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*European Standard (Telecommunications series)*

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

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# Contents

Intellectual Property Rights .....	4
Foreword.....	4
1 Scope.....	6
2 References.....	6
3 Definitions and abbreviations.....	7
3.1 Definitions.....	7
3.2 Abbreviations.....	7
4 Functional model.....	7
4.1 Functional model description.....	7
4.2 Description of FEs.....	8
4.2.1 Affected user's FE, FE1.....	8
4.2.2 SS-BIC FE in SwMI, FE2.....	9
4.2.3 Authorized user's FE, FE3.....	9
4.2.4 SS-BIC FE2 in visited SwMI.....	9
4.2.5 Calling party's FE, FE5.....	9
4.3 Relationship with a basic and a packet data service.....	10
5 Information flows.....	10
5.1 Void.....	10
5.2 Definition of information flows.....	10
5.2.1 Definition.....	10
5.2.1.1 DEFINE and DEFINE EXTERNAL.....	11
5.2.1.2 DEFINE ACK.....	12
5.2.1.3 DEFINE/DEFINE EXTERNAL USER.....	13
5.2.1.4 DEFINE USER ACK.....	13
5.2.2 Interrogation.....	14
5.2.2.1 INTERROGATE.....	14
5.2.2.2 INTERROGATE ACK.....	14
5.2.3 Operation.....	15
5.2.3.1 CALL BARRED.....	16
5.3 Service primitives.....	16
5.4 Information flow sequences.....	17
5.4.1 Definition.....	17
5.4.2 Definition over ISI.....	18
5.4.3 Interrogation.....	19
5.4.4 Interrogation over ISI.....	19
5.4.5 Operation.....	20
5.4.6 Operation of SS-BIC when the service is barred through ISI.....	20
5.5 FE actions.....	20
5.5.1 FE actions of FE1.....	20
5.5.2 FE actions of FE2.....	21
5.5.3 FE actions of FE3.....	21
5.5.4 FE actions of visited SwMI FE2.....	21
5.5.5 FE actions of FE5.....	21
6 Allocation of FEs to physical equipment.....	22
7 Inter-working considerations.....	22
History.....	23

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## 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 300 392-11-19. During the processing for Vote it was converted into an EN.

The present document is part 11, 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".

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# 1 Scope

The present document defines the stage 2 specification of the Supplementary Service Barring of Incoming Calls (SS-BIC) for the Terrestrial Trunked Radio (TETRA) as provided by European operators.

SS-BIC 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 the ISI to several TETRA systems.

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

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

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

Aspects relating to all supplementary services are detailed in EN 300 392-9 [5].

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# 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 EN 300 392-12-19: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 19: Barring of Incoming Calls (BIC)".
- [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".

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## 3 Definitions and abbreviations

### 3.1 Definitions

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

**affected user:** user whose incoming services are barred

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

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

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

### 3.2 Abbreviations

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

CC	Call Control functional entity
CCA	Call Control functional entity Agent
FE	Functional Entity
ISI	Inter-System Interface
LS	Line Station
MS	Mobile Station
SS-BIC	Supplementary Service Barring of Incoming Calls
SwMI	Switching and Management Infrastructure
TETRA	Terrestrial Trunked Radio
V+D	Voice plus Data

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## 4 Functional model

### 4.1 Functional model description

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

FE1 affected user's FE for SS-BIC in MS/LS;

FE2 SS-BIC FE in SwMIs;

FE3 authorized party's FE for SS-BIC in MS/LS;

FE5 calling party's FE for SS-BIC in MS/LS;

CC call control functional entity in SwMI;

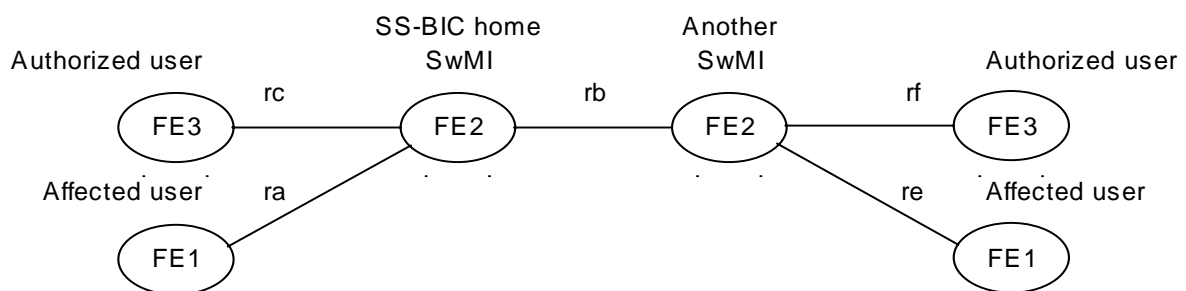
CCA call control functional entity agent in MS/LS.

NOTE: CC/CCA refers to any basic service sub-entity or packet mode data service entity, which is used in conjunction with SS-BIC.

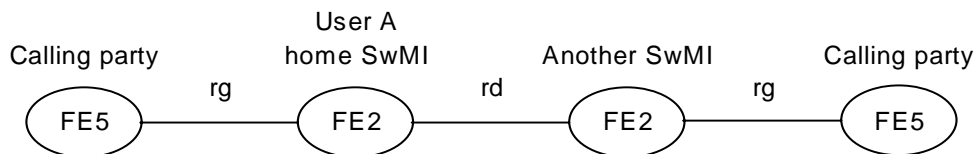
The following relationships shall exist between these FEs:

- ra between FE1 and FE2;
- rb between FE2s in different TETRA systems for management;
- rc between FE2 and FE3;
- rd between FE2s in different TETRA systems for operation;
- re between FE1 and visited SwMI FE2;
- rf between FE3 and visited SwMI FE2;
- rg between FE2 and FE5.

Figures 1 and 2 show 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: FE1 does not receive any information of the barring.

**Figure 2: Functional model for the operational part**

## 4.2 Description of FEs

### 4.2.1 Affected user's FE, FE1

The functional tasks of FE1 shall be the following:

- upon reception of an SS-BIC definition indication from the SwMI, FE1 shall inform the user application;
- upon reception of an SS-BIC interrogation request from the user, FE1 shall send the interrogation request to the SwMI;
- upon reception of an SS-BIC interrogation response from the SwMI, FE1 shall inform the user of the response.



## 4.2.2 SS-BIC FE in SwMI, FE2

The functional tasks of FE2 shall be the following in the home system of the restricted identity:

- upon reception of an SS-BIC definition request from FE3, FE2 shall save the definition in the SwMI and acknowledge the request to FE3. FE2 shall send the SS-BIC definition indication(s) to FE1(s), if requested by FE3 in the definition request;
- upon reception of an SS-BIC interrogation request from FE1 or FE3, FE2 shall send the interrogation response to FE1 or FE3 respectively;
- upon reception of an incoming basic or packet data service request to FE1, for which the SS-BIC restrictions apply, FE2 shall bar the request and inform FE5 about the barring.

The functional tasks of FE2 shall be the following in the visited system of the restricted identity:

- upon reception of an SS-BIC interrogation request from FE1 or FE3, FE2 shall send the interrogation response to FE1 or FE3 respectively, if the visited system knows the SS-BIC definition;
- upon reception of an incoming basic or packet data service request to FE1, for which the SS-BIC restrictions apply, FE2 shall bar the request and inform FE5 about the barring, if the visited system knows the SS-BIC definition;
- upon reception of an incoming basic or packet data service request to FE1, FE2 may send the service request to the home system and bar the call if indicated by the home system. FE2 shall inform FE5 about the barring of the service.

## 4.2.3 Authorized user's FE, FE3

The functional tasks of FE3 shall be the following:

- upon reception of an SS-BIC definition request from the user, FE3 shall send the request to the SwMI;
- upon reception of an SS-BIC definition acknowledgement from the SwMI, FE3 shall inform the user of the acknowledgement;
- upon reception of an SS-BIC interrogation request from the user, FE3 shall send the request to the SwMI;
- upon reception of an SS-BIC interrogation response from the SwMI, FE3 shall inform the user of the response.

## 4.2.4 SS-BIC FE2 in visited SwMI

The visited SwMI FE2 shall have perform the following tasks, refer EN 300 392-9 [5]:

- upon reception of an SS-BIC information flow over the ISI from home SwMI FE2 to FE1 or to FE3, the visited SwMI FE2 shall transport the flow to FE1 or to FE3 respectively;
- upon reception of an SS-BIC information flow from FE1 or from FE3 to home SwMI FE2, the visited SwMI FE2 shall transport the flow over the ISI to the home SwMI FE2.

## 4.2.5 Calling party's FE, FE5

Upon reception of a barred basic or packet data service from the SwMI, FE5 shall inform the user of the barring.

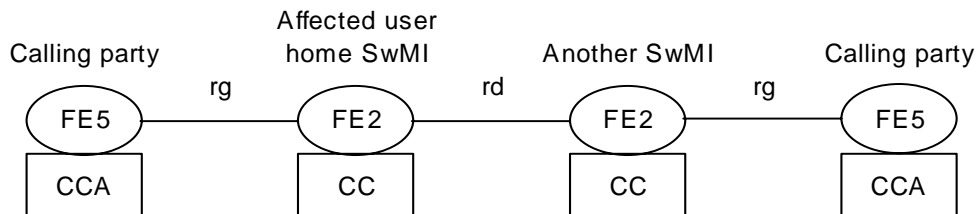
## 4.3 Relationship with a basic and a packet data service

FE2 shall be collocated to CC in the SwMI.

FE5 shall be collocated to CCA.

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

NOTE: Call control has no relationship with the packet data service.



NOTE 1: FE1 does not receive any information of the barring.

NOTE 2: In the SS-BIC each calling party FE5 is operated independently although shown in a single relationships figure.

**Figure 3: Relationships with FEs and CCs/CCAs**

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## 5 Information flows

### 5.1 Void

### 5.2 Definition of information flows

In the tables listing the service elements in information flows, the column header "Type" indicates which of the service elements are Mandatory (M), Conditional (C) or Optional (O). If type is conditional, the conditions are stated.

The listed service elements shall specify whether the information of each element is included in the flow.

NOTE: It is possible that there is not a one-to-one mapping between a service element and Protocol Data Unit (PDU) or primitive elements described in EN 300 392-12-19 [2].

#### 5.2.1 Definition

The authorized user shall be able to define barring restrictions on affected user's behalf. The SS-BIC definitions shall restrict incoming services.

One restricted identity shall refer to either an individual subscriber identity or to a group identity. The authorized user shall only be allowed to define SS-BIC for subscriber identities which home system is the same as the authorized user's home system.

One definition request shall be made to restrict:

- one subscriber identity;
- a range of subscriber identities; or
- a list of subscriber identities.

The different barring restrictions shall comprise of one or more of the following:

- all incoming services from outside closed user groups;
- all or certain incoming service types;
- restricted source addresses for incoming services.

The definition may contain exceptions to the barred incoming service addresses.

The authorized user may request the SwMI to send the SS-BIC definition to the affected user for information.

The SS-BIC definition made for an individual subscriber should be sent over the ISI as part of the mobility management functions, when the subscriber migrates to the system.

NOTE 1: It is possible that a TETRA system is not able to receive the SS-BIC definitions over the ISI.

NOTE 2: It is possible that a TETRA system uses other mechanisms to determine the incoming service restrictions for migrated subscribers within the system. These mechanisms are outside the scope of the present document.

The SS-BIC definition made for a group should be sent over the ISI to each TETRA system that supports the group call when the definition is made.

NOTE 3: The SS-BIC definition of the group may be sent over the ISI as part of the mobility management function of a subscriber when the subscriber migrates to the system. The SS-BIC definition may be transported at migration e.g. if a group call is supported in a system depending on if a member of the group is located in the system.

NOTE 4: It is possible that a TETRA system is not able to receive the SS-BIC definitions over the ISI.

#### 5.2.1.1 DEFINE and DEFINE EXTERNAL

The DEFINE and DEFINE EXTERNAL information flows shall be applied for the relationship rc and it shall be sent from FE3 to FE2. The flow shall also be applicable for the relationship rf and rb and it shall be sent from FE3 to home SwMI FE2 via visited SwMI FE2, if FE3 is in visited system.

If any of the given restrictions apply, the basic service is barred.

FE3 shall send the request to define SS-BIC to the SwMI for the given subscriber identity or identities.

The contents of the information flows are shown in table 1.

**Table 1: Contents of DEFINE and DEFINE EXTERNAL information flows**

Element	Type
Defining authorized user	M
Restricted subscriber identity(ies)	M, note 1
Incoming services outside closed user groups restricted	C, note 2
Restricted incoming service types	C, notes 2 and 3
Restricted source address list	C, notes 2, 4 and 8
Exceptions to restricted source address list	O, notes 5, 8 and 9
Definition sent to affected user(s)	M, note 6
Acknowledgement from affected users	M, note 7
NOTE 1: The element specifies the TETRA subscriber identity(ies) on which behalf the SS-BIC definition is made. One subscriber identity, a range or set of subscriber identities are given.	
NOTE 2: At least one of the following elements shall be given in the definition request: <ul style="list-style-type: none"> <li>- incoming services outside closed user group restricted;</li> <li>- restricted incoming service types;</li> <li>- restricted source address list.</li> </ul>	
NOTE 3: The element indicates the restricted service types.	
NOTE 4: The element is a list of restricted source addresses for incoming services. A restricted address comprises of a variable-length digit string. A service requested by subscriber, which address starts with the restricted digit string, shall be barred.	
NOTE 5: The element is a list of exceptions to the restricted source addresses for incoming services. A restricted address comprises of a variable-length digit string. If the digit string for exception source address is longer than the restricted source address, the exception source address overrides and the requested service is allowed.	
NOTE 6: The element indicates if the SS-BIC definition indication is sent to the affected user(s) for information. If the restricted identity is a group, the affected users are the members of the group.	
NOTE 7: The element indicates if the affected user(s) is requested to acknowledge the reception of the definition indication.	
NOTE 8: <ul style="list-style-type: none"> <li>- TETRA identities will be used both for restricted and allowed numbers.</li> <li>- Variable length digit string will be used for external network addresses.</li> <li>- IP addresses for Internet restrictions.</li> <li>- Closed user groups will be identified by a 16 bits long identifier.</li> </ul>	
NOTE 9: Address exceptions: <ul style="list-style-type: none"> <li>- allowed source identities will be used to override otherwise forbidden identities or external network addresses.</li> </ul>	

### 5.2.1.2 DEFINE ACK

The DEFINE ACK information flow shall be applied for the relationship rc and shall be sent from FE2 to FE3. The flows shall also be applicable for the relationship rb and rf and it shall be sent from home SwMI FE2 to FE3 via visited SwMI FE2, if FE3 is in visited SwMI.

FE2 shall send the flow to acknowledge the SS-BIC definition requests as response to DEFINE and DEFINE EXTERNAL information flows.

NOTE: The Definition result element does not give information whether the affected users have been successfully informed; the interrogation is used to request this, if needed.

The contents of the information flow are shown in table 2.

**Table 2: Contents of DEFINE ACK information flow**

Element	Type
Restricted subscriber identity(ies)	M
Definition result	M, note
NOTE: This element indicates the definition result: <ul style="list-style-type: none"> <li>- defined;</li> <li>- not defined and the applicable error code.</li> </ul>	

### 5.2.1.3 DEFINE/DEFINE EXTERNAL USER

The optional DEFINE/DEFINE EXTERNAL USER information flow shall be applied for the relationship ra and shall be sent from FE2 to FE1. The flow shall also be applicable for the relationship rb and re and it shall be sent from home SwMI FE2 to FE1 via visited SwMI FE2, if FE1 is in visited SwMI.

FE2 shall send the flow to inform affected user(s) of the SS-BIC definition. FE2 shall send the information flow, if requested by the authorized user, see table 1 Definition sent to affected user(s).

The contents of the information flow are shown in table 3.

**Table 3: Contents of DEFINE/DEFINE EXTERNAL USER information flow**

Element	Type
Restricted subscriber identity(ies)	M, note 1
Incoming services outside closed user groups restricted	C, note 2
Restricted incoming service types	C, notes 2 and 3
Restricted source address list	C, notes 2 and 3
Exceptions to restricted source address list	O, note 4
Acknowledgement from affected user	M, note 5
NOTE 1: At least one of the following elements shall be given in the definition indication: <ul style="list-style-type: none"> <li>- incoming services outside closed user group restricted;</li> <li>- restricted incoming service types;</li> <li>- restricted source address list.</li> </ul>	
NOTE 2: The element indicates the restricted service types.	
NOTE 3: The element is a list of restricted source addresses for incoming services. A restricted address comprises of a variable-length digit string. A service requested by subscriber, which address starts with the restricted digit string, shall be barred.	
NOTE 4: The element is a list of exceptions to the restricted source addresses for incoming services. A restricted address comprises of a variable-length digit string. If the digit string for exception source address is longer than the restricted source address, the exception source address overrides and the requested service is allowed.	
NOTE 5: The element indicates if the affected user(s) is requested to acknowledge the reception of the definition indication.	

### 5.2.1.4 DEFINE USER ACK

The optional DEFINE USER ACK information flow shall be applied for the relationship ra and shall be sent from FE1 to FE2. The flow shall also be applicable for the relationship re and rb and it shall be sent from FE1 to home SwMI FE2, if FE1 is in visited SwMI.

FE1 shall send the flow to acknowledge the reception of the SS-BIC definition indication conveyed in DEFINE USER or DEFINE EXTERNAL USER information flow, if the acknowledgement was requested, see table 3 Acknowledgement from affected user(s).

The contents of the information flow are shown in table 4.

**Table 4: Contents of DEFINE USER ACK information flow**

Element	Type
Distribution result	M, note
NOTE: This element indicates the definition indication result: <ul style="list-style-type: none"> <li>- Successfully received;</li> <li>- Unsuccessfully received and the applicable error code.</li> </ul>	

## 5.2.2 Interrogation

Authorized user may be able to interrogate the SS-BIC definitions saved in the SwMI. Affected user may be authorized to interrogate his own SS-BIC definitions and the SS-BIC definitions made for a group of which he is member.

If SS-BIC is interrogated in the home system of the restricted identity, the home system shall give the response to the interrogation request.

If SS-BIC is interrogated in a system that is a visited system in relation to the restricted identity, the visited system shall give the response to the interrogation request, if it has the SS-BIC definition. If a visited system does not have the SS-BIC definition or if it is otherwise not able to provide the response to the interrogation, the visited system shall send the interrogation request to the home system, which shall return the response to the visited system.

### 5.2.2.1 INTERROGATE

The optional INTERROGATE information flow shall be applied for:

- the relationship ra and shall be sent from FE1 to FE2;
- the relationship rc and sent from FE3 to FE2;
- the relationship re and rb and it may be sent from FE1 to home SwMI FE2, if FE1 is in visited SwMI;
- the relationship rf and rb and it may be sent from FE3 to home SwMI FE2, if FE3 is in visited SwMI.

FE1 or FE3 shall send the flow to interrogate the SS-BIC definition.

The contents of the information flow are shown in table 5.

**Table 5: Contents of INTERROGATE information flow**

Element	Type
Affected user identity(ies)	M, note
NOTE: The element specifies the TETRA subscriber identity(ies) against which SS-BIC have been interrogated.	

### 5.2.2.2 INTERROGATE ACK

The optional INTERROGATE ACK information flow shall be applied for:

- the relationship ra and shall be sent from FE2 to FE1;
- the relationship rc and sent from FE2 to FE3;
- the relationship rb and re and it may be sent from FE2 to FE1 via visited SwMI FE2;
- the relationship rb and rf and it may be sent from FE2 to FE3 via visited SwMI.

FE2 shall send the information flow as a response to the SS-BIC interrogation.

The contents of the information flow are shown in table 6.

**Table 6: Contents of INTERROGATE ACK information flow**

Element	Type
Affected user identity(ies)	M, note 1
Interrogation result	M, note 2
Incoming services outside closed user group restricted	O, note 6
Restricted incoming service types	O, note 3
Restricted source address list	O, note 4
Exceptions to restricted source address list	O, note 5
Delivery status to affected user(s)	O, note 7
NOTE 1: The element specifies the TETRA subscriber identity(ies) against which the SS-BIC interrogation is made. One subscriber identity, a range or set of subscriber identities are given.	
NOTE 2: This element indicates the interrogation result, for example: - SS-BIC defined for the given restricted subscriber identity(ies); - SS-BIC not defined for the given Restricted subscriber identity(ies); - interrogation rejected and the error code. The optional parameters in the INTERROGATE ACK are only used if the Interrogation result indicates that the definition has been made to the SwMI.	
NOTE 3: The element indicates the restricted basic and packet data service types.	
NOTE 4: The element is a list of restricted source addresses for incoming services. A restricted address comprises of a variable-length digit string. A service requested by subscriber, which address starts with the restricted digit string, shall be barred.	
NOTE 5: The element is a list of exceptions to the restricted source addresses for incoming services. A restricted address comprises of a variable-length digit string. If the digit string for exception source address is longer than the restricted source address, the exception source address overrides and the requested service is allowed.	
NOTE 6: If the element is present, it indicates that the SS-BIC definition has been sent to affected user(s) for information. If the restricted identity is a group, the affected users are the members of the group.	
NOTE 7: If the element is present, the element indicates if the affected user(s) has acknowledged the distribution of the definition indication.	

### 5.2.3 Operation

The SS-BIC operation occurs when FE2 bars an incoming service request on affected user's behalf. SS-BIC shall be operated due to the SS-BIC definitions made for an individual or group subscriber identity.

The SS-BIC operation shall bar services requested to an individual subscriber identity or group identity, if the requested service is in accordance with any of the restrictions in the SS-BIC definition of the identity:

- if calls requested from outside a closed user group are restricted and the calling party is outside the given user group;
- if the calling party address is restricted; or
- if the requested service type, e.g. circuit mode speech call, is restricted.

NOTE 1: 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 2: 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 3: 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.

If the SS-BIC definition is applicable to a service request, FE2 shall bar the request within the system:

- in the home system of the called subscriber identity, if FE5 is located in the system;
- locally in a visited system, if the SS-BIC definition is transported to the visited system.

NOTE 4: The visited system should have the SS-BIC definition for an individual subscriber, if the subscriber has migrated to that system.

NOTE 5: The visited system should have the SS-BIC definition for a group, if the system supports the group call.

FE2 in the home system of the restricted identity shall bar the request, if FE2 in visited system sends the service request to FE2 in the home system. FE2 in visited system cannot bar the call, if:

- FE5 is located in a system to which the SS-BIC definitions have not been transported; or
- the system where FE5 is located does not support SS-BIC.

### 5.2.3.1 CALL BARRED

The CALL BARRED information flow shall be applied for the relationship rg and shall be sent from FE2 to FE5. The flow may also be applied for the relationship rd and rg and it may be sent from FE2 to FE5 via another FE2.

FE2 shall send the information flow to FE5 to indicate that the service request has been rejected due to SS-BIC.

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

**Table 7: Contents of CALL BARRED information flow**

Element	Type
Called party	M
Rejection reason (SS-BIC invoked)	M

NOTE: Also NOTIFICATION information flow can be used, refer to EN 300 392-9 [5].

## 5.3 Service primitives

This clause lists SS-BIC service primitives used to invoke or being a result of information flow sequences. The SS-BIC service primitives are defined in EN 300 392-12-19 [2], clause 4.3 and the basic call service primitives are defined in EN 300 392-2 [1], clause 11.

The SS-BIC service primitives for the affected user (FE1) at the MS/LS TNSS-SAP may be:

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

The SS-BIC service primitives for the authorized user (FE3) at the MS/LS TNSS-SAP shall be:

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



The SS-BIC service primitives for the calling user (FE5) at the MS/LS TNSS-SAP may be:

- CALL BARRED indication; and
- NOTIFICATION indicator.

## 5.4 Information flow sequences

Signalling procedures shall be provided in support of the information flow sequences shown below. In addition, signalling procedures shall be provided to cover other sequences arising from error situations, interactions with basic call, interactions with other supplementary services, different topologies, etc.

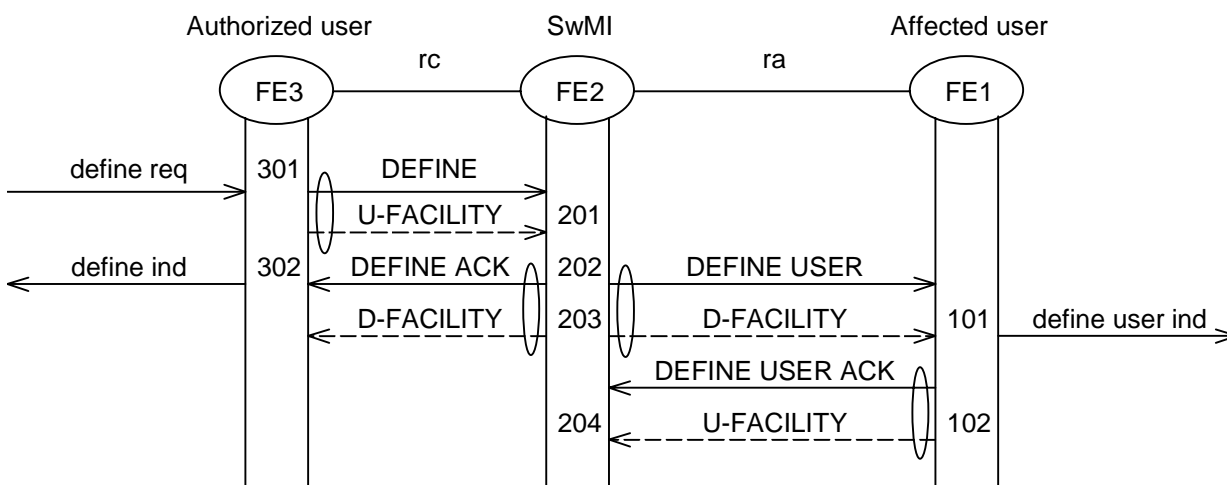
In the figures, the SS-BIC information flows are represented by solid arrows and basic call information flows are represented by broken arrows. An ellipse embracing two information flows indicates that the two information flows occur together. Within a column representing the SS-BIC functional entity, the numbers refer to functional entity actions listed in clause 4.5.

No timers are used in the figures.

NOTE: The information flow sequences are examples and they may not cover all possible variations of the service.

### 5.4.1 Definition

Figure 4 shows the information flow sequence for the SS-BIC definition within the home system.



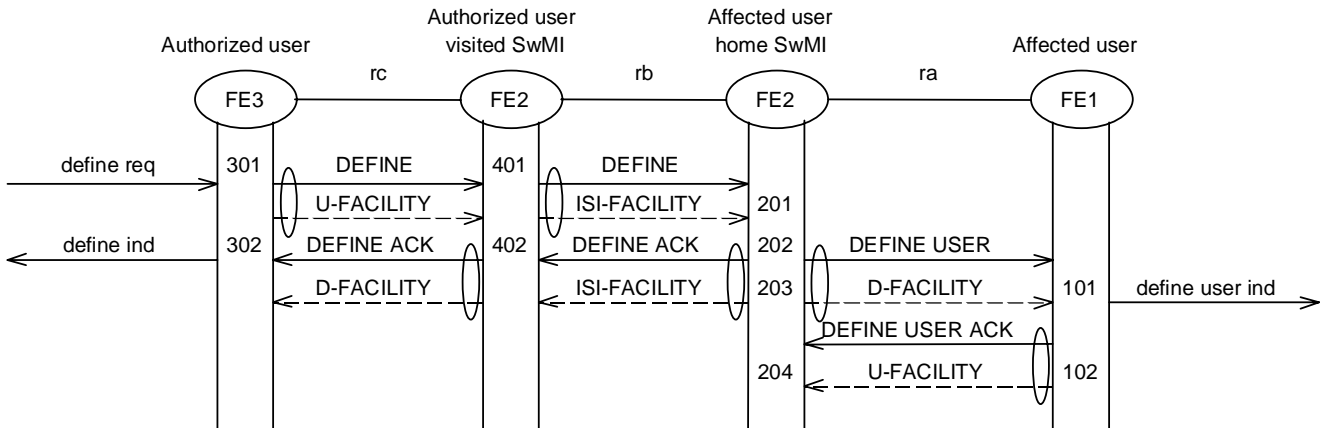
NOTE 1: The sending of DEFINE USER and DEFINE USER ACK is optional.

NOTE 2: The same information flow figure applies to the DEFINE EXTERNAL, DEFINE EXTERNAL USER, DEFINE ACK and DEFINE USER ACK flows.

**Figure 4: Definition of SS-BIC**

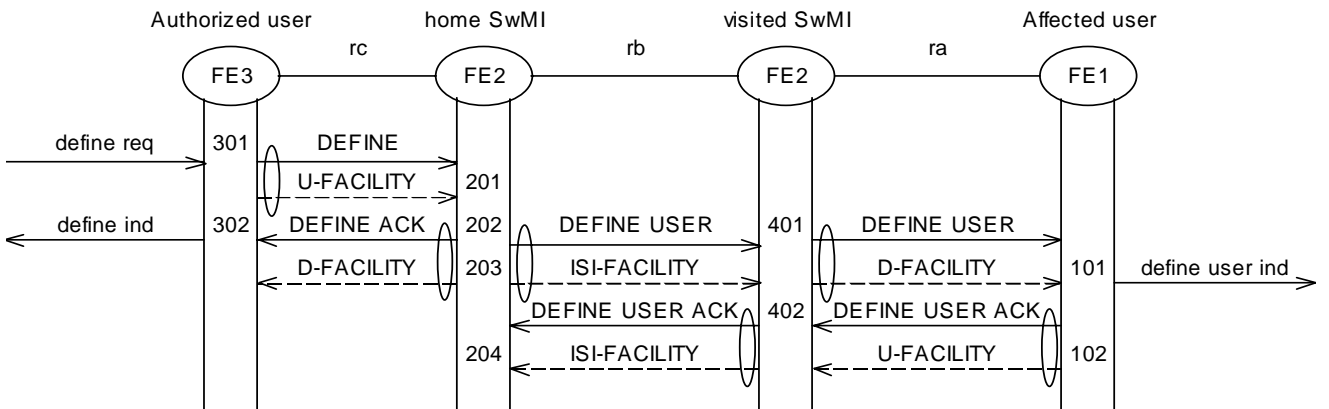
### 5.4.2 Definition over ISI

Figures 5 and 6 show the information flow sequence for the SS-BIC definition requested over the ISI.



NOTE 1: The sending of DEFINE USER and DEFINE USER ACK is optional.  
 NOTE 2: The same information flow figure applies to the DEFINE EXTERNAL, DEFINE EXTERNAL USER, DEFINE ACK and DEFINE USER ACK flows.

**Figure 5: Definition of SS-BIC over the ISI**

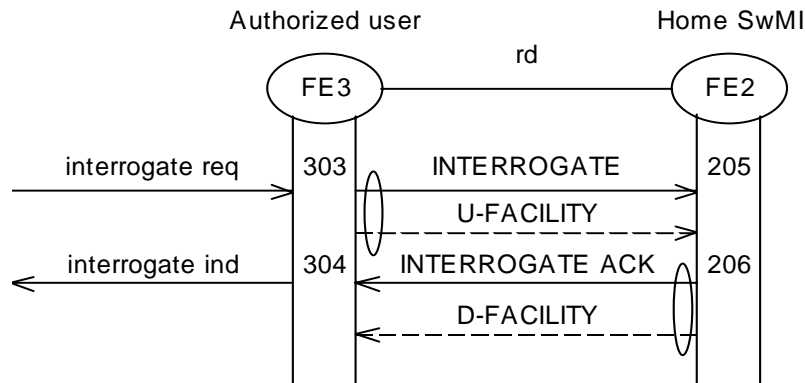


NOTE 1: The sending of DEFINE USER and DEFINE USER ACK is optional.  
 NOTE 2: The same information flow figure applies to the DEFINE EXTERNAL and DEFINE EXTERNAL ACK flows.

**Figure 6: Definition of SS-BIC over the ISI**

### 5.4.3 Interrogation

Figure 6 shows the information flow sequence for the SS-BIC interrogation within the home system. Figure 7 should also be applicable for visited system to which the SS-BIC definition has been transported.

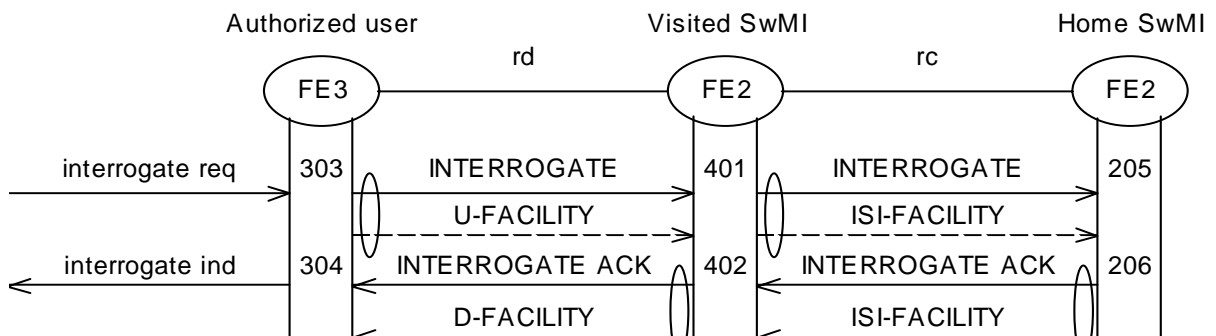


NOTE: Affected user may also interrogate SS-BIC.

**Figure 7: Interrogation of SS-BIC**

### 5.4.4 Interrogation over ISI

Figure 8 shows the information flow sequence for the SS-BIC interrogation over the ISI.



NOTE: Affected user may also interrogate SS-BIC over the ISI.

**Figure 8: Interrogation of SS-BIC over the ISI**

## 5.4.5 Operation

Figure 9 shows the information flow sequence for the SS-BIC operation within one system. The system shall be the home system or a visited system to which the SS-BIC definition has been transported.

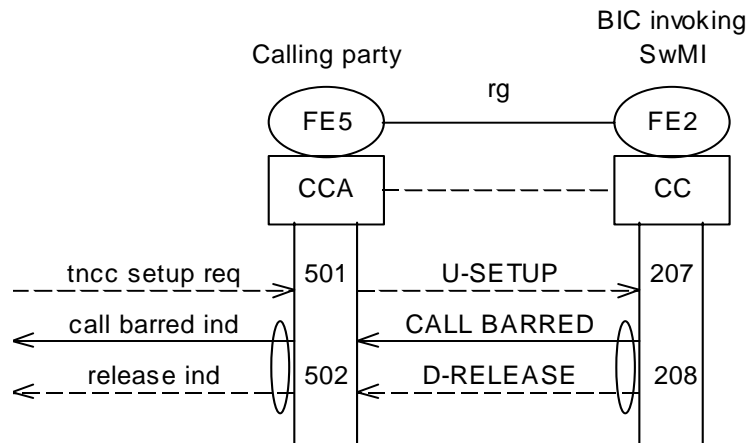


Figure 9: Operation of SS-BIC

## 5.4.6 Operation of SS-BIC when the service is barred through ISI

Figure 10 shows the information flow sequence for the SS-BIC operation when the service is barred through the ISI. The scenario in figure 10 applies for the visited system that sends the service request to the home system of the restricted identity.

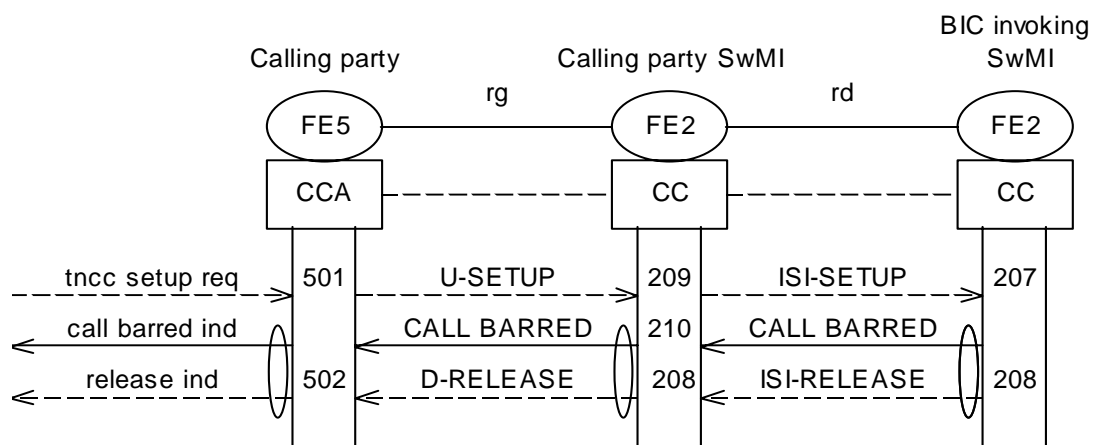


Figure 10: Operation of SS-BIC when the service is barred through the ISI

## 5.5 FE actions

### 5.5.1 FE actions of FE1

- 101 Upon reception of the SS-BIC definition indication, FE1 shall inform the user of the indication.
- 102 FE1 shall acknowledge the SS-BIC definition indication to FE2, if the acknowledgement was requested in the indication.

## 5.5.2 FE actions of FE2

- 201 Upon reception of the SS-BIC definition request, FE2 shall verify that the request is authorized and parameters valid. If FE2 accepts the definition, FE2 shall save the definition into the SwMI.
- 202 FE2 shall acknowledge the definition request to FE3.
- 203 FE2 shall send the SS-BIC definition indication to FE1, if FE2 accepted the SS-BIC definition request and if FE3 requested the sending in the definition request.
- 204 Upon reception of the SS-BIC definition indication acknowledgement from FE1, FE2 shall record the acknowledgement.
- 205 Upon reception of the SS-BIC interrogation request, FE2 shall verify that the request is authorized and parameters valid.
- 206 FE2 shall send the interrogation response to FE3.
- 207 Upon reception of a service request, FE2 shall bar the request if in accordance with the SS-BIC restriction.
- 208 FE2 shall indicate the barring to FE5.
- 209 If the service request is not barred in the visited system, the request may be sent to the home system.
- 210 Upon reception of the barring indication from home system, FE2 shall bar the call.

## 5.5.3 FE actions of FE3

- 301 Upon reception of the SS-BIC definition request from the user, FE3 shall send the request to FE2.
- 302 Upon reception of an acknowledgement to the SS-BIC definition request from FE2, FE3 shall indicate the acknowledgement to the user.
- 303 Upon reception of the SS-BIC interrogation request from the user, FE3 shall send the request to FE2.
- 304 Upon reception of a response to the SS-BIC interrogation request from FE2, FE3 shall indicate the response to the user.

## 5.5.4 FE actions of visited SwMI FE2

- 401 When the visited SwMI FE2 receives an SS-BIC information flow from FE3, the visited SwMI FE2 shall send the flow to FE2 in FE3's home SwMI.
- 402 When the visited SwMI FE2 receives an SS-BIC information flow from FE2 in FE3's home SwMI, the visited SwMI FE2 shall send the flow to FE3.

Refer EN 300 392-9 [5] for further details.

## 5.5.5 FE actions of FE5

- 501 When FE5 receives a call invocation request from the user, FE5 shall send it to FE2.
- 502 Upon reception of a call invocation rejection due to SS-BIC, FE5 shall indicate the rejection reason to the user.

## 6 Allocation of FEs to physical equipment

The allocation of FEs to physical equipment is described in table 8. Other means of SS-BIC management are optional and outside the scope of the present document.

**Table 8: Allocation of FEs to physical equipment**

Equipment/Function	SS-BIC Management	SS-BIC Operation
SwMI	FE2 (Optional, note 1)	FE2 (Mandatory)
MS	FE1 (Optional), FE3 (Optional, note 1)	FE5 (Optional, note 2)
LS	FE1 (Optional), FE3 (Optional, note 1)	FE5 (Optional, note 2)
NOTE 1: Support of the SS-BIC management is optional. If supported the FE is mandatory.		
NOTE 2: The SS-BIC shall operate even is the calling entity does not support FE5 functional entity.		

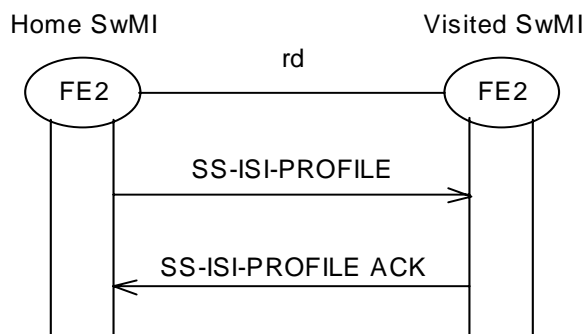
## 7 Inter-working considerations

The SS-BIC may extend to several TETRA networks. The requirements for the inter-working over the ISI are:

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

Figure 11 shows SS-BIC information exchange during migration.

Profile contains the same information as the DEFINE/DEFINE EXTERNAL information flow.



**Figure 11: SS-BIC profile exchange between SwMIs**

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## History

<b>Document history</b>		
Edition 1	October 1996	Public Enquiry PE 116: 1996-10-21 to 1997-02-14
	June 2001	Converted into an EN between Public Enquiry and Vote
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