon recognizing that SS-BIC has been invoked for that called user. The TETRA gateway SwMI shall recognize the DISCONNECT and shall send to the calling user SwMI an ISI-DISCONNECT with a disconnect cause "SS-specific disconnection" with notification set to "Call barred by SS-BIC".

5.7 Protocol interactions between SS-BIC and other supplementary services and ANFs

5.7.1 Protocol interactions between SS-BIC and other supplementary services

According to stage 1 description of SS-BIC ETS 300 392-10-19 [13], there are no protocol interactions between SS-BIC and other supplementary services. Stage 1 states either "not applicable" or "there shall be no interaction".

5.7.2 Protocol interactions between SS-BIC and ISI-IC-ANF

The SS-BIC may extend to several TETRA networks. The protocol interactions between SS-BIC and ISI-IC-ANF have been described in the normal procedure and the exceptional procedure of SS-BIC. The requirements for the inter-working over the ISI are summarized here:

- deliver and receive the SS-BIC definition and interrogation information over the ISI;
- barring of requested services within the SwMI based on the SS-BIC definitions received over the ISI;
- barring of services in the home SwMI and indicating this to the visited SwMI over the ISI;
- barring of services in the visited system when indicated by the home SwMI over the ISI;
- the capability to support the generic supplementary service functions over the ISI, refer EN 300 392-9 [5].

Annex A (normative): Specification and Description Language (SDL) representation of call related procedures

The diagrams in this annex use the Specification and Description Language defined in ITU-T Recommendation Z.100 [6].

Each diagram represents the behaviour of a supplementary service control entity either in a MS/LS or in an SwMI.

In accordance with the protocol model described in clause 14 of EN 300 392-2 [1], the supplementary service control entity at a MS/LS uses the services of the V+D air interface control. The same applies for the supplementary service control entity at the SwMI where the MS/LS is registered. If this SwMI or any other operates at the ISI, in accordance with the protocol model described in clause 8 of ETS 300 392-3-1 [8], their supplementary service control entities use, via the co-ordination function, the services of ANF-ISISS for the corresponding supplementary service ISI protocols.

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

The suffix PDU has been omitted after the PDU names (e.g. DEFINE or DEFINE ACK).

A.1 SDL representations of SS-BIC at calling user MS/LS

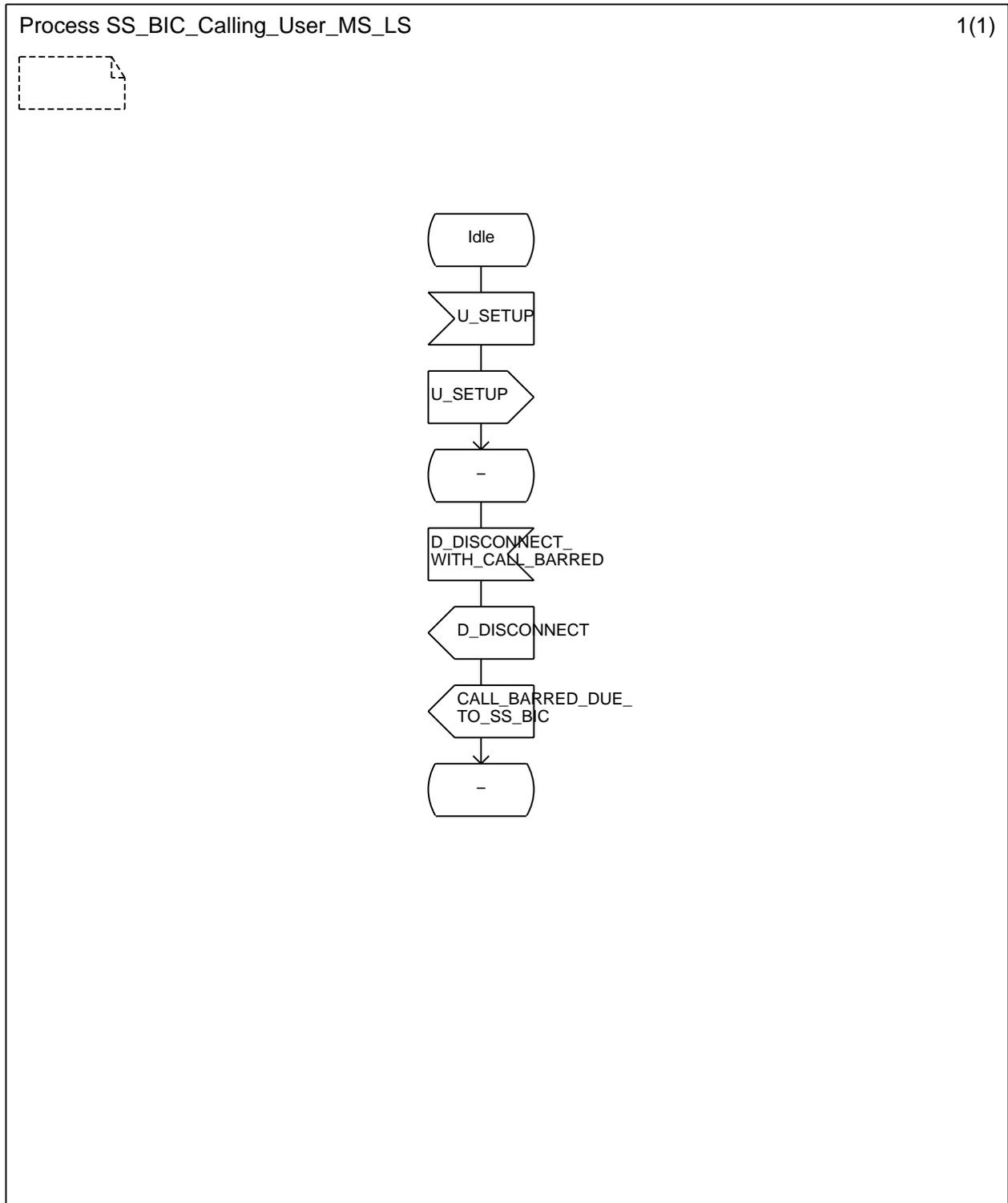


Figure A.1: SDL representations of SS-BIC at calling user MS/LS

A.2 SDL representations of SS-BIC at calling user SwMI

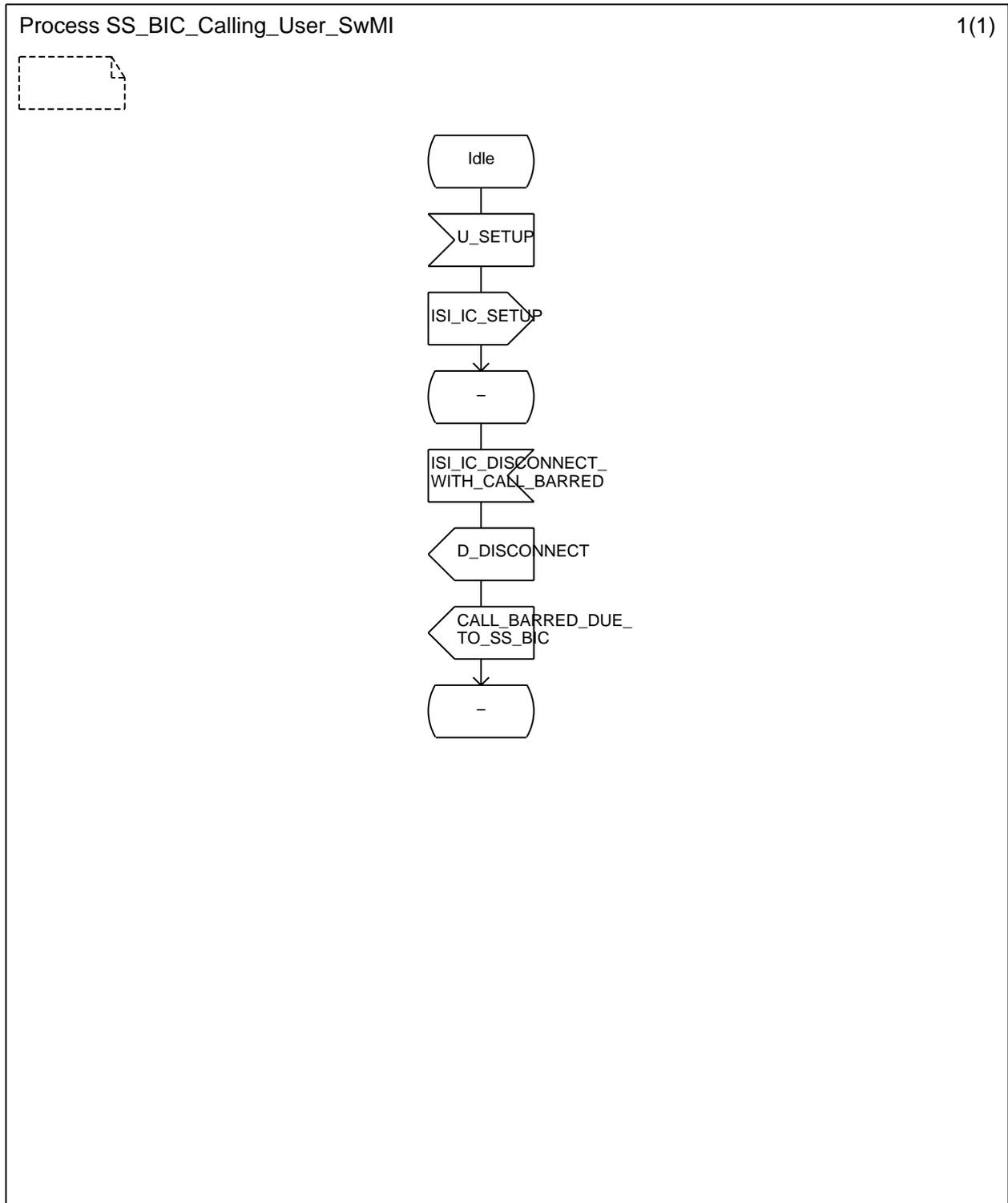
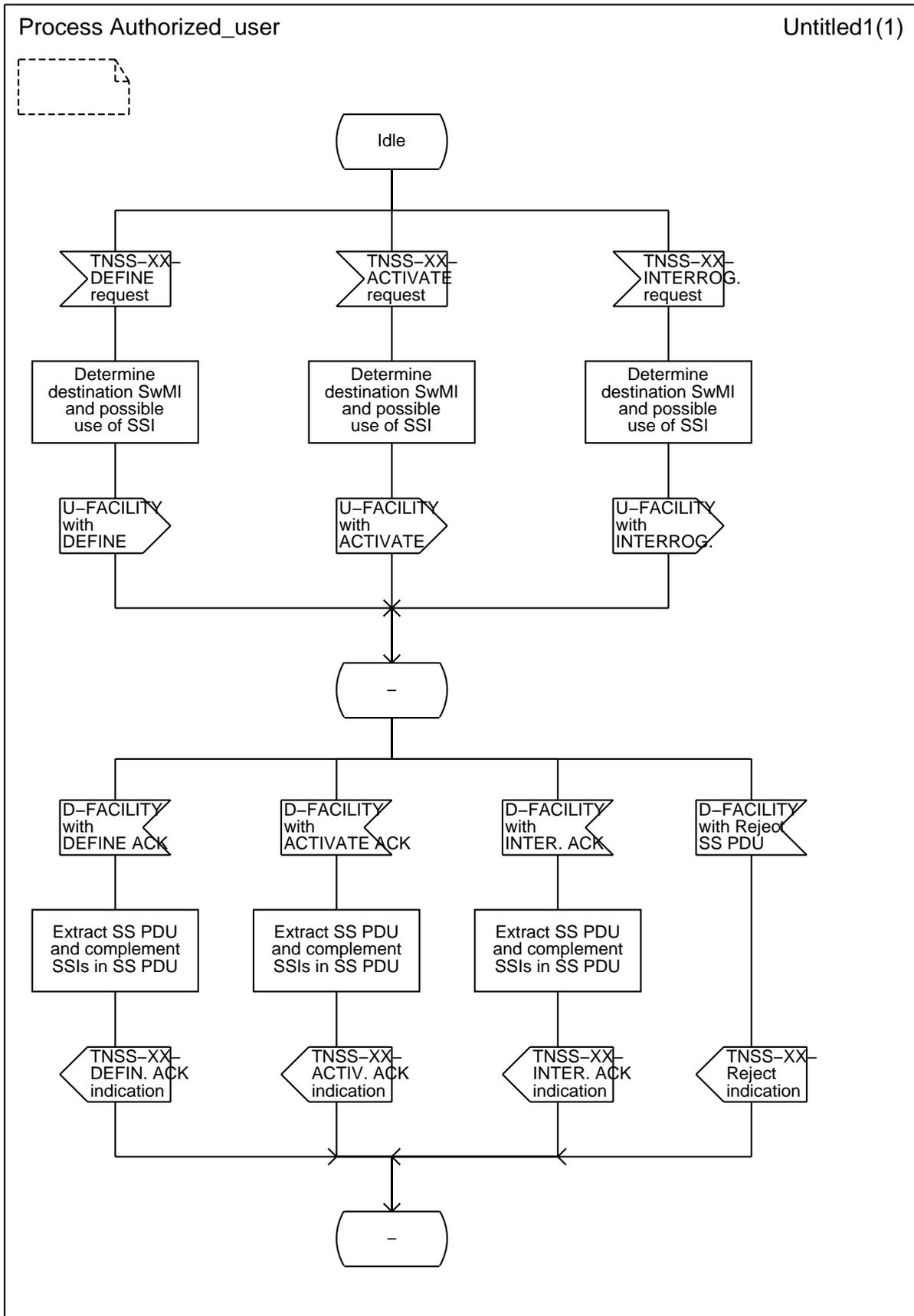


Figure A.2: SDL representations of SS-BIC at calling user home SwMI

A.3 SDL representations of SS-BIC at authorized user MS/LS

Figure A.3 shows the behaviour of the SS-BIC control entity within the authorized user MS/LS.

- Input signals from the right and output signals to the right represent air interface PDUs.
- Input signals from the left and output signals to the left represent primitives to the authorized user.



NOTE: In the case of SS-BIC, the served user has no authorized user capabilities; this SDL is not applicable to the served user MS/LS.

Figure A.3: Authorized user MS/LS SDL

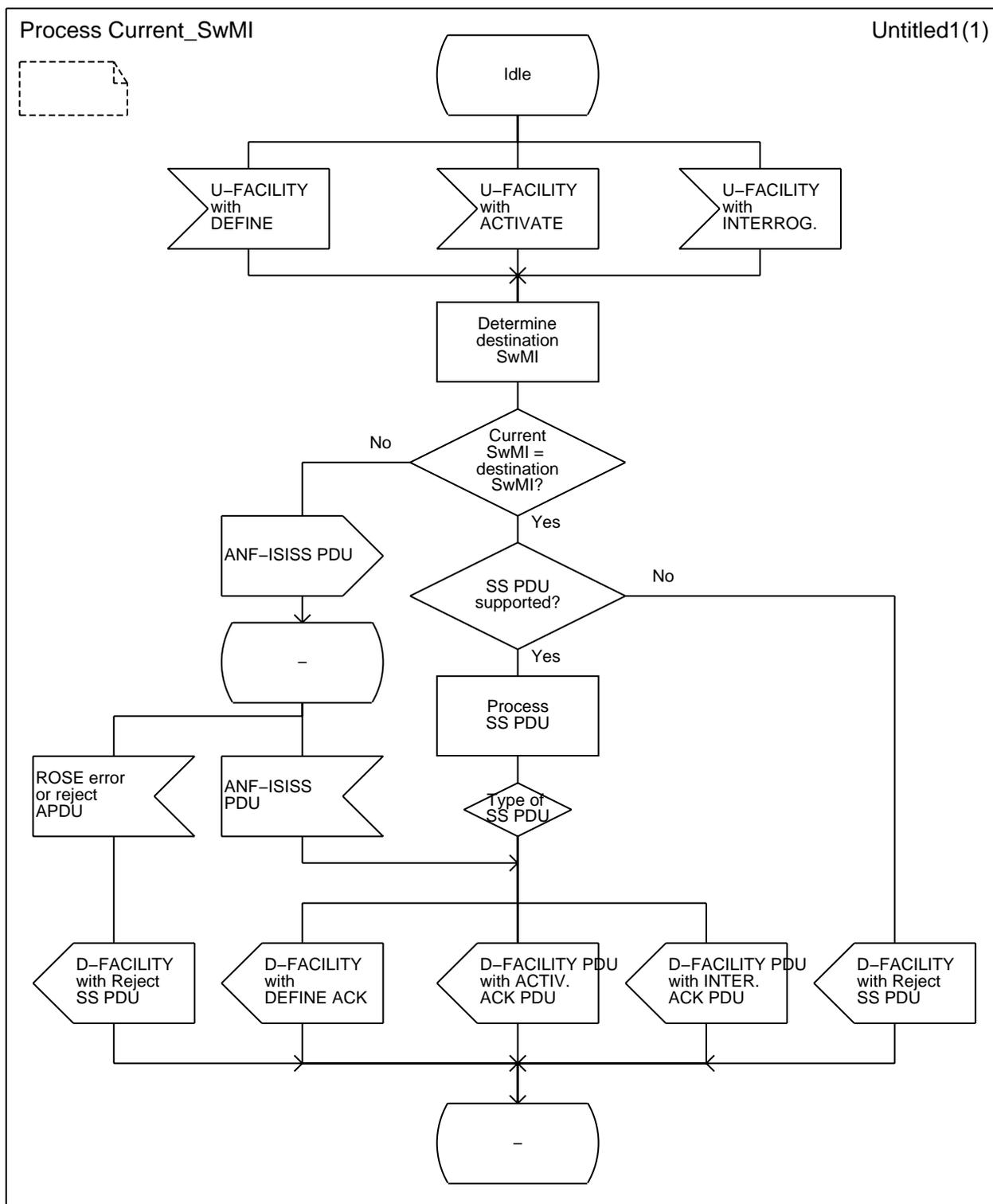
A.4 SDL representations of SS-BIC at SwMI where authorized user is registered

Figure A.4 shows the behaviour of the SS-BIC control entity specific to the SwMI where the authorized user is registered.

Depending on whether or not this SwMI is also the SS-BIC restricted user home SwMI, it is or it not the destination SwMI of the DEFINE or INTERROGATE PDUs sent by the authorized user MS/LS.

- Input signals from the right represent PDUs received from the SS-BIC restricted user home SwMI.
- Output signals to the right represent PDUs sent to the SS-BIC restricted user home SwMI.
- Input signals from the left represent PDUs received from the authorized user MS/LS.
- Output signals to the left represent PDUs sent to the authorized user MS/LS.

NOTE 1: While this SDL representation is generic for all supplementary services, ACTIVATE and ACTIVATE ACK are not defined in the case of SS-BIC.



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.

Figure A.4: Authorized user current SwMI SDL

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 A.4 to the SwMI where the authorized user is registered.

A.5 SDL representation of SS-BIC at SS-BIC called user home SwMI

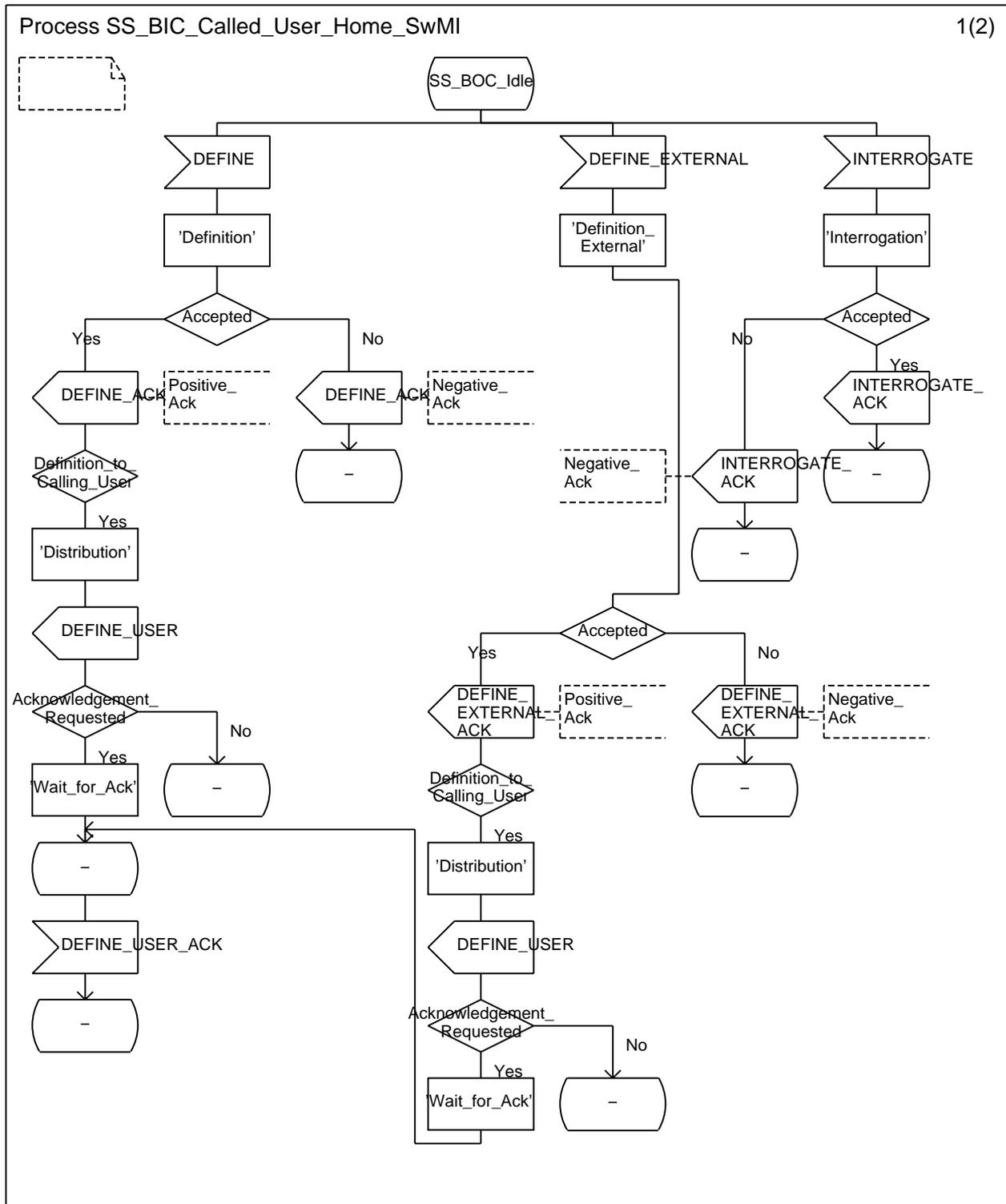


Figure A.5: SDL representations of SS-BIC at SS-BIC called user home SwMI (1/2)

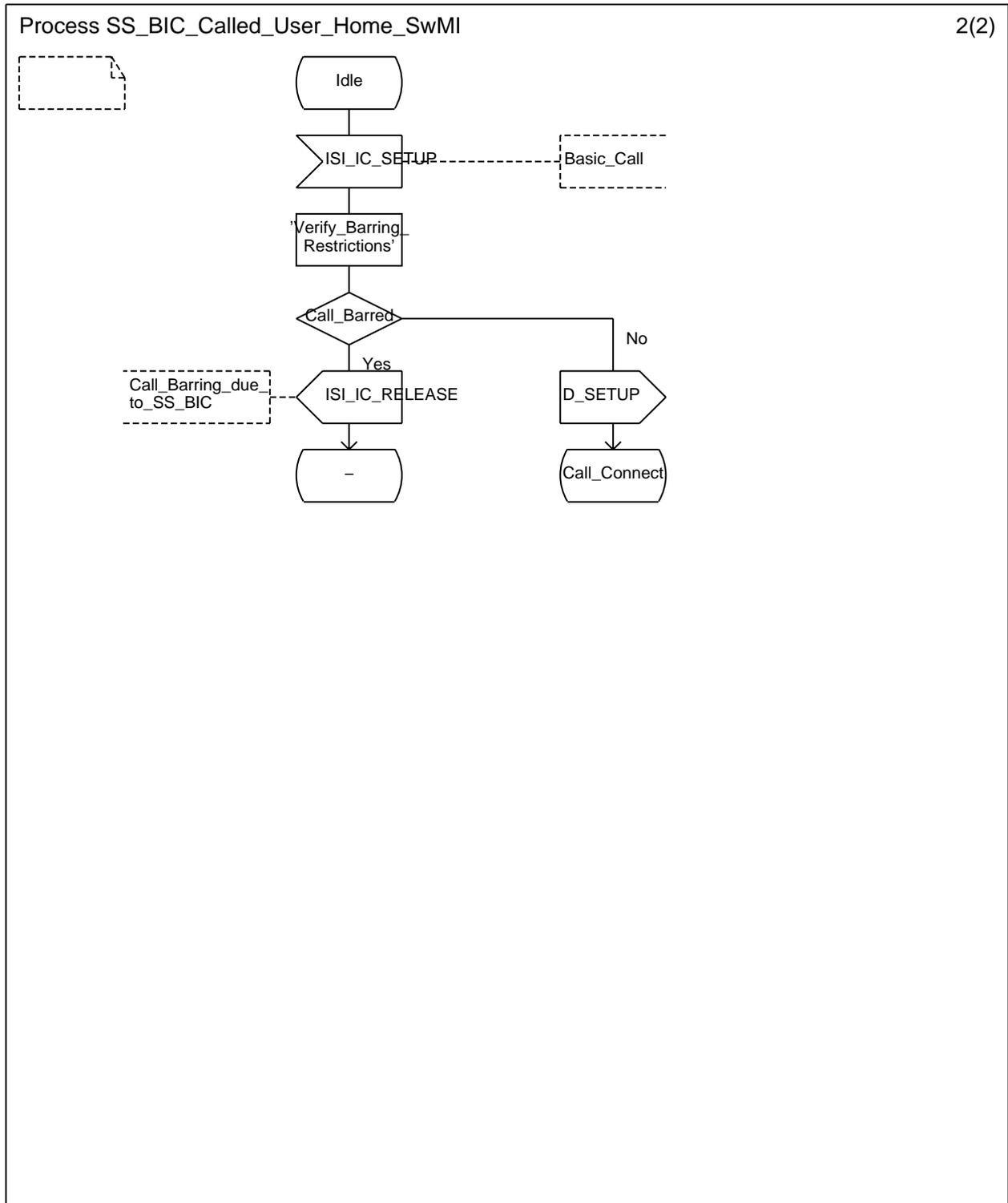


Figure A.5: SDL representations of SS-BIC at SS-BIC called user home SwMI (2/2)

A.6 SDL representation of SS-BIC at SS-BIC called user MS/LS

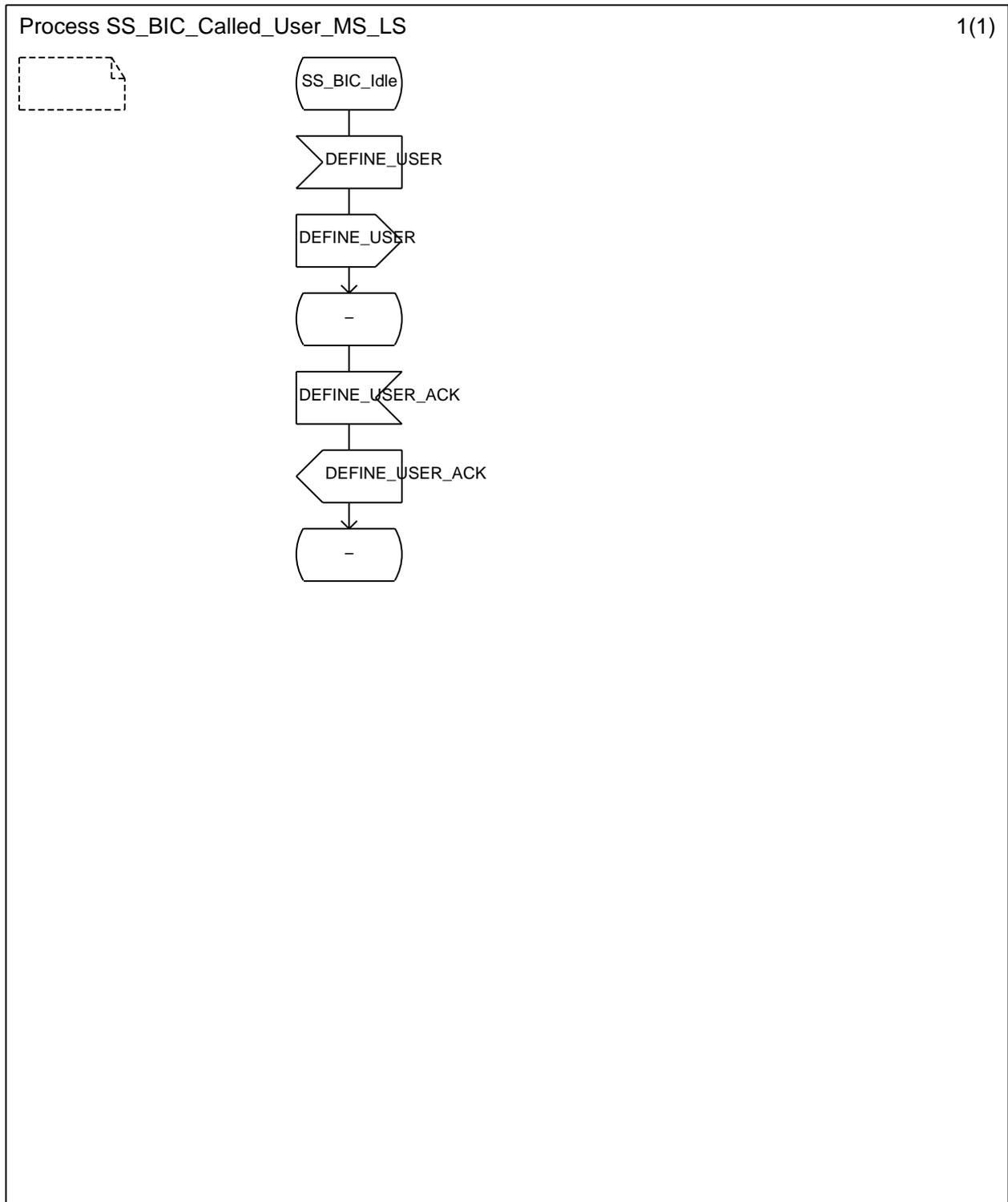


Figure A.6: SDL representations of SS-BIC at SS-BIC called user MS/LS

Annex B (informative): Bibliography

ETSI EN 300 392-11-19: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 11: Supplementary services stage 2; Sub-part 19: Barring of Incoming Calls (BIC)".

History

Document history		
Edition 1	December 1996	Public Enquiry PE 120: 1996-12-16 to 1997-04-11
	June 2001	Converted into an EN between Public Enquiry and Vote
V1.1.1	June 2001	Vote V 20010803: 2001-06-04 to 2001-08-03
V1.1.1	August 2001	Publication