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Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary Services (SS) Stage 3; Part 12-18: Barring of Outgoing Calls (BOC)

ETSI

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Contents

Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS is a multi-part standard and will consist of the following parts:

Part 1: "General network design".

Part 2: "Air Interface (AI)".

Part 3: "Inter-working", (DE/RES-06001-3).

Part 4: "Gateways", (DE/RES-06001-4).

Part 5: "Terminal equipment interface", (DE/RES-06001-5).

Part 6: "Line connected stations", (DE/RES-06001-6).

Part 7: "Security".

Part 8: "Management services", (DE/RES-06001-8).

Part 10: "Supplementary Services (SS) Stage 1".

Part 11: "Supplementary Services (SS) Stage 2".

Part 12: "Supplementary Services (SS) Stage 3".

Part 13: "SDL Model of the Air Interface".

Part 14: "PICS Proforma".

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

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1 Scope

This European Telecommunication Standard (ETS) defines the stage 3 specification of the Barring of Outgoing Call (BOC) supplementary service for the Trans-European Trunked Radio (TETRA).

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

SS-BOC is invoked for outgoing 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 this ETS.

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 implementational 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.

2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 392-2: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".

[2] ETS 300 392-1: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D), Part 1: General network design".

[3] ETS 300 392-10-1: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part: 10: Supplementary services stage 1; Part 10-1: Call diversion".

[4] ETS 300 392-10-6: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part: 10: Supplementary services stage 1; Part 10-6: Call authorised by dispatcher".

[5] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

3 Definitions and abbreviations

3.1 Definitions

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

affected user: Functional Entity 1 (FE1), the user on whose behalf the outgoing services are barred. The SS-BOC is defined for affected user's individual subscriber identity.

authorised user: FE3, the user who is permitted to define SS-BOC on affected user's behalf.

basic service: Circuit mode speech service and circuit mode data service, see ETS 300 392-2 [1], clause 11.

called party: FE5, the party to whom the barred service request is made.

Functional Entity (FE): Functional Entity performs the SS-BOC specific tasks in a MS, a LS or a SwMI.

home system: The TETRA network which Mobile Network Identity (MNI) is equal to the user's MNI. The SS-BOC definition is saved in the home system and home system is responsible for transporting the SS-BOC definition to visited system(s).

Inter System Interface (ISI): The interface between two TETRA networks, that enables the inter-working of services between these two systems.

Mobile Network Identity (MNI): Mobile Country Code (MCC) and Mobile Network Code (MNC) of the TETRA Subscriber Identity (TSI).

Mobile Station (MS): A physical grouping that contains all of the mobile equipment that is used to obtain TETRA services. By definition, a mobile station contains at least one Mobile Radio Stack.

packet data service: Connection oriented packet mode data service and connectionless packet mode data service, see ETS 300 392-2 [1], clauses 24 and 26 respectively.

operation: The act of performing a service, e.g. in case of SS-BOC the barring of a call.

Switching and Management Infrastructure (SwMI): All of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals. The SwMI enables subscriber terminals to communicate with each other via the SwMI.

visited system: The TETRA network which MNI is not equal to the user's MNI.

3.2 Abbreviations

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

CC	Call Control sub-entity for SS-BOC in CMCE in SwMI
CCA	Call Control sub-entity for SS-BOC in CMCE in MS/LS
CMCE	Circuit Mode Control Entity
CONS	Connection Oriented Network Service
FE	Functional Entity
ISI	Inter System Interface
LS	Line Station
MCC	Mobile Country Code
MLE	Mobile Link Entity
MNC	Mobile Network Code
MS	Mobile Station
PDU	Protocol Data Unit
SAP	Service Access Point
SCLNS	Specific ConnectionLess Network Service
SS	Supplementary service sub-entity within CMCE
SS-BOC	Supplementary Service Barring of Outgoing Calls
SSI	Short Subscriber Identity
SwMI	Switching and Management Infrastructure
TETRA	Trans-European Trunked Radio
TNCC-SAP	Call Control Service Access Point
TNCO-SAP	Connection Oriented network service Service Access Point
TNSCLNS-SAP	Specific ConnectionLess Network Service Service Access Point
TNSS-SAP	Supplementary Service Service Access Point
TSI	TETRA Subscriber Identity

4 SS-BOC stage 3 specification

4.1 Functional model description

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

FE1: SS sub-entity in Circuit Mode Control Entity (CMCE) for SS-BOC in affected user's MS/LS;

FE2: SS sub-entity in CMCE for SS-BOC in SwMI;

FE3: SS sub-entity in CMCE for SS-BOC in authorised user's MS/LS;

FE4: generic SS sub-entity in CMCE for SS-BOC in SwMI;

FE5: SS sub-entity in CMCE for SS-BOC in called party's MS/LS;

CC: Call Control sub-entity for SS-BOC in CMCE in SwMI;

CCA: Call Control sub-entity for SS-BOC in CMCE in MS/LS.

NOTE: The SS-BOC functionality in CC/CCA is also applicable for packet data service, unless otherwise mentioned.

The following relationships shall exist between these FEs:

ra between FE1 and FE2;

rb between FE2 and FE4 in different TETRA systems;

rc between FE2 and FE3;

rd between FE2 and FE2 in different TETRA systems;

re between FE1 and FE4;

rf between FE3 and FE4;

rg between FE2 and FE5.

Figures 1 and 2 shows these FEs and their relationships. Figure 1 gives the functional model for the management part and figure 2 gives the functional model for the operational part.

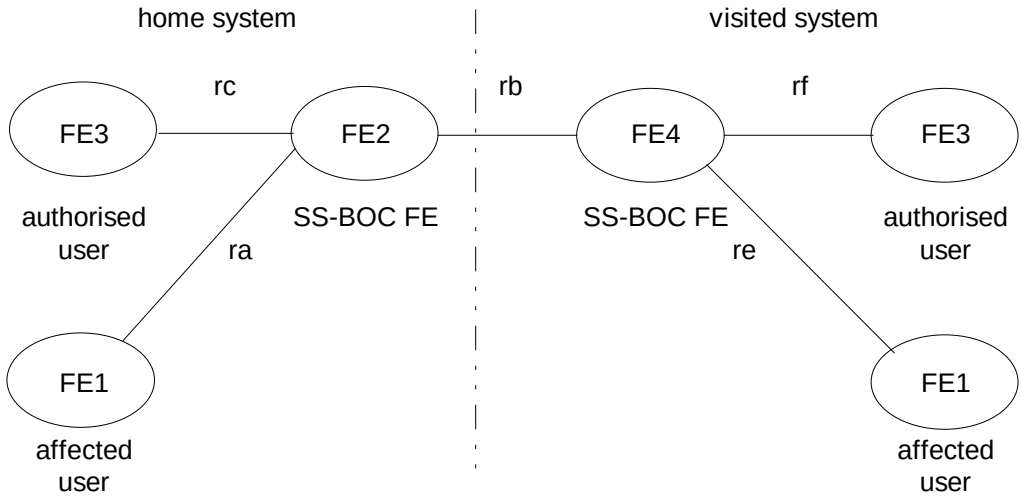
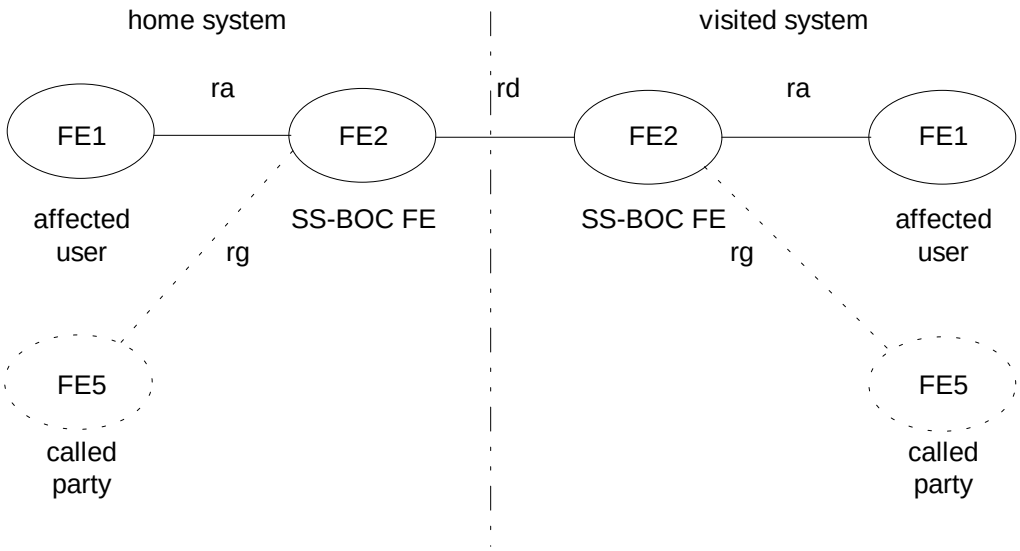


Figure 1: Functional model for the management part



NOTE: FE5 does not receive any indication of the barred service.

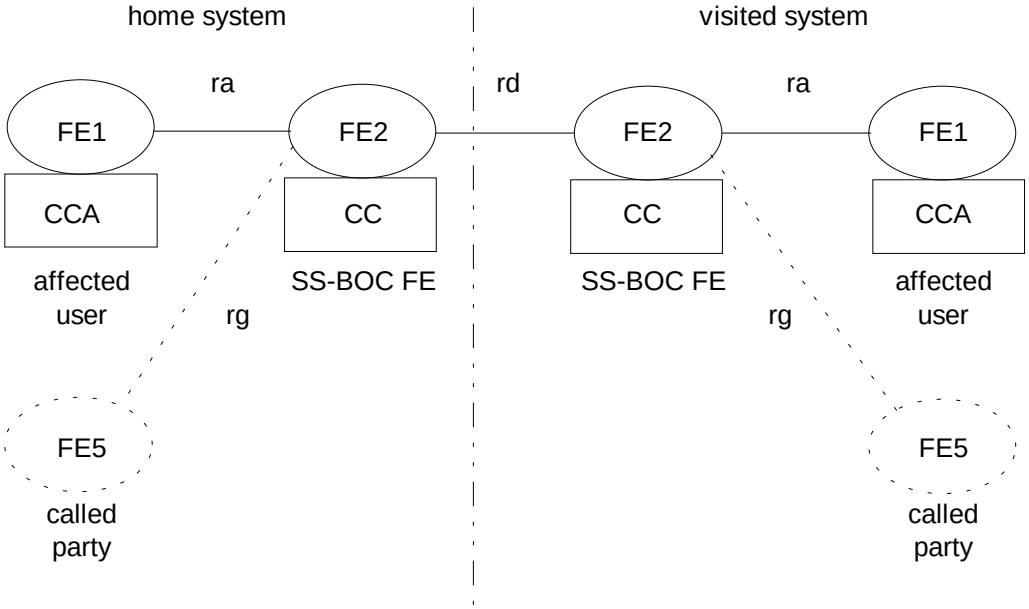
Figure 2: Functional model for the operational part

4.2 Relationship with a basic and packet data service

FE2 shall be collocated to CC in SwMI.

FE1 shall be collocated to CCA.

The relationship with basic and packet data service is shown in figure 3.



NOTE: FE5 does not receive any indication of the barred service.

Figure 3: Relationships with FEs and CCs/CCAs

5 SS-BOC service description

5.1 General

This clause describes SS-BOC services offered by Supplementary Service (SS) and call control sub-entities of CMCE, Connection Oriented Network Service (CONS) and Specific ConnectionLess Network Service (SCLNS) of the TETRA voice plus data layer 3 service boundary in MS/LS.

NOTE: The layer 3 services and service boundary for SwMI are outside the scope of this ETS.

The SS-BOC services shall be offered at:

- Supplementary Services Service Access Point (TNSS-SAP);
- Call Control Service Access Point (TNCC-SAP);
- Connection Oriented network service Service Access Point (TNCO-SAP);
- Specific ConnectionLess Network Service Service Access Point (TNSCLNS-SAP).

The SS-BOC services described in this clause shall complement the SS service, the call control service, CONS and SCLNS specified in ETS 300 392-2 [1], clauses 12, 11, 24 and 26 respectively.

5.2 Offered services

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

The following SS-BOC services shall be provided:

- barring indication: barring indication for a basic service (call control service) or packet data service (CONS, SCLNS) that the user has requested.

The following SS-BOC services may be provided:

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

5.3 TNSS-SAP

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

The SS-BOC service elements shall be carried as elements within the following three general generic supplementary services primitives over TNSS-SAP:

a) TNSS-SERVICE;

b) TNSS-INFO;

c) TNSS-ERROR.

Figure 4 illustrates the flow for generic SS primitives.

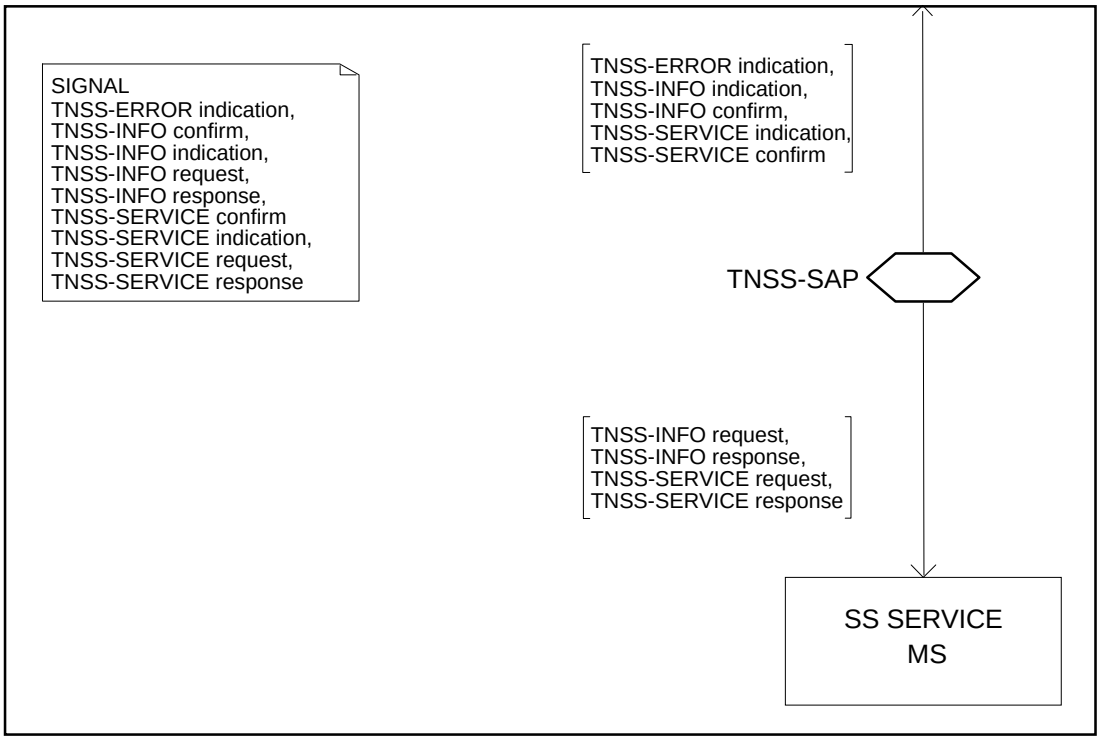


Figure 4: The flow for generic SS primitives

TNSS-SERVICE shall enable an invoking entity to request and to be informed about, an operation to be performed by the performing entity.

TNSS-INFO shall enable an entity to be informed of ongoing transactions.

TNSS-ERROR shall enable a performing entity to return the negative reply of a unsuccessfully performed operation to the invoking entity.

For a detailed description of the generic supplementary service primitives refer to ETS 300 392-2 [1], subclause 12.3.

5.4 TNCC-SAP

The SS-BOC barring indication for call control service shall be provided at TNCC-SAP.

The SS-BOC service element shall be carried 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 ETS 300 392-2 [1], subclause 11.3.

5.5 TNSCLNS-SAP

The SS-BOC barring indication for SCLNS shall be provided at TNSCLNS-SAP.

The SS-BOC barring indication shall be carried within the TN-DELIVERY indication at TNSCLNS-SAP. The parameter Disposition Report shall be mapped from Disposition element within DELIVERY PDU to TN-DELIVERY indication, as defined in ETS 300 392-2 [1], clause 26.

5.6 TNCO-SAP

The SS-BOC barring indication for CONS shall be provided at TNCO-SAP.

The SS-BOC service elements shall be carried within the N-DISCONNECT indication primitives over TNCO-SAP. The barring shall be indicated by mapping the Clearing cause and Diagnostic code from CLEAR INDICATION packet to N-DISCONNECT indication, as defined in ETS 300 392-2 [1], clause 24.

5.7 SS-BOC services offered over the TNSS-SAP

5.7.1 SS-BOC primitives

The generic supplementary service primitives shall contain the following SS-BOC primitives.

a) DEFINE request;

b) DEFINE confirm;

c) INFORM-USER indication;

d) INFORM-USER response;

e) INTERROGATE request;

f) INTERROGATE confirm;

g) CALL-BARRED indication.

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

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

5.7.2 DEFINE request

DEFINE request shall be offered from application to FE3 to define SS-BOC on affected user's behalf. The primitive shall contain the parameters listed in table 1.

Parameter definitions:

- Subscriber identity defines the restricted identity. If there are several subscriber identities given in the primitive, the following definitions shall be requested to all the identities.
- Definition type indicates if the definition shall be an addition, replacement of removal of a previously made definition.

  NOTE: It is possible that there is no previous SS-BOC definition.
- Services outside closed user group causes barring of service requests received to a party outside the given closed group. The closed user group definition is outside the scope of this ETS.
- Service causes barring of the given service.
- Address string causes barring of a service requested by a user whose identity is or starts with the given string.
- Exception to address string allows services requested by a user whose identity is or starts with the given string. It shall be used to enable exceptions to restricting Address string definitions and it overrides these definitions, when the Exception to address string is longer than a Address string element.

- Delivery to affected user(s) indicates that SwMI shall send the definition to affected user for his information.

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

Table 1: DEFINE request contents

Parameter	Req	Remark
SS Type	M	SS-BOC
Operation type	M	Definition
Number of subscriber identities	M	
Subscriber identity	M	repeatable (note 1)
Definition type	M	
Services outside closed user group	C	(note 2)
Number of services	C	(note 2)
Service	C	repeatable (note 2) (note 3)
Number of address strings	C	(note 2) (note 3)
Address string	C	repeatable (note 2) (note 4)
Number of exceptions to address strings	C	(note 2)
Exception to address string	C	repeatable (note 2) (note 5)
Delivery to affected user(s)	M	
Acknowledgement requested	M	
NOTE 1: Element should be present and interpreted as indicated by the element Number of subscriber identity elements. NOTE 2: Element shall be present only if the Definition type is addition or replacement. NOTE 3: Service element should be repeated as many times as indicated in the element Number of services elements. NOTE 4: Address string elements should be repeated as many times as indicated in the element Number of address strings elements. NOTE 5: Exceptions to address string elements should be repeated as many times as indicated in the element Number of exceptions to address strings elements.		

5.7.3 DEFINE confirm

DEFINE confirm shall be offered from FE3 to application as an acknowledgement to a previously made definition request. The primitive shall contain the parameters listed in table 2.

If there are several subscriber identities given in the primitive, the definition result shall be valid to all the identities.

Table 2: DEFINE confirm contents

Parameter	Con	Remark
SS Type	M	SS-BOC
Operation type	M	Definition
Number of subscriber identities	M	
Subscriber identity (note)	M	repeatable
Definition result	M	
NOTE: Element should be present and interpreted as indicated by the element Number of subscriber identity elements.		

5.7.4 INFORM-USER indication

INFORM-USER indication shall be offered from FE1 to application to indicate SS-BOC definition made on affected user's behalf. The primitive shall contain the parameters listed in table 3.

For parameter definitions, see DEFINE request.

Table 3: INFORM-USER indication contents

Parameter	Ind	Remark
SS Type	M	SS-BOC
Operation type	M	Distribution
Number of subscriber identities	M	
Subscriber identity	M	repeatable (note 1)
Definition type	M	
Services outside closed user group	C	(note 2)
Number of services	C	(note 2)
Service	C	repeatable (note 2) (note 3)
Number of address strings	C	(note 2) (note 3)
Address string	C	repeatable (note 2) (note 4)
Number of exceptions to address strings	C	(note 2)
Exception to address string	C	repeatable (note 2) (note 5)
Acknowledgement requested	M	

NOTE 1: Element should be present and interpreted as indicated by the element Number of subscriber identity elements.
NOTE 2: Element shall be present only if the Definition type is addition or replacement.
NOTE 3: Service element should be repeated as many times as indicated in the element Number of services elements.
NOTE 4: Address string elements should be repeated as many times as indicated in the element Number of address strings elements.
NOTE 5: Exceptions to address string elements should be repeated as many times as indicated in the element Number of exceptions to address strings elements.

5.7.5 INFORM-USER response

INFORM-USER response shall be offered from FE3 to application if the element Acknowledgement requested from affected user(s) in received INFORM-USER request had the value "acknowledgement requested". The primitive shall contain the parameters listed in table 4.

If there are several subscriber identities given in the primitive, the Distribution result shall be valid to all the identities.

Table 4: INFORM-USER response contents

Parameter	Res	Remark
SS Type	M	SS-BOC
Operation type	M	Distribution
Number of subscriber identities	M	
Subscriber identity (note)	M	repeatable
Distribution result	M	

NOTE: Element should be present and interpreted as indicated by the element Number of subscriber identity elements.

5.7.6 INTERROGATE request

INTERROGATE request shall be offered from application to FE1 or FE3 to interrogate a SS-BOC definition. The primitive shall contain parameters listed in table 5.

Table 5: INTERROGATE request contents

Parameter	Req	Remark
SS Type	M	SS-BOC
Operation type	M	Interrogation
Number of subscriber identities	M	
Subscriber identity (note)	M	repeatable
NOTE: Element should be present and interpreted as indicated by the element Number of subscriber identity elements.		

5.7.7 INTERROGATE confirm

INTERROGATE confirm shall be offered from FE1 or FE3 to application as a response to a previously sent interrogation request. INTERROGATE confirm shall contain the parameters listed in table 6.

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-BOC is defined for the given identity or identities. For other parameter definitions, see DEFINE request.

Table 6: INTERROGATE confirm contents

Parameter	Con	Remark
SS Type	M	SS-BOC
Operation type	M	Interrogation
Number of subscriber identities	M	
Subscriber identity	M	repeatable (note 1)
Interrogation result	M	
Services outside closed user group	C	(note 2)
Number of services	C	(note 2)
Service	C	repeatable (note 2) (note 3)
Number of address strings	C	(note 2) (note 3)
Address string	C	repeatable (note 2) (note 4)
Number of exceptions to address strings	C	(note 2)
Exception to address string	C	repeatable (note 2) (note 5)
Delivery to affected user(s)	C	(note 2)
Acknowledgement requested	C	(note 2)

NOTE 1: Element should be present and interpreted as indicated by the element Number of subscriber identity elements.
NOTE 2: Element shall be present only if the Interrogation result is:
accepted;
accepted, but definition sending to the affected user pending in the SwMI; or,
accepted, but the affected user has acknowledged negatively definition information;
NOTE 3: Service element should be repeated as many times as indicated in the element Number of services elements.
NOTE 4: Address string elements should be repeated as many times as indicated in the element Number of address strings elements.
NOTE 5: Exceptions to address string elements should be repeated as many times as indicated in the element Number of exceptions to address strings elements.

5.7.8 CALL-BARRED indication

CALL-BARRED indication shall be applied for the relationship ra and shall be given from FE1 to application as an indication that the basic service invocation has been barred due to SS-BOC.

The contents of the information flow is shown in the table 7.

Table 7: CALL-BARRED indication contents

Parameter	Ind	Remark
SS Type	M	SS-BOC
Operation type	M	Operation
Rejection cause	M	

5.8 Parameter descriptions

Acknowledgement requested =

0 Acknowledgement requested from affected user(s);
1 Acknowledgement not requested from affected user(s).

Definition result =

0 accepted by SwMI;
1 accepted but some definition values changed by SwMI;
2 request failed for any reason;
3 user not authorised;
4 unknown TETRA identity;
5 parameters not valid;
6 insufficient information.

Definition type =

0 Definition;
1 Addition;
2 Removal.

Delivery to affected user(s) =

0 Delivery to affected user(s);
1 No delivery to affected user(s).

Digit =

0 0;
1 1;
... etc.
9 9.

Distribution result =

0 successfully received by MS/LS;
2 request failed for any reason;
3 user not authorised;
4 unknown TETRA identity;
5 parameters not valid;
6 insufficient information.

Exception to address string =

Table 8: Exception to address string parameter contents

Parameter	C/O/M	Remark
Length of address string	C	(note 1)
Digit	C	repeatable, (note 2)
NOTE 1: If Number of exceptions to address string element is present, element shall be present.		
NOTE 2: Element shall be present as many times as indicated by the element Length of address string.		

Interrogation result =

0 accepted;
1 accepted, but definition sending to the affected user pending in the SwMI;

NOTE 1: The result is also applicable for affected users.

2 accepted, but the affected user has acknowledged negatively definition information;

NOTE 2: The result is also applicable for affected users.

3 SS-BOC not defined for given subscriber identity;

4 request failed for any reason;
5 user not authorised;
6 unknown TETRA identity;
7 parameters not valid;
8 insufficient information.

Length of address string =

0 1 number in the string;
1 2 numbers in the string;
2 3 numbers in the string;
...etc. ...etc.
15 16 numbers in the string.

Number of Exceptions to address strings =

0 0 address strings;
1 1 address string;
...etc. ...etc.
9 10 address strings.

Number of Services =

0 0 elements;
1 1 element;
2 2 elements;
3 3 elements;
4 4 elements.

Number of address strings =

as Number of Exceptions to address string elements.

Number of Subscriber identity elements =

0 subscriber identity, 1 subscriber identity following;
1 range of identities, 2 subscriber identities following;
2 list of subscriber identities, 2 subscriber identities following;
3 list of subscriber identities, 3 subscriber identities following;
4 list of subscriber identities, 4 subscriber identities following;
5 list of subscriber identities, 5 subscriber identities following;
6 list of subscriber identities, 6 subscriber identities following;
7 list of subscriber identities, 7 subscriber identities following;
8 list of subscriber identities, 8 subscriber identities following;
9 list of subscriber identities, 9 subscriber identities following;
10 list of subscriber identities, 10 subscriber identities following.

Rejection cause =

0 calling party outside allowed user group;
1 restricted service type;
2 restricted source address.

Service =

0 All applicable services;
1 Circuit mode speech service;
2 Circuit mode data service;
3 Connectionless packet mode data service;
4 Connection-oriented packet mode data service.

Source address string =

as Exception to address string.

Subscriber identity =

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

5.9 Mapping of SS-BOC primitives to TNSS primitives

SS-BOC primitives shall be mapped by functional entities (FEs) to TNSS-SERVICE, TNSS-INFO and TNSS-ERROR primitives according to table 9.

Table 9: Mapping of the SS-BOC primitives to TNSS primitives

SS-BOC Primitive	TNSS-SERVICE request	TNSS-SERVICE confirm	TNSS-SERVICE indication	TNSS-SERVICE response	TNSS-ERROR indication
DEFINE req	in FE3	-	-	-	note
DEFINE con	-	in FE3	-	-	note
INFORM-USER ind	-	-	in FE1	-	note
INFORM-USER res	-	-	-	in FE1	note
INTERROGATE req	in FE3/FE1	-	-	-	note
INTERROGATE con	-	in FE3/FE1	-	-	note
CALL-BARRED ind			in FE1		
NOTE: FE1/FE3 should include a primitive received from application or from FE2/FE4 in a TNSS-ERROR indication, if the FE cannot recognize or accept the primitive.					

6 SS-BOC protocol description

6.1 General

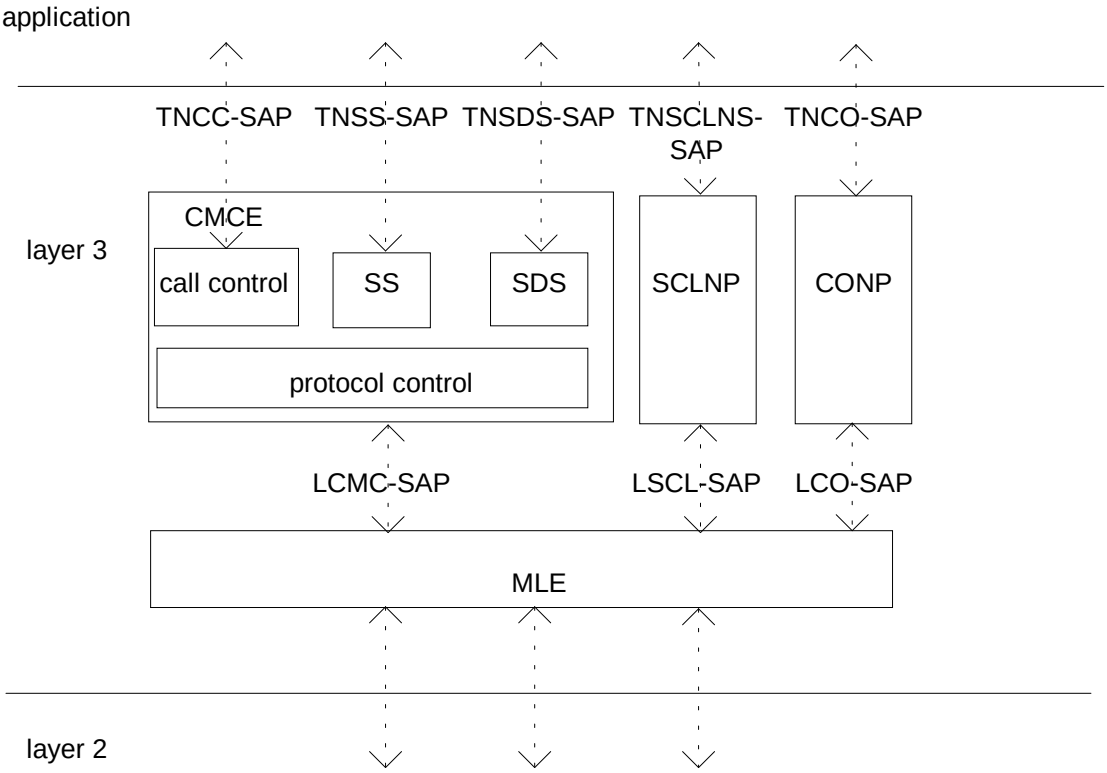
This clause defines the SS-BOC layer 3 protocol for the SS-BOC services specified in clause 5. The SS-BOC protocol comprises of sub-protocols defined for SS and call control within CMCE and for CONP and SCLNP. These SS-BOC sub-protocols complement the SS, call control, CONP and SCLNP protocols defined in ETS 300 392-2, clauses 12, 11, 25 and 27 respectively.

The barring within CONP and SCLNP shall follow the principles specified in this clause for call control. However, there is no SS sub-entity within CONP or within SCLNP and call related SS sub-entity actions specified for CCAs are not valid for CONP nor SCLNP.

This ETS 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.

Figure 5 shows the position of the Layer 3 in MS/LS for SS and call control sub-entities within the CMCE, and SCLNP and CONP sub-entities.



NOTE: SS-BOC is not applicable for Short Data Service (SDS).

Figure 5: General position of CMCE, SCLNP and CONP

The SS-BOC information shall be conveyed from CMCE to Mobile Link Entity (MLE) or from MLE to CMCE over LCMC-SAP in:

- SS FACILTY element, if the information is produced or addressed to SS sub-entity. For the different PDU contents within the Facility element, see subclause 6.3. The SS FACILITY element shall be conveyed in any suitable CMCE PDU, see ETS 300 392-2 [1], subclause 14.7.

- The barring shall be indicated within D-RELEASE or D-DISCONNECT PDU with the following two elements:

  - in the Disconnect cause element, which shall have the value Not allowed traffic case;
  - in the Facility element within the CALL-BARRED PDU, see subclause 6.3.

  For complete description of D-RELEASE or D-DISCONNECT PDU, see ETS 300 392-2 [1], subclause 14.7.

The SS-BOC information shall be conveyed from SCLNP to MLE or from MLE to SCLNP over LSCL-SAP in:

- At calling party's request, the barring shall be indicated in the Disposition element, which shall have the value Illegal service request - packet discarded ("1000 0000"), see ETS 300 392-2 [1], clause 27.

The SS-BOC information shall be conveyed from CONP to MLE or from MLE to CONP over LCO-SAP in:

- The barring shall be indicated in the Clearing cause and Diagnostic code elements, which shall have the values Access barred and incoming call barred, respectively, and the information shall be conveyed within the CLEAR INDICATION packet, see ETS 300 392-2 [1], clause 24.

This clause shall specify the states and procedures for the Specification and Description Language (SDL) that is given in clause 7.

6.2 SS-BOC Protocol states

The normal SS-BOC protocol states are described below.

6.2.1 Protocol states of FE1

The protocol behaviour specified in this subclause specifies the actions of the SS sub-entity which is not related to any call, see ETS 300 392-2 [1], subclause 14.2.4.2, if not otherwise mentioned.

State IDLE is the normal state of FE1. In the state IDLE FE1 shall do the following optional tasks, if supported by the MS/LS:

- the composition and decomposition of SS-BOC PDUs;
- upon reception of an SS-BOC definition information from SwMI, FE1 shall pass the information to application, if the definition is made to the individual subscriber identity of FE1;
- upon reception of an acknowledgement to SS-BOC definition information from application, FE1 shall send it to SwMI;
- upon reception of an SS-BOC interrogation request from user, FE1 shall send it to the SwMI;
- upon reception of an SS-BOC interrogation response from SwMI, FE1 shall pass it to application;
- upon reception of a barring indication, FE1 shall pass it to the application.

  NOTE: The barring indication is received and processed by the SS sub-entity, which has a fixed relationship with the call control sub-entity.

The parameters in the interrogation PDUs shall be interpreted as described in subclause 6.3.2.

6.2.2 Protocol states of CCA to which FE1 is collocated

6.2.2.1 State IDLE

CCA to which FE1 is collocated shall be able to receive call invocation requests from the application. The invocation shall be sent to the SwMI.

6.2.2.2 State MO_CALL_SETUP

Upon reception of the call set-up rejection, FE1 shall terminate the call and indicate that to the application. The SS-BOC rejection is indicated to the Call control by the Disconnection cause having the value Not allowed traffic case.

6.2.3 Protocol states of FE2

6.2.3.1 State IDLE

State IDLE is the normal state of FE2. In the state IDLE FE2 should:

- compose and decompose SS-BOC PDUs;
- upon reception of an SS-BOC definition request, FE2 should:
  - save the SS-BOC definition into the SwMI, if the request is valid and authorised; and
  - acknowledge the SS-BOC definition request to FE3;
- if the parameter Delivery to affected users so indicates, FE2 should send the SS-BOC definitions to the concerned FE1(s). If the Acknowledgement from affected user(s) parameter is included in the DEFINE PDU, FE2 should start timer T1 and move to WAIT-FOR-ACK state;

- upon reception of an SS-BOC interrogation request from FE1 or FE3, FE2 should send the response to the request to FE1 or FE3 respectively.

FE2 shall apply the SS-BOC definition from the moment it is made.

6.2.3.2 State WAIT-FOR-ACK

In WAIT-FOR-ACK state FE2 should wait for the response(s) from FE1(s). When all FE1(s) have acknowledged the definition request or the timer T1 has expired, FE2 should return to state IDLE.

NOTE: As an operator option, FE2 may keep the definition requests in SwMI if any of the FE1(s) is not reachable and send them later, if one or more FE1s cannot be reached or has (have) not acknowledged the request.

6.2.4 Protocol states of CC to which FE2 is collocated

State IDLE shall be the normal state of CC to which FE2 is collocated. CC shall have the following tasks, if SS-BOC is supported in the SwMI: upon reception of a call or connection service request to FE1, CC should verify, if the barring shall take place, and if so, FE2 shall bar the call.

In case of an outgoing group call, which is requested by the restricted affected user from a visited system, CC in visited system may send the service request to CC in the home system as part of the normal call set-up procedure. If this is the case, the home system should bar the service and indicate that to the visited system, if the SS-BOC restrictions apply for the basic service.

NOTE: The SS-BOC functionality of the SS sub-entity which has fixed relationship with the call control sub-entity and the SS-BOC functionality of the call control sub-entity are not separated in this subclause.

6.2.5 Protocol states of FE3

The protocol behaviour specified in this subclause specifies the actions of the SS sub-entity which is not related to any call, see ETS 300 392 [1], subclause 14.2.4.2.

State IDLE is the normal state of FE3. In the state IDLE FE3 shall:

- compose and decompose SS-BOC PDUs;

- upon reception of an SS-BOC definition or interrogation request from application, FE3 shall send it to SwMI;

- upon reception of an SS-BOC definition or interrogation responses from SwMI, FE3 shall pass it to application.

The parameters in the interrogation and the definition PDUs shall be interpreted as described in subclause 6.3.2.

6.2.6 Protocol states of FE4

IDLE should be the normal and only state of FE4. In this state:

- compose and decompose SS-BOC PDUs;

- upon reception of an SS-BOC definition request, definition response or interrogation request from FE3 or FE1, FE4 should deliver it to FE2 in system 1;

- upon reception of an SS-BOC definition request, definition response or interrogation response from FE2, FE4 should deliver it to FE1 or FE3 located in system 2.

6.2.7 Protocol states of FE5

There are no protocol states for FE5 related to SS-BOC.

6.3 Procedures

The normal SS-BOC procedures are described below.

6.3.1 Procedures for FE1

No procedures for FE1.

6.3.2 Procedures for FE2

6.3.2.1 Definition in FE2

Upon reception of SS-BOC definition request, FE2 should verify that the request is authorised. If the request is authorised, FE2 should save the definition and acknowledge the request to the user.

NOTE 1: Only FE3 is authorised to define SS-BOC.

The parameters in the DEFINE PDU shall be interpreted in the following way:

- Subscriber identity: the SS-BOC definition shall be made to all given subscriber identity elements, if they refer to individual subscribers, and all elements in the DEFINE PDU shall refer to the subscribers given in the Subscriber identity element(s). In addition, in case of a range, the first and last elements of the range shall be given and the definition shall be valid for all given subscribers within the range.

- Definition type: shall indicate, if the given restrictions shall be used to:

  - replace previous restrictions;
  - add new restrictions; or,
  - remove previous restrictions.

  NOTE 2: Removal is used to remove all existing SS-BOC definitions.

- The restriction elements shall be used to bar incoming basic services, a basic service shall be barred, if at least one restriction applies:

  - services outside closed user group: all services to outside a closed user group.

  NOTE 3: The definition of the closed user group is outside the scope of this ETS.

  - services: the restricted service types;
  - address string: the restricted address strings.;
  - Exception to address string: the exception(s) to the restricted address strings. These address string override the restricted address strings, if the exception address string(s) are longer;

- Delivery to affected user(s): the SS-BOC definition shall be sent to the given subscriber identity or identities for information.

- Acknowledgement requested: the affected user(s) shall be requested to acknowledge the definition information.

If the definition request is rejected, the error indication shall be sent to user requesting the definition.

The acknowledgement for the definition (DEFINE-ACK) shall comprise of:

- Subscriber identity: shall indicate to which subscriber numbers the "Definition result" is valid;

  NOTE 4: If a definition is requested for a subscriber number range or a list of subscriber numbers, the "Result for definition" may be different for different subscriber and several DEFINE-ACKs are sent to FE3.

- Definition result: shall indicate the outcome of the definition request for the subscriber(s) 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 the case of result value "accepted, but definition values changed by SwMI" does not indicate what was changed.

6.3.2.2 Distribution in FE2

FE2 shall locate the FE1(s), make the INFORM-USER PDUs and distribute the PDUs to FE1s.

The parameter values are as described for Definition in FE2.

6.3.2.3 Interrogation in FE2

FE2 should verify that the interrogation is allowed, and if so, fetch the interrogated data in order to send it to the interrogating party (FE1 or FE3).

NOTE 1: FE1 is only allowed to interrogate his own SS-BOC definitions.

The parameter values for INTERROGATE-ACK are as described for Definition in FE2. However, the restriction parameters shall indicate all valid restrictions for the subscriber identity (identities) given in the INTERROGATE-ACK, and e.g. not the latest definition or removal action. The Delivery to affected user(s) and Acknowledgement form affected user(s) elements shall indicate if these had been requested and the value of the Interrogation result indicates the current situation, i.e. accepted, but definition sending to the affected user(s) pending in the SwMI, or, accepted, but negative ackn. received from affected user.

NOTE 2: If several definitions have been made, the Interrogation result value may not be valid for all distribution results.

6.3.3 Procedures for CC to which FE2 is collocated

Verify barring restrictions shall be the only procedure of CC to which FE2 is collocated. The outgoing service shall be barred if:

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

  NOTE 1: The definition for the closed user group is outside the scope of this ETS.

- the requested service type is a restricted service, e.g. circuit mode data service;

- the called party address is within a restricted address string, and if there is not an exception string that overrides the barring.

  NOTE 2: Supplementary Service Call Diversion (SS-CD), ETS 300 392-10-1 [3], does not have any impact on the SS-BOC. In other words, if the SS-BOC restrictions of the affected user apply to any basic service, the basic service is barred, even if the called party has diversion activated. The SS-BOC restrictions apply also, if the affected user is the called party and he has his basic services diverted.

  NOTE 3: Supplementary Service Call Authorised 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.

6.3.4 Procedures for FE3

No procedures for FE3.

6.3.5 Procedures for FE4

Routing address is the only procedure for FE4: If FE4 receives any information flow, that should be routed over ISI to another TETRA system, FE4 adds the routing address to the request and delivers it to FE2. If FE4 receives any information flow from another TETRA system over ISI, FE4 should deliver the request to FE1/FE3 located within the system.

6.3.6 Procedures for FE5

No procedures for FE5 related to SS-BOC.

6.4 Protocol timers

FE2 should use timer T1 to supervise the time it waits for acknowledgements from FE1(s) after FE2 has sent the definition information to FE1(s), if FE1s were requested to acknowledge the information.

6.5 PDU Descriptions

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

- in any call control PDU, if the MS/LS is engaged in a call; 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.

The element coding shall be in accordance with the general rules specified in ETS 300 392-2 [1], subclause 14.7. However, a conditional element may be conditional on a conditional element.

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

6.5.1 DEFINE

The SS-FACILITY element for DEFINE shall have the following general format as shown in table 10:

Table 10: DEFINE contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0001_2	Definition
Number of subscriber identities	4	1	M		
Subscriber identity		1	C		repeatable (note 1)
Definition type	2	1	M		
Services outside closed user group (note 2)	1	1	C	0	Restricted
				1	Not restricted
Service (note 2)		1	C		
Number of address strings (note 2)	4	1	C		
Address string (note 2)		1	C		repeatable (note 3)
Number of exceptions to address strings (note 2)	4	1	C		
Exception to address string (note 2)		1	C		repeatable (note 4)
Delivery to affected user(s)	1	1	M	0	To be delivered
				1	Not to be delivered
Acknowledgement from affected user(s)	1	1	M	0	Ackn. requested
				1	Ackn. not requested

NOTE 1: Element shall be interpreted and shall appear as many times as indicated in the Number of subscriber identities element.
NOTE 2: Element shall be conditional on the element Definition type:
Addition, replacement: element shall be present;
Removal: element shall not be present.
NOTE 3: The element shall be repeated as many times as indicated in the element Number of address strings.
NOTE 4: The element shall be repeated as many times as indicated in the element Number of exceptions to address strings.

6.5.2 DEFINE-ACK

The SS-FACILITY element for DEFINE-ACK shall have the following general format as shown in table 11:

Table 11: DEFINE-ACK contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0001_2	Definition
Number of subscriber identities	4	1	M		
Subscriber identity		1	C		repeatable (note)
Definition result	3	1	M		

NOTE: Element shall be interpreted and shall appear as many times as indicated in the Number of subscriber identities element.

6.5.3 INFORM-USER

The SS-FACILITY element for INFORM-USER shall have the following general format as shown in table 12:

Table 12: INFORM-USER contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0010_2	Distribution
Number of subscriber identities	4	1	M		
Subscriber identity		1	C		repeatable (note 1)
Definition type	2	1	M		
Services outside closed user group (note 2)	1	1	C	0	Restricted
				1	Not restricted
Service (note 2)		1	C		
Number of address strings (note 2)	4	1	C		
Address string (note 2)		1	C		repeatable (note 3)
Number of exceptions to address strings (note 2)	4	1	C		
Exception to address string (note 2)		1	C		repeatable (note 4)
Acknowledgement from affected user(s)	1	1	M	0	Ackn. requested
				1	Ackn. not requested

NOTE 1: Element shall be interpreted and shall appear as many times as indicated in the Number of subscriber identities element.
NOTE 2: Element shall be conditional on the element Definition type:
Addition, replacement: element shall be present;
Removal: element shall not be present.
NOTE 3: The element shall be repeated as many times as indicated in the element Number of address strings.
NOTE 4: The element shall be repeated as many times as indicated in the element Number of exceptions to address strings.

6.5.4 INFORM-USER-ACK

The SS-FACILITY element for INFORM-USER-ACK shall have the following general format as shown in table 13:

Table 13: INFORM-USER-ACK contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0010_2	Distribution
Number of subscriber identities	4	1	M		
Subscriber identity		1	C		repeatable (note)
Distribution result	3	1	M		

NOTE: Element shall be interpreted and shall appear as many times as indicated in the Number of subscriber identities element.

6.5.5 INTERROGATE

The SS-FACILITY element for INTERROGATE shall have the following general format as shown in table 14:

Table 14: INTERROGATE contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0011_2	Interrogation
Number of subscriber identities	4	1	M		
Subscriber identity		1	C		repeatable (note)
NOTE: Element shall be interpreted and shall appear as many times as indicated in the Number of subscriber identities element.					

6.5.6 INTERROGATE-ACK

The SS-FACILITY element for INTERROGATE-ACK shall have the following general format as shown in table 15:

Table 15: INTERROGATE-ACK contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0011_2	Interrogation
Number of subscriber identities	4	1	M		
Subscriber identity		1	C		repeatable (note 1)
Interrogation result	3	1	M		
Services outside closed user group (note 2)	1	1	C	0	Restricted
				1	Not restricted
Service (note 2)		1	C		
Number of address strings (note 2)	4	1	C		
Address string (note 2)		1	C		repeatable (note 3)
Number of exceptions to address strings (note 2)	4	1	C		
Exception to address string (note 2)		1	C		repeatable (note 4)
Delivery to affected user(s) (note 2)	1	1	C	0	Delivery requested
				1	Delivery requested
Acknowledgement from affected user(s) (note 2)	1	1	C	0	Ackn. requested
				1	Ackn. not requested
NOTE 1: Element shall be interpreted and shall appear as many times as indicated in the Number of subscriber identities element. NOTE 2: Element shall be conditional on the element Interrogation result: accepted; accepted, but definition sending to the affected user(s) pending in the SwMI; accepted, but negative ackn. received from affected user: element shall be present. any other value: element shall not be present. NOTE 3: The element shall be repeated as many times as indicated in the element Number of address strings. NOTE 4: The element shall be repeated as many times as indicated in the element Number of exceptions to address strings.					

6.5.7 CALL-BARRED

The SS-FACILITY element for CALL-BARRED shall have the following general format as shown in table 16:

Table 16: CALL-BARRED contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	000111_2	SS-BOC
Action Type	4	1	M	0111_2	Operation
Rejection cause	2	1	M		

6.5.8 Element coding

6.5.8.1 Action type

Action type shall indicate the type of the SS-BOC action as described in table 17.

Table 17: Action type contents

Element	Length	Value	Remark
Action type	4	0000_2	SS-Service not supported
		0001_2	Definition
		0010_2	Distribution
		0011_2	Interrogation
		0100_2	Cancellation
		0101_2	Invocation
		0110_2	Information
		0111_2	Operation
		1000_2	Deletion
		1001_2	Activation
		1010_2	Deactivation
		1011_2	Reserved
		...	etc.
		1111_2	Reserved

6.5.8.2 Address string

Address string element shall include the restricted address strings as described in table 18.

Table 18: Address string parameter contents

Parameter	Length	Type	C/O/M	Remark
Length of address string	4	1	M	
Digit	4	1	C	repeatable (note)
NOTE: The element is present as many times as indicated in the element Length of address string.				

6.5.8.3 Definition result

Definition result shall indicate whether the previously made definition request was successful or unsuccessful. Definition result element is described in table 19.

Table 19: Definition result contents

Element	Length	Value	Remark
Definition result	3	000_2	accepted by SwMI
		001_2	accepted, but definition values changed by SwMI
		010_2	request failed for any reason
		011_2	user not authorised
		100_2	unknown TETRA identity
		101_2	parameters not valid
		110_2	insufficient information
		111_2	Reserved

6.5.8.4 Definition type

Definition type shall indicate the type of the definition in relation to possible existing SS-BOC definition for the given subscriber identity or identities:

- 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 element is described in table 20.

Table 20: Subscriber number contents

Element	Length	Value	Remarks
Definition type	2	00_2	Addition
		01_2	Replacement
		10_2	Removal
		11_2	Reserved.

6.5.8.5 Digit

Digit shall indicate one number of the restricted address string. Digit element is described in table 21.

Table 21: Digit contents

Element	Length	Value	Remarks
Digit	4	0000_2	0
		0001_2	1
		0010_2	2
		...	etc.
		1001_2	9
		1010_2	Reserved
		1011_2	Reserved
		...	etc.
		1111_2	Reserved

6.5.8.6 Distribution result

Distribution result shall indicate whether the previously made distribution of definitions to affected user(s) was successful or unsuccessful. Distribution result element is described in table 22.

Table 22: Distribution result contents

Element	Length	Value	Remark
Distribution result	3	000_2	successfully received by MS/LS
		001_2	request failed for any reason
		010_2	user not authorised
		011_2	unknown TETRA identity
		100_2	parameters not valid
		101_2	insufficient information
		110_2	Reserved
		111_2	Reserved

6.5.8.7 Exception to address string

As Address string.

6.5.8.8 Interrogation result

Interrogation result shall indicate whether the previously made interrogation request was successful or unsuccessful. Interrogation result element is described in table 23.

Table 23: Interrogation result contents

Element	Length	Value	Remark
Interrogation result	3	000_2	accepted
		001_2	accepted, but definition sending to the affected. user(s) pending in the SwMI (note)
		010_2	accepted, but negative ackn. received form affected user (note)
		011_2	request failed for any reason
		100_2	user not authorised
		101_2	unknown TETRA identity
		110_2	parameters not valid
		111_2	insufficient information
NOTE: The result is also applicable for affected users.			

6.5.8.9 Length of address string

Length of address string shall indicate how many digits there are in the address string. The element is described in table 24.

Table 24: Length of address string contents

Element	Length	Value	Remarks
Length of address string	4	0000_2	1 digit
		0001_2	2 digits
		0010_2	3 digits
		...	etc.
		1111_2	16 digits
NOTE: The number in Remark column indicates how many Digit elements shall be present.			

6.5.8.10 Number of address strings

Number of address strings shall indicate how many Address string elements is following the element. Number of address strings element is described in table 25.

Table 25: Number of address strings identities contents

Element	Length	Value	Remarks
Number of address strings	4	0000_2	0 Address string element
		0001_2	1 Address string elements
		0010_2	2 Address string elements
		...etc.	...etc.
		1001_2	10 Address string elements
		1010_2	Reserved
		...	etc.
		1111_2	Reserved
NOTE: The number in Remark column indicates how many Address string elements shall be present.			

6.5.8.11 Number of exceptions to address strings

As Number of address strings.

6.5.8.12 Number of service(s)

Number of service(s) shall indicate how many service elements are present and follow this element in the PDU. Number of service(s) element is described in table 26.

Table 26: Number of service(s) contents

Element	Length	Value	Remarks
Number of service(s)	3	000_2	0
		001_2	1
		010_2	2
		011_2	3
		100_2	4
		101_2	Reserved.
		...	etc.
		111_2	Reserved.

6.5.8.13 Number of subscriber identities

Number of subscriber identities shall indicate, if the following subscriber identity or identities shall be one identity, range of identities or a list of identities. The element shall also indicate how many Subscriber identity elements is following.

All the definition or interrogation elements following the listed subscriber identities given in the PDU, shall be applicable to all the subscriber identities.

Number of subscriber identities is described in table 27.

Table 27: Number of subscriber identities contents

Element	Length	Value	Remarks
Number of subscriber identities	4	0000_2	Subscriber identity, 1
		0001_2	Range of subscriber identities, 2
		0010_2	List of subscriber identities, 2
		0011_2	List of subscriber identities, 3
		0100_2	List of subscriber identities, 4
		0101_2	List of subscriber identities, 5
		0110_2	List of subscriber identities, 6
		0111_2	List of subscriber identities, 7
		1000_2	List of subscriber identities, 8
		1001_2	List of subscriber identities, 9
		1010_2	List of subscriber identities, 10
		1011_2	Reserved
		...	etc.
		1111_2	Reserved
NOTE: The number in Remark column indicates how many Subscriber number elements shall be present.			

6.5.8.14 Rejection cause

Rejection cause shall indicate the reason for the barring as described in table 28.

Table 28: Rejection cause 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

6.5.8.15 Service

Service element shall list all the circuit mode and/or packet mode data services to which the definition is applicable as described in table 29.

Table 29: Service parameter contents

Element	Length	Type	C/O/M	Remark
Number of services	3	2	C	
Service type		2	C	repeatable (note)
NOTE: The element is present as many times as indicated in the element Number of services.				

6.5.8.16 Service type

Service type shall indicate the applicable service type, e.g. circuit mode speech service. Service type element is described in table 30.

Table 30: Service type contents

Element	Length	Value	Remarks
Service type	3	000_2	All applicable services (note)
		001_2	Circuit mode speech service
		010_2	Circuit mode data service
		011_2	Connectionless packet mode data service
		100_2	Connection-oriented packet mode data service
		101_2	Reserved.
		...	etc.
		111_2	Reserved.
NOTE: All applicable services correspond to all services listed in this table.			

6.5.8.17 Subscriber identity

Subscriber identity shall define a TSI of the restricted identity. Subscriber identity element is described in table 31.

Table 31: Subscriber identity contents

Element	Length	Value	Remark
SSI	24		See ETS 300 392-1 [2] clause 7.
MCC	10		See ETS 300 392-1 [2] clause 7.
MNC	14		See ETS 300 392-1 [2] clause 7.

7 SS-BOC FE behaviour

The figures contained in this clause are intended to illustrate typical SS-BOC specific FE behaviour in terms of information flows sent and received.

NOTE: The intention of the figures in this clause is to describe the functionality of SS-BOC and the call related information flows are not complete, e.g. all the call set-up or call release primitives and PDUs are not included in the figures.

The behaviour of each FE is shown using the (Functional) Specification and Description Language defined in CCITT Recommendation Z.100 [5]. Notice, however, that due to simplicity there are deviations from syntactical rules.

The convention used in the figures below is that output signals to the left represent information flows towards the user and output signals to the right represents information flows towards the SwMI part of the BOC function. Input signals from the left represent information from the user and input signals from the right represent information flows from the central part of the SwMI.

FEx, where x is 1,2,3,..., refers to a block and FE_x refers to a process in the figures below.

7.1 Behaviour of FE1

7.1.1 Service interaction for FE1

Service interaction for FE1 is shown in figure 6.

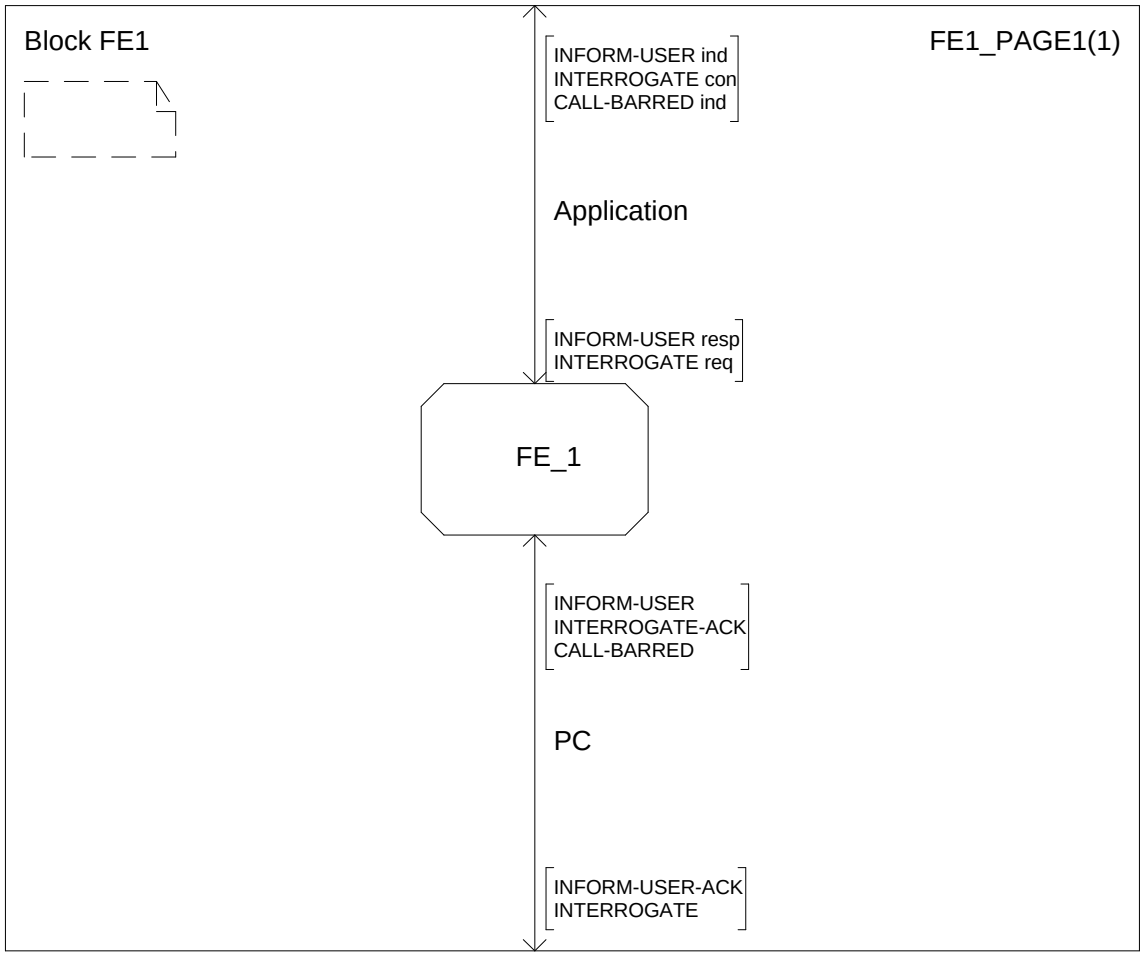


Figure 6: Service interaction for FE1

7.1.2 Process description for FE1

Process description of FE1 is shown in figure 7.

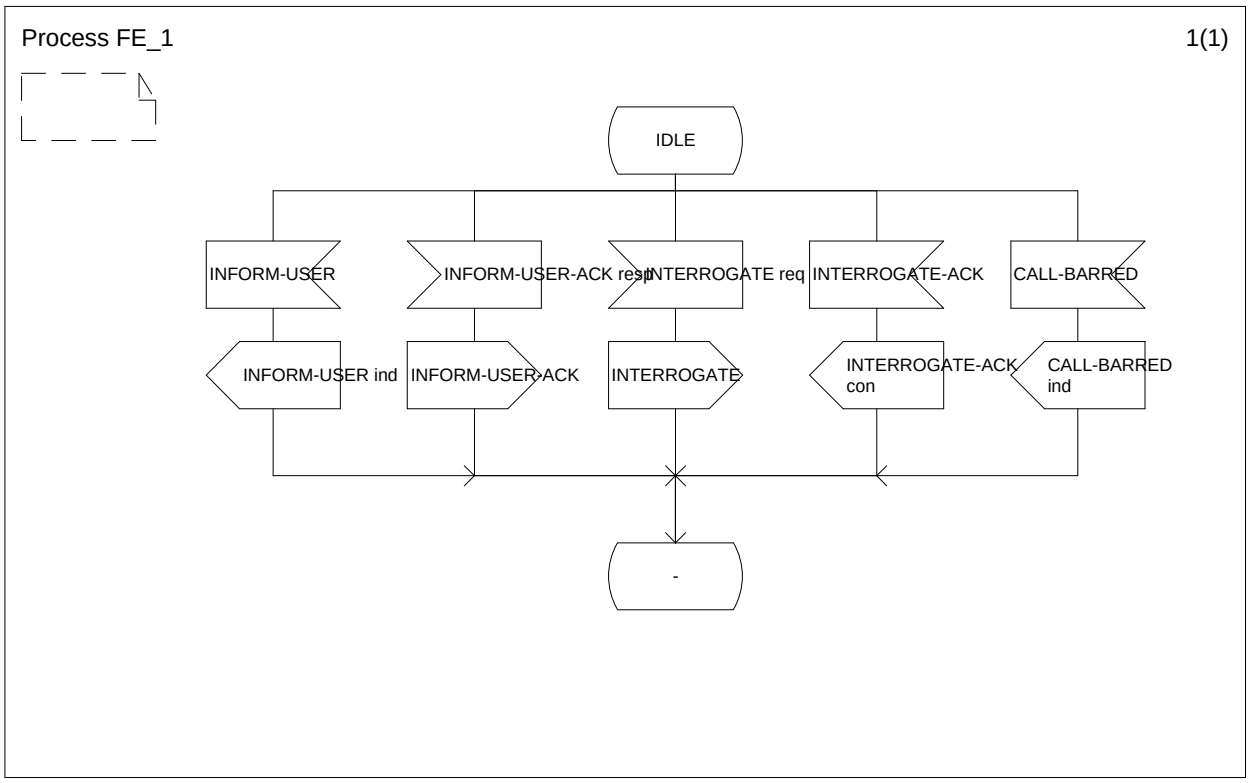


Figure 7: Process description for FE1

7.2 Behaviour of CCA to which FE1 is collocated

7.2.1 Process description for CCA to which FE1 is collocated

Process description of CCA to which FE1 is collocated is shown in figure 8.

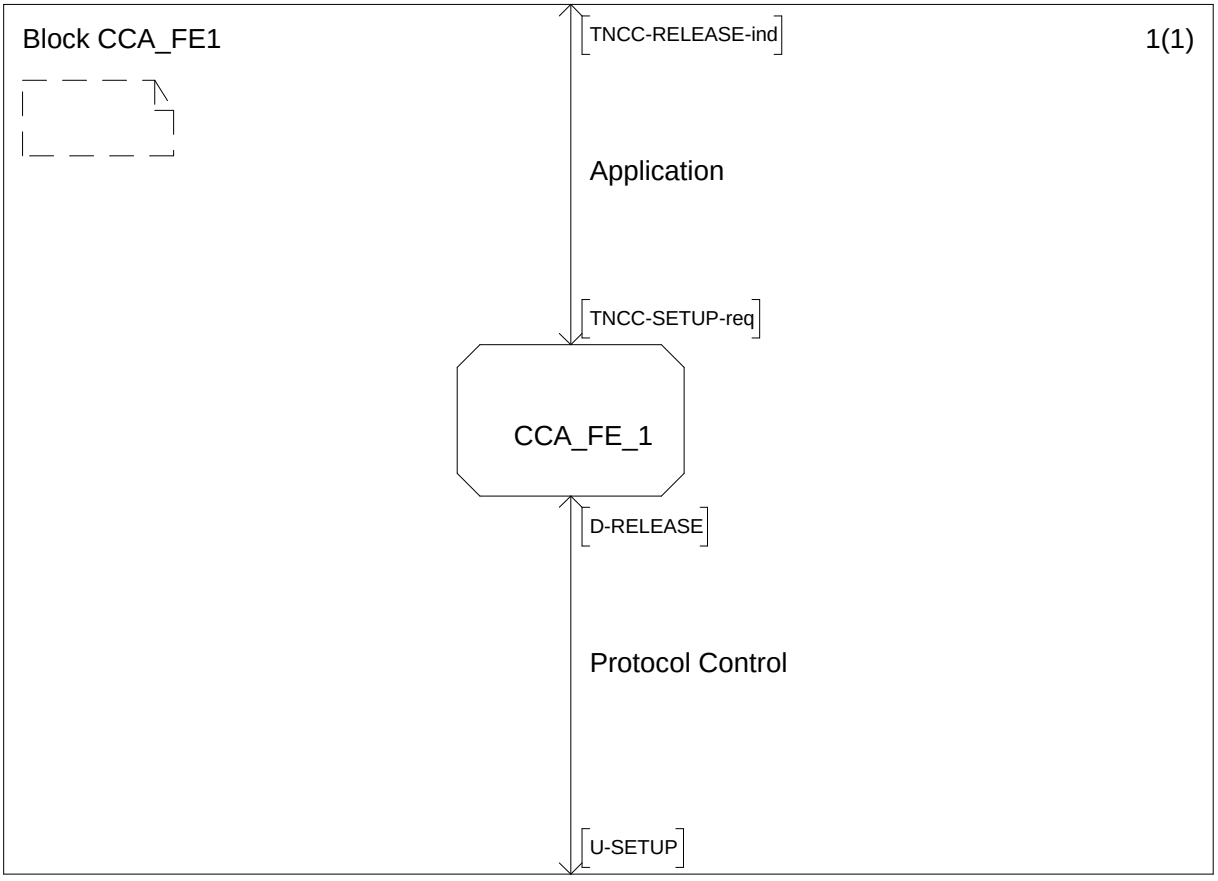


Figure 8: Service interaction for CCA to which FE1 is collocated

7.2.2 Service interaction for CCA to which FE1 is collocated

Service interaction for CCA to which FE1 is collocated is shown in figure 9.

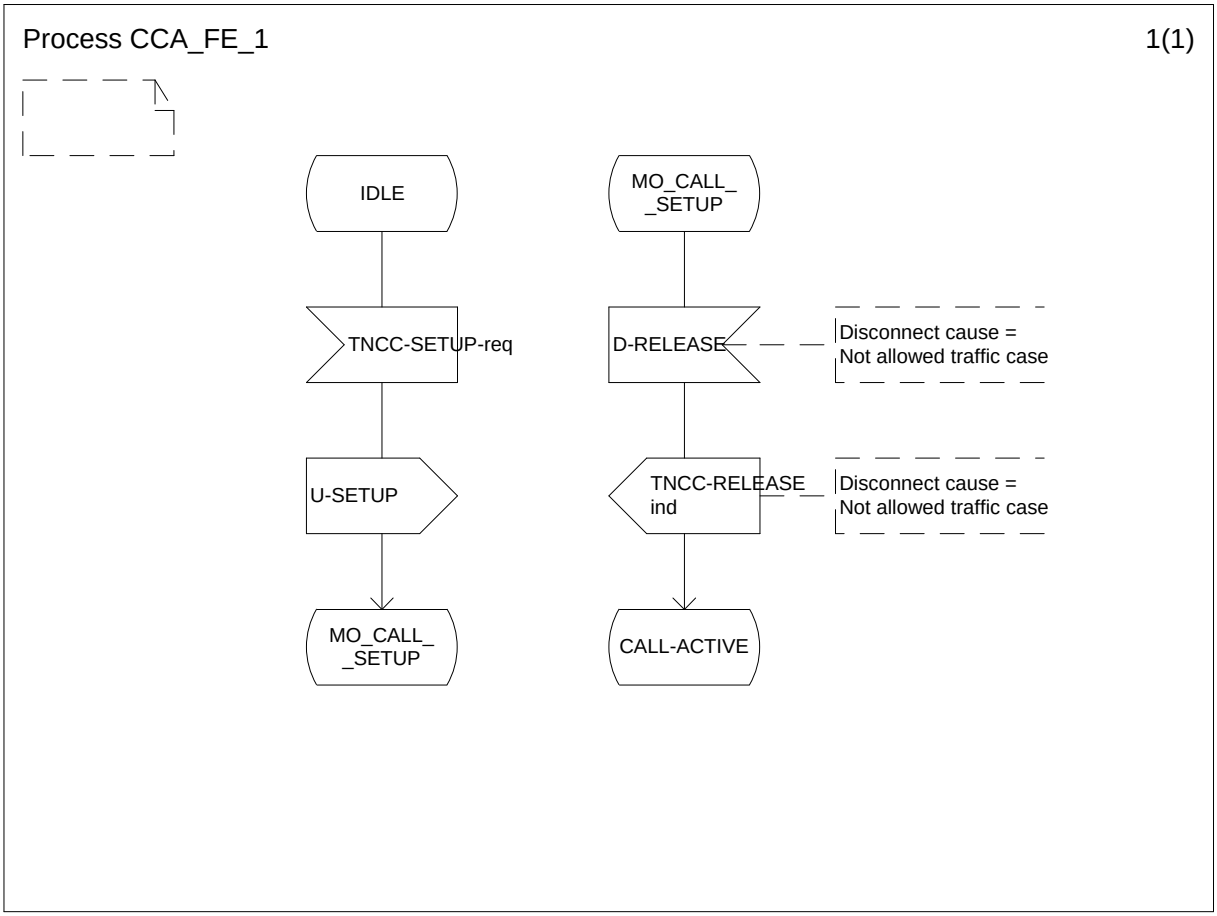


Figure 9: CCA to which FE1 is collocated

7.3 Behaviour of FE2

7.3.1 Service interaction for FE2

Service interaction for FE1 is shown in figure 10.

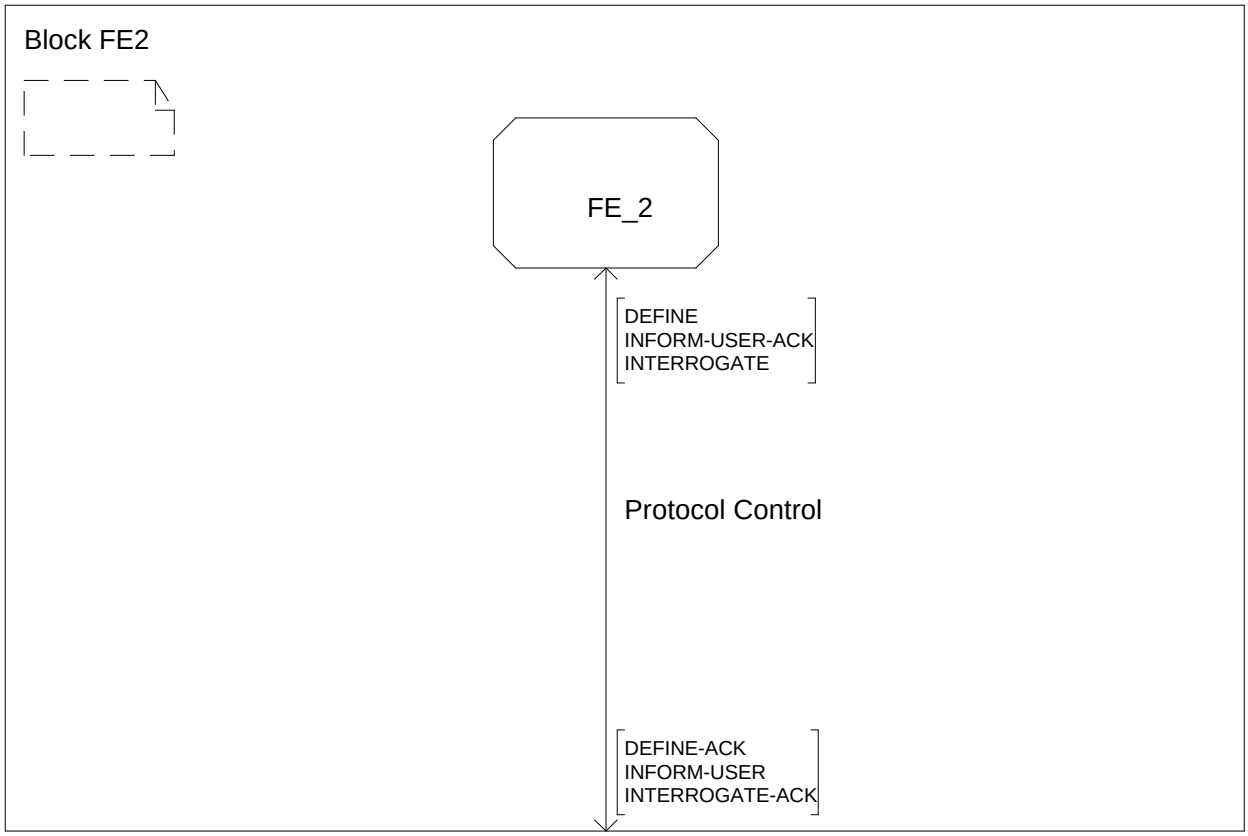


Figure 10: Service interaction for FE2

7.3.2 Process description for FE2

Process descriptions for FE2 state IDLE and WAIT-FOR-ACK is shown in figures 11 and 12.

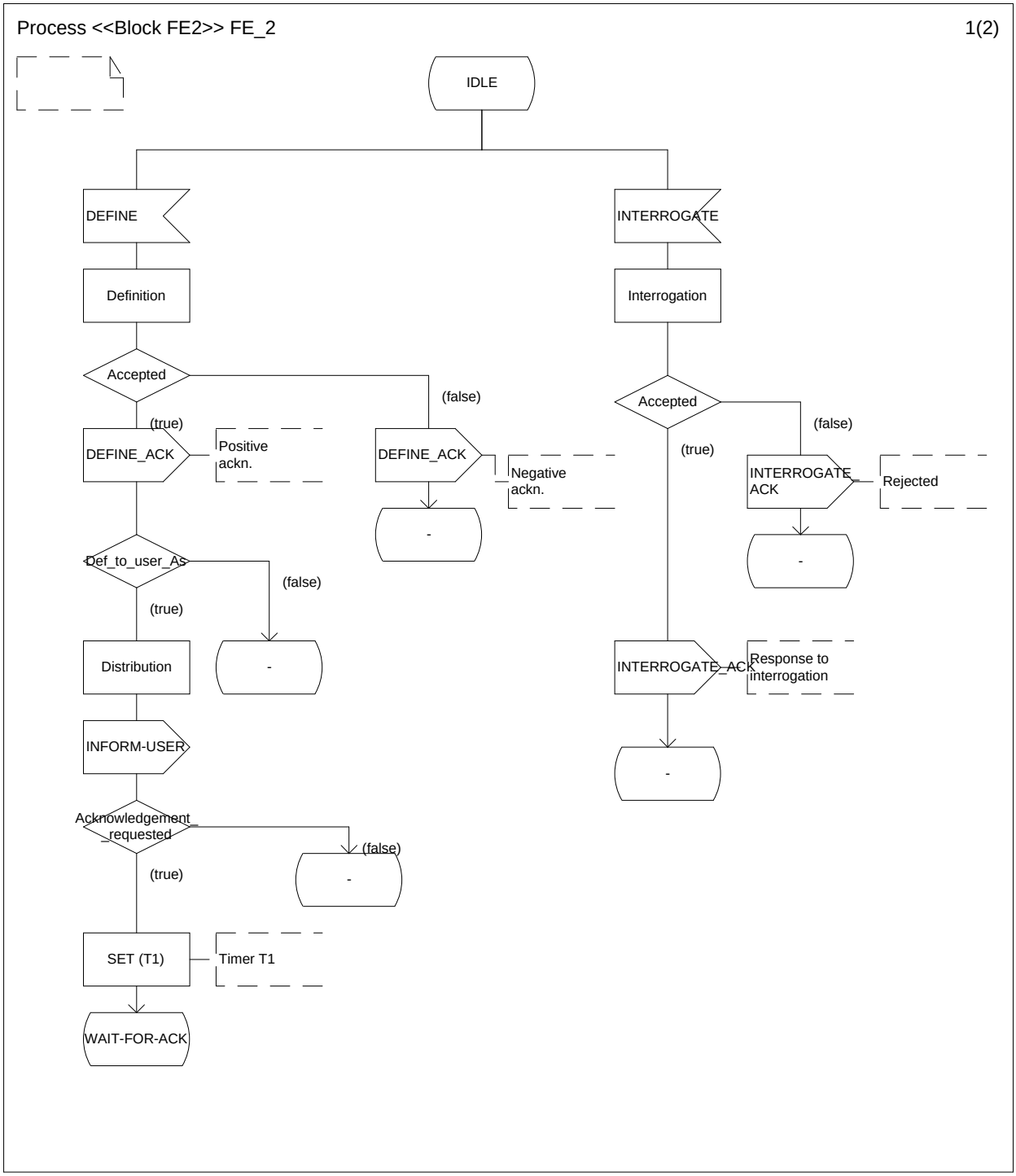


Figure 11: Process description for FE2 state IDLE

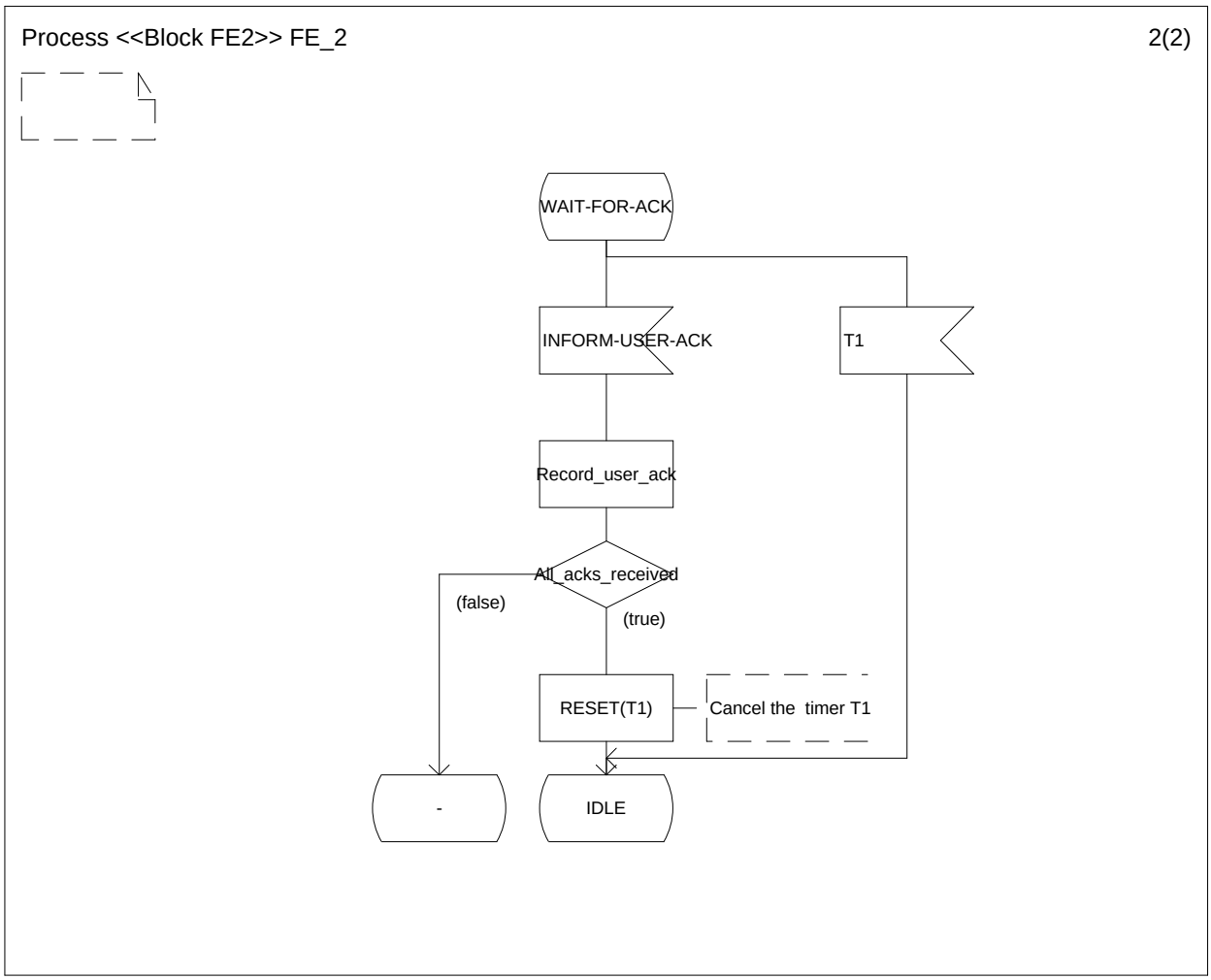


Figure 12: Process description for FE2 state WAIT-FOR-ACK

7.4 Behaviour of CC to which FE2 is collocated

7.4.1 Service interaction for CC to which FE2 is collocated

Service interaction for CC to which FE2 is collocated is shown in figure 13.

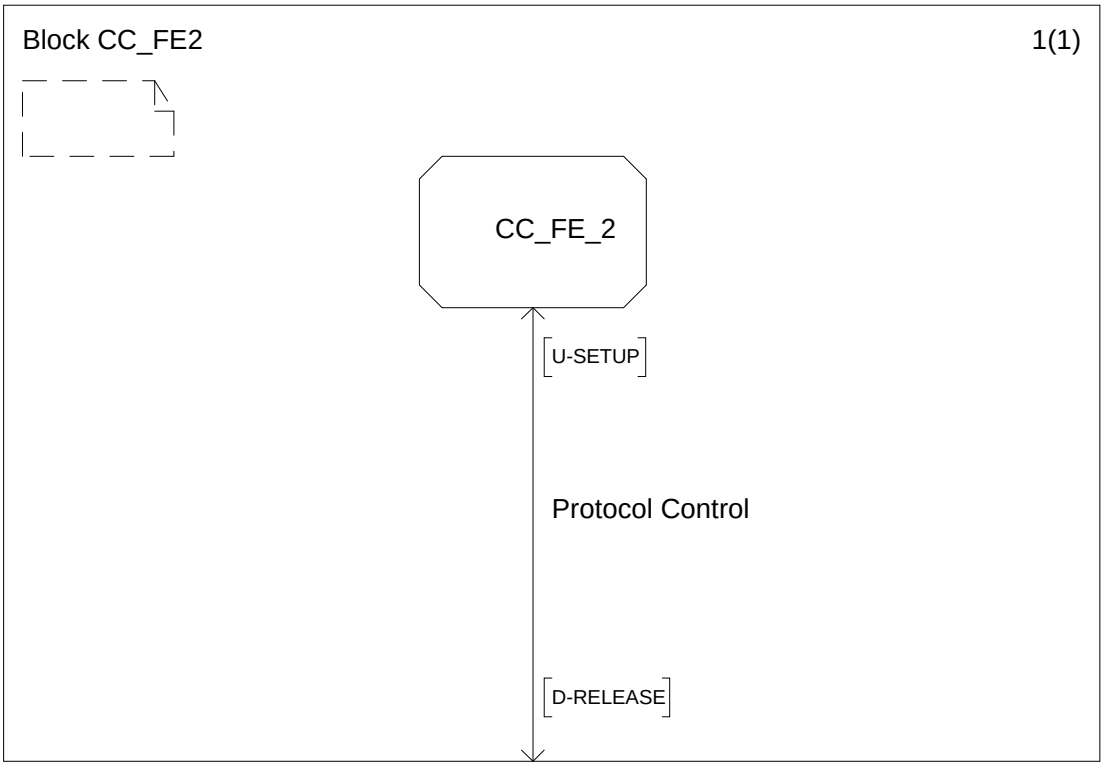


Figure 13: Service interaction for CC to which FE2 is collocated

7.4.2 Process description for CC to which FE2 is collocated

Process description for CC to which FE2 is collocated is shown in figure 14.

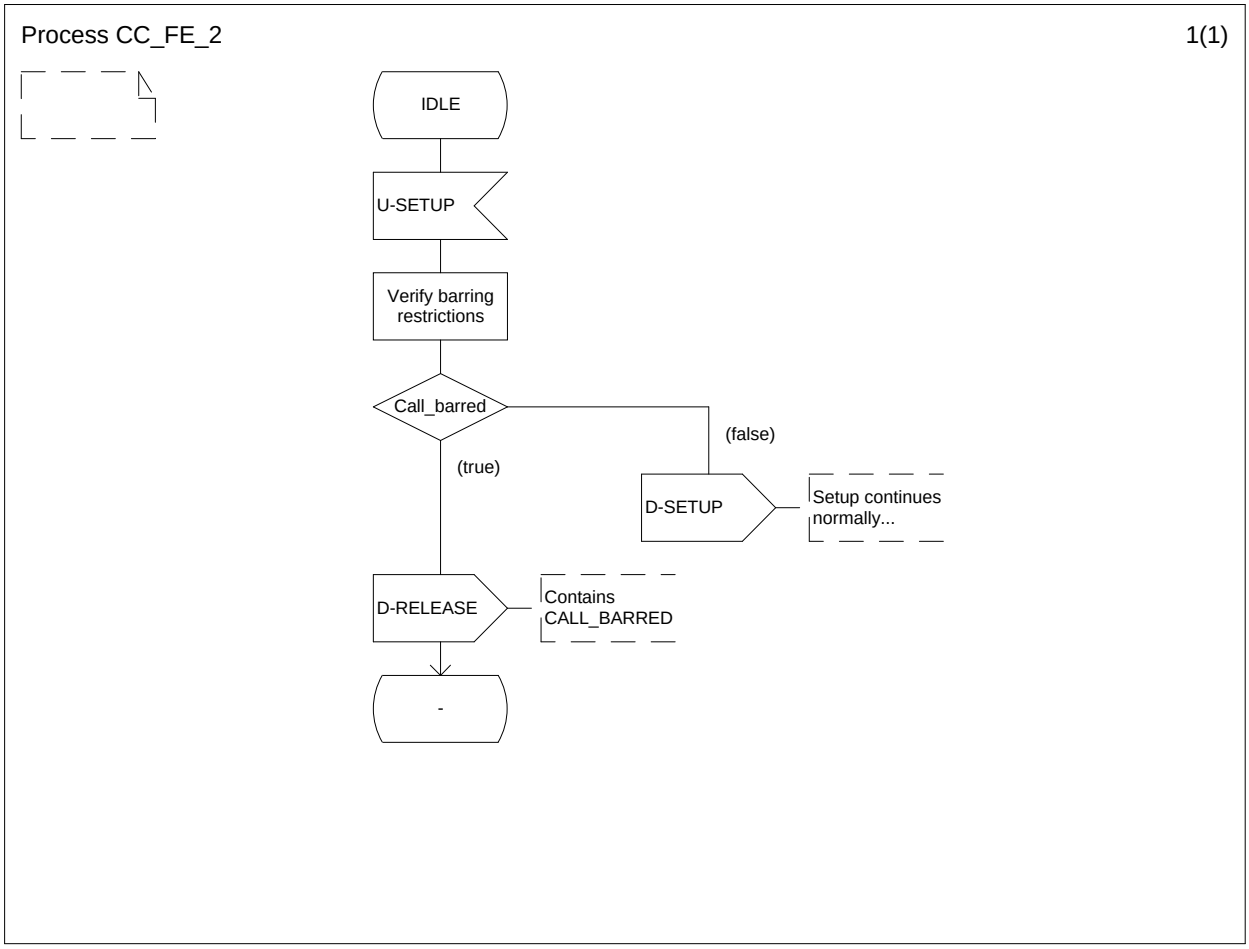


Figure 14: Process description for CC to which FE2 is collocated

7.5 Behaviour of FE3

7.5.1 Service interaction for FE3

Service interaction for FE3 is shown in figure 15.

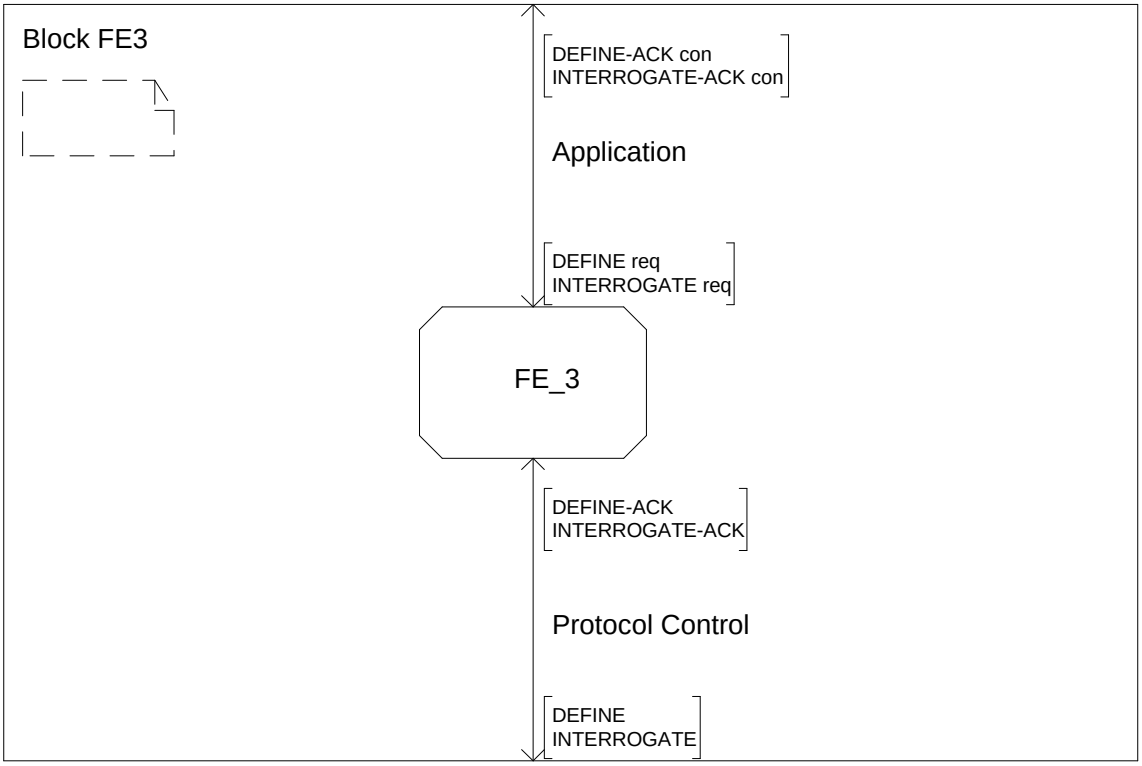


Figure 15: Service interaction for FE3

7.5.2 Process description for FE3

Process description of FE3 is shown in figure 16.

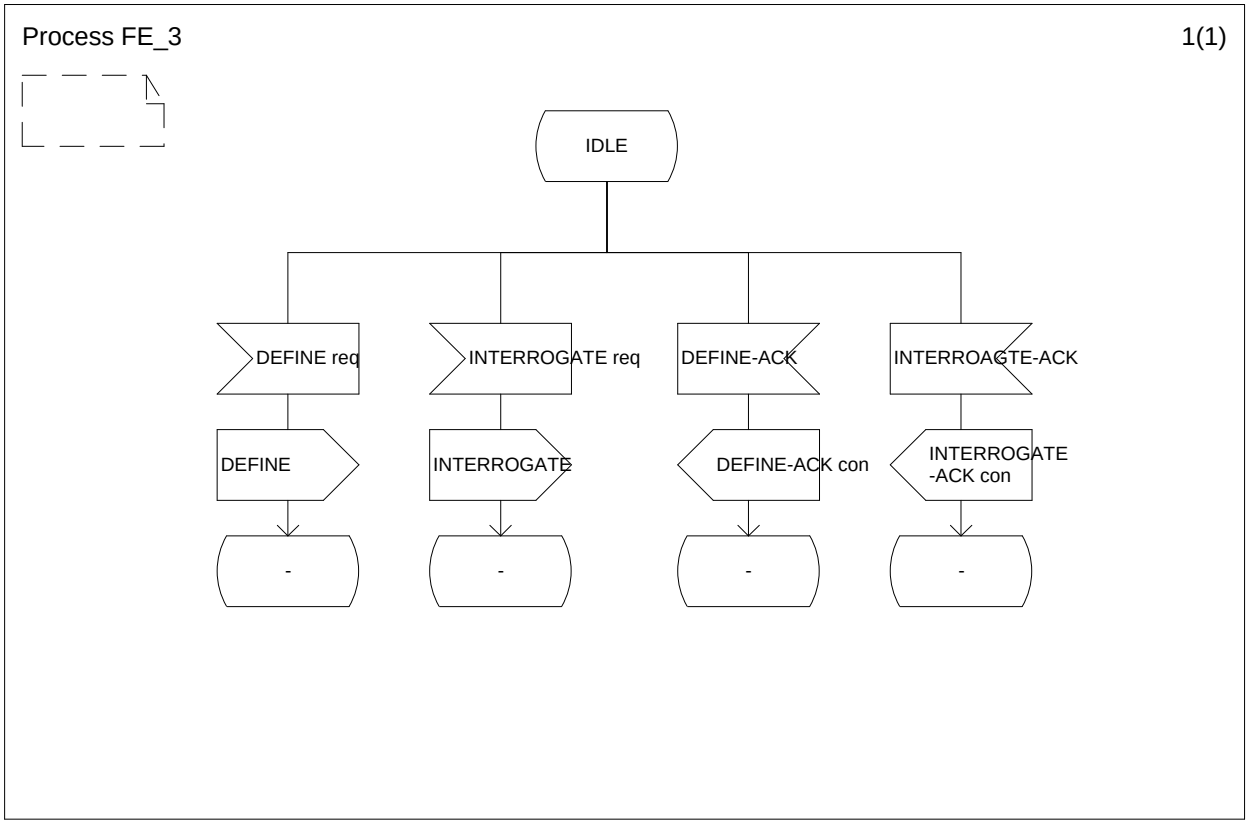


Figure 16: Process description for FE3

7.6 Behaviour of FE4

7.6.1 Service interaction for FE4

Service interaction for FE4 is shown in figure 17.

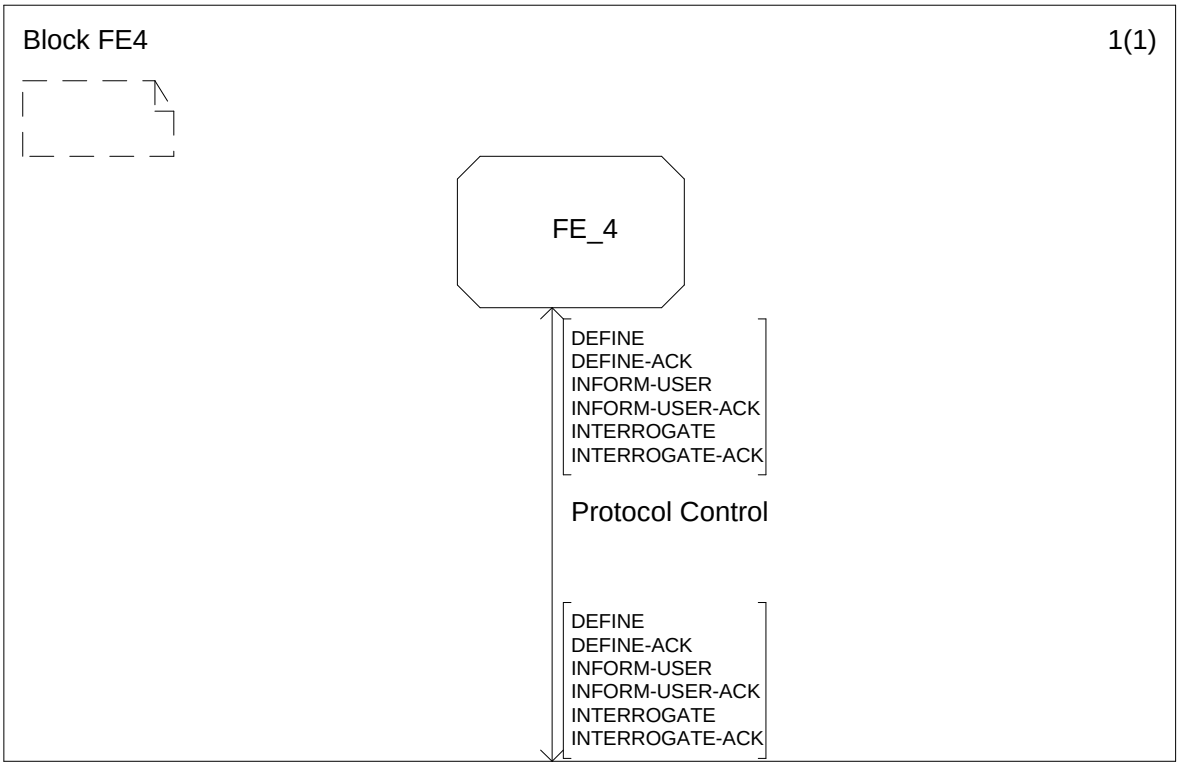


Figure 17: Service interaction for FE4

7.6.2 Process description for FE4

Process description for FE4 is shown in figure 18.

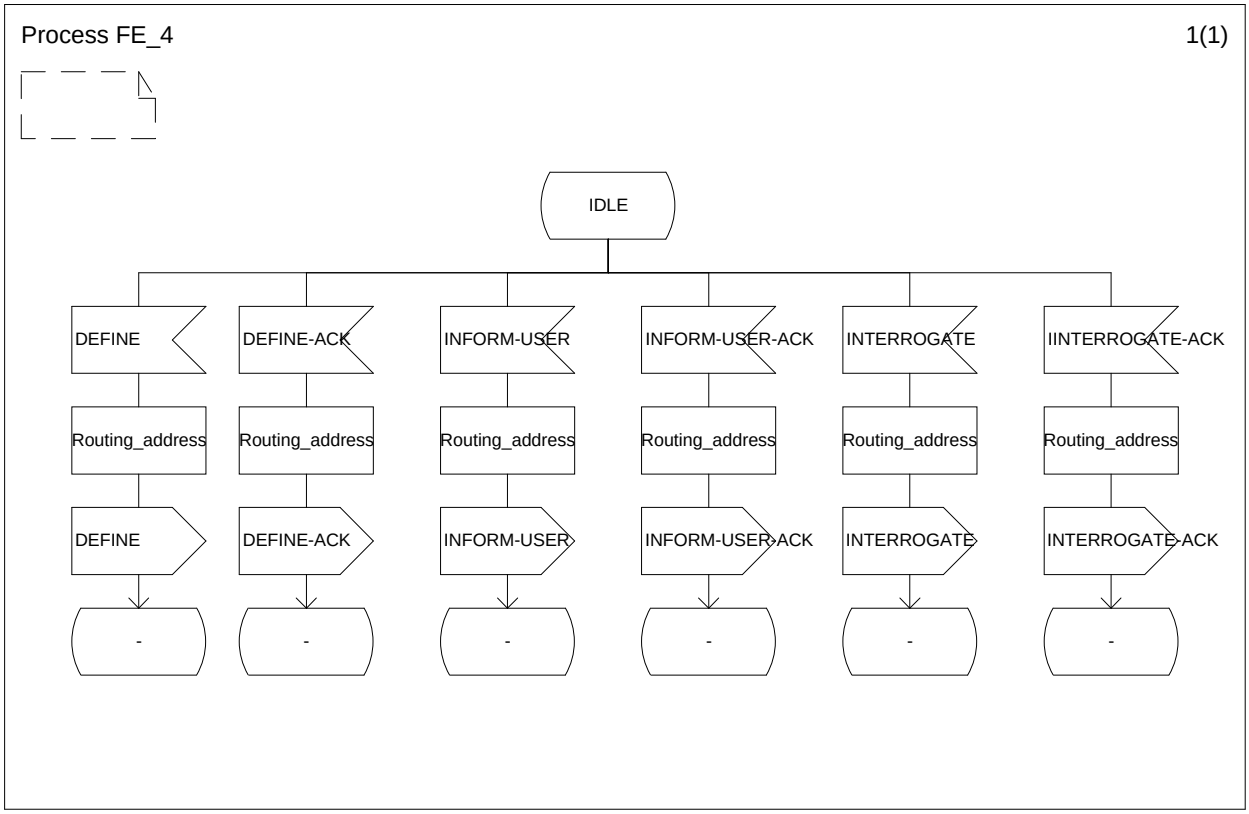


Figure 18: Process description for FE4

History

Document history			
December 1996	Public Enquiry	PE 120:	1996-12-16 to 1997-04-11