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TECHNICAL **C**OMMITTEE
REFERENCE **T**ECHNICAL **R**EPORT

TCR-TR 040

September 1995

Universal Personal Telecommunication (UPT);
Phase 1;
Requirements on Information Flows (IFs) and protocols

ETSI

Contents

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Foreword

This Technical Committee Reference Technical Report (TCR-TR) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI). It was given the classification of TCR-TR by the 20th TC Chairmens' Co-ordination (TCC) meeting and approval by the 22nd Technical Assembly (TA).

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1   Scope

This Technical Committee Reference Technical Report (TCR-TR) gives a description of the Information Flows (IFs) and the procedures associated with the Universal Personal Telecommunication (UPT) user procedures for phase 1 defined in: NA-TR 007 [2].

2   References

This TCR-TR incorporates by dated and undated reference, provisions from other publications. These 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 TCR-TR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1]   NA-TR 004: "Universal Personal Telecommunication (UPT); Phase 1 (restricted UPT service scenario); Service aspects: Guidelines".

[2]   NA-TR 007: "Universal Personal Telecommunication (UPT); Phase 1 (restricted UPT service scenario) User procedures and user states".

[3]   NA-TR 013: "Universal Personal Telecommunication (UPT); Phase 1: Architecture and functionalities for interworking".

[4]   ETS 300 391-1: "Universal Personal Telecommunication (UPT); Specification of the security architecture for UPT phase 1; Part 1: Specification".

[5]   ETS 300 374-1: "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 1: Protocol specification".

[6]   ITU-T Recommendation Q.1214: "Distributed functional plane for intelligent network CS-1".

[7]   ITU-T Recommendation Q.1218: "Interface Recommendation for intelligent network CS-1".

3   Symbols and abbreviations

3.1   Symbols

For the purposes of this TCR-TR, the following symbols apply:

————————————   IN Information Flows

— — — — — —   Network signalling

- - — - - — - -   Inband user signalling and interactions

*   header or separator

\#   trailer or end of sequence

( )   character not mandatory

3.2 Abbreviations

For the purposes of this TCR-TR, the following abbreviations apply:

IFs:

APPLYCHG	Apply Charging
APPLYCHGRPT	Apply Charging Report
ARI	Assist Request Instruction
COLL-UI	Collected User Information
CONNTORES	Connect to Resource
DISCFWDCONN	Disconnect Forward Connection
ETC	Establish Temporary Connection
EVREPBCSM	Event Report Basic Call State Machine
FURNCHGINFO	Furnish Charging Information
INITIALDP	Initial Detection Point
P&C	Prompt and Collect User Information
PLAYANN	Play Announcement
REQREPBCSM	Request Report Basic Call State Machine Event
SRFRPT	Specialized Resource Function Report

Functional Entities:

CCF	Call Control Function
SCF	Service Control Function
SDFh	Service Data Function in the user's home network
SDFo	Service Data Function in the originating network
SMF	Service Management Function
SRF	Specialized Resource Function
SSF	Service Switching Function

Other abbreviations:

BCSM	Basic Call State Model
CLI	Calling Line Identification
DTMF	Dual Tone Multi-Frequency
ESC	Escape Code
FC	Feature Code
IF	Information Flow
IP	Intelligent Peripheral
PIN	Personal Identification Number
PUI	Portable User Identity
SPIN	Special Personal Identification Number
UPT	Universal Personal Telecommunication
User A	Calling User
User B	Called User

4 General

4.1 Assumptions

The following assumptions have been made:

a)   inband Dual Tone Multi-Frequency (DTMF) interaction with analogue users;

b)   automatic calling line identification may exist as an option;

c)   authentication of the calling user is entirely controlled from the home network. This includes manual/weak and automatic/strong authentication. In particular, in manual authentication the counting of the number of attempts is done by a counter in the home network;

d)   automatic calling line identification may exist as an option;

e)   unsuccessful call attempts such as premature release, release by the IN-network, wrong numbering or the use by the user of an Escape Code (ESC) are not exhaustively investigated;

f)   operations are used to require the Service Switching Function (SSF) to prepare call or request records:

-       records sent from SSF for off-line processing;
-       records returned to Service Control Function (SCF) and sent to Service Management Function (SMF) for off-line processing;
-       records returned to SCF and sent to Service Data Function (SDF) for on-line processing.

g)   the follow-on procedure can only be offered if the SSF receives an explicit Clear Back signal from the outgoing circuit when the called user hangs up;

-       the B-connection is released immediately (B-party re-answer is not offered);

h)   furthermore, in phase 1, all user related data is located in one single data base in the home network: SDFh. (No transfer of data between networks):

-       registration data (in SDFh) is thus updated either locally in the home network or from the originating/visited network;
-       remote registration to a third network is not allowed;

i)   IN-network interworking capabilities are restricted to the access of the SDF of the home network of User A or User B (SDFhA, SDFhB) from the SCF of the originating/visited network SCFo.

4.2   General comments

1)   The IFs between SCF and SDF are used in conformance with the CS-1 enhancements specified in the "frozen" version of the ITU-T Recommendations Q.1214 [6] and Q.1218 [7].

2)   In many procedures, the user is guided by prompts. It is assumed that if the user does not react within a given time or after a certain number of prompt repetitions a forced network release will take place.

3)   At the end of entries with non-fixed length (numbers, identities, Personal Identification Number (PIN), etc.) the user may dial a flag: (#). If the user doesn't enter a #, end of entry will be determined by a time-out followed in relevant cases by a prompt.
A separator: (*) may also be used between entries to enable combination of entries in one sequence. Some examples are given in annex A.
In this way, some intermediate prompts could be overridden and it would result in quicker and more user-friendly service provision.
However, certain prompts cannot be overridden and will not be interrupted e.g. denied authentication.
In certain procedures, e.g. registration and service profile modification, the user may enter an ESC to return to the choice of feature. The use of ESC could be extended to other procedures. However this needs further study.
The content of the announcements given to the user, as shown in the diagrams, should only be regarded as examples.
Whenever possible a format check is applied to user entries.

4)   To prevent the service/network from being misused, e.g. abnormal number of retries after a request rejection, the network may release the user.
This function is carried out through a transaction based counter in the SCF.
The counter is incremented for every unsuccessful attempt (authentication, user requests, call attempts etc.). This includes also entries with a wrong format.
The counter is reset at the end of each transaction.

5)   Whether successful or not a trace of all user requests and call attempts should be kept on records at the request of the SCF.
Primarily the records will be used for charging but could also be used for other purposes like observation, fraud tracking and statistics.
Parts of the records may be operator specific.
To control record generation, two operations can be used depending on where the charging point resides in the network:

-        "FurnishChargingInformation" is used if call record is generated at SSF;
-        "ApplyCharging" is used if the call record is generated at SSF and collected by the SCF;
-        "ApplyCharging" is used when real-time transfer of charging information is necessary.

To provide for the most accurate and complete content of these records as the request progresses and to record different legs of service logic in a call session, both operations may be issued several times.
However, when an "ApplyChargingReport" is pending, no further "ApplyCharging" operation can be sent until "ApplyChargingReport" is received in the SCF.
Records collected by the SCF may be used for real-time charging.

4.3 Organization of UPT sequences

Figure 1 gives an example of how some sequences and procedures may be organized to form a complete service.

The detailed content of the procedures is given in the following subclauses.
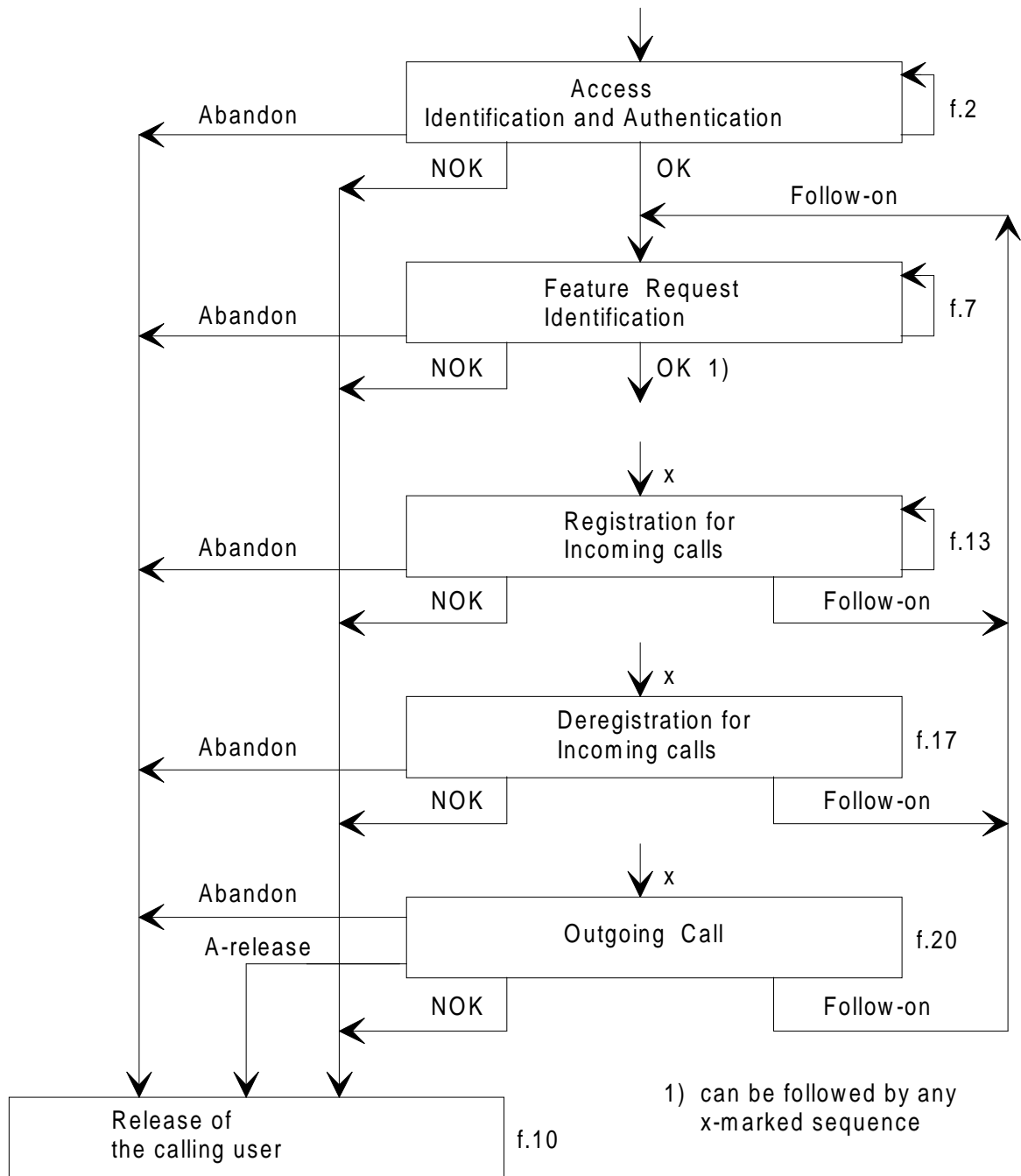
NOTE: Other x-marked sequences, like service profile modification, PIN change procedure can be included and processed in the same way as any x-marked sequence.

Figure 1: Organization of UPT sequences

5 Common sequences

This clause regroups sequences of IFs used in conjunction with several procedures.

Only the value of the Information Elements contained in the IFs may vary.

5.1 Access, identification and authentication

Most UPT procedures starts with a user request followed by an identification and an authentication. The organization of these sequences is given in the block diagram of figure 2.
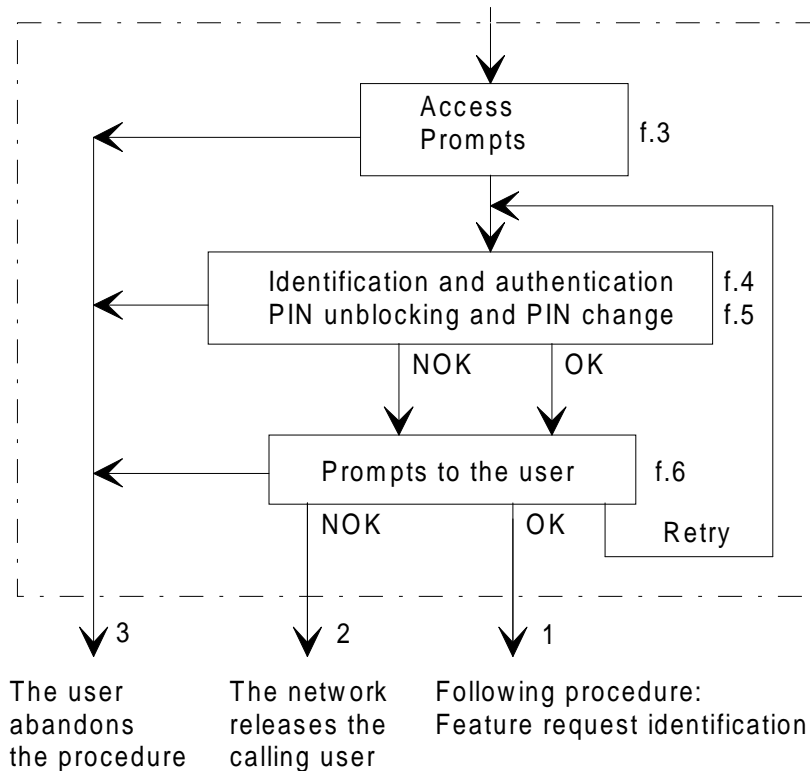
Figure 2: Access, identification and authentication

The procedure includes the possibility for the user to make several attempts (retries).

PIN unblocking and PIN change can be associated with the Manual Authentication procedure only.

Prompts are given to the user after each attempt according to the result of the procedure and allowed service options.

The logical outputs of the procedure are:

1) OK: proceed to next procedure;

2) NOK: the user is released by the network after a prompt:

- when the last permitted attempt has failed;
- when a given number of rejected requests is reached;
- (protection against misuse through a transaction based counter in SCF).

3) the user abandons the request (in any state).

Access and prompts

```
- - - - - - - - - - - - - - - - originating network  - - - - - - - - -> <- home network
  ref.    USER         CCF/SSF        SCF          SRF         SDFo         SDFhA
1         UPT Request
                                  INITIALDP
2
                                  REQREPBCSM
3
                                  FURNCHGINFO
4
```

case i: IP directly connected to the SSP, operations not relayed by SSP

```
5                                    ETC

6                        setup r.i.

7                                  setup r.c.

8                                    ARI
```

==> go to 9

case ii: IP integrated or directly attached to the SSP. The SSP relays the operations.

```
5a                       CONNTORES

6a                       setup r.i.

7a                                 setup r.c.
```

==> go to 9

```
9                                              P&C

10                     "provide your identity"
```

==> go to 11 or 11a

NOTE: For simplicity, the two Specialized Resource Function (SRF) connection scenarios - case i and
           ii - will not be reproduced further in this TCR-TR.

Figure 3: Access and prompts

> *Identification and Authentication*

- - - - - - - - - - - - - - - originating network - - - - - - - - -> <- home network
ref.   USER   CCF/SSF   SCF   SRF   SDFo   SDFhA

Manual procedure (simple PIN):

11   PUI (#)

12   COLL-UI

13   P&C

14   " please enter your PIN "

15   PIN (#) or * SPIN (#)
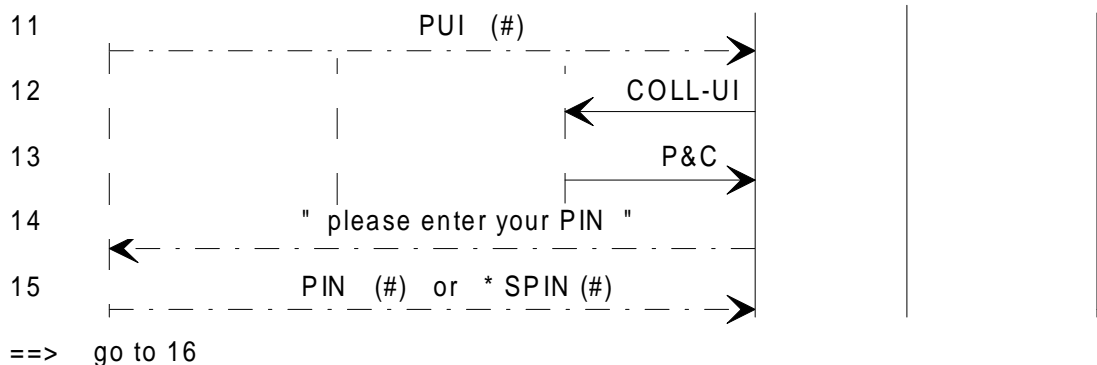
==>   go to 16

Automatic procedure (strong one-way):

11a   * PUI * CT * Ns * AC #

==>   go to 16

16   COLL-UI

17   Search

18   Search Result
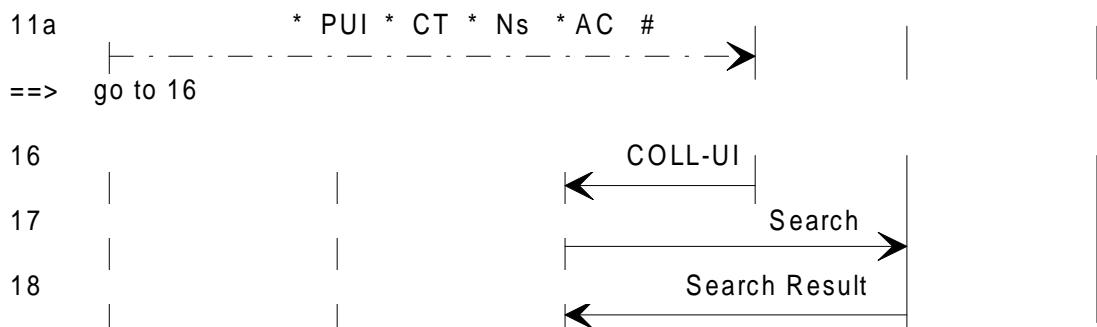
==>   If the local check fails go to 21, else:
==>   If the user enters * SPIN in place of PIN (manual authentication) go to 35, else go to 19:

19   Authenticate

20   Authenticate Result

21   FURNCHGINFO
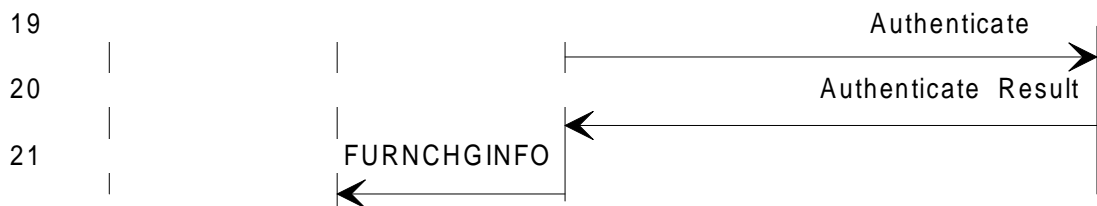
==>   If authentication is successful, go to 51, else:

==>   Authentication has failed. If another attempt may take place go to 61
==>   If last permitted attempt fails go to 31
==>   If the local maximum number of rejected requests is reached go to 71
==>   If authentication is not possible (failed local check) go to 91

NOTE: The Special Personal Identification Number (*SPIN) sequence is accepted by the SDFhA only
            when the Portable User Identity (PUI) is blocked.

            Entering the *SPIN in place of a valid PIN in other situations will result in a failed authentication
            attempt, counted by the authentication counter as any other failed attempt.

Figure 4: Identification and authentication

PIN unblocking and PIN change

- - - - - - - - - - - - - - - - originating network - - - - - - - - - -> <- home network
ref.   USER   CCF/SSF   SCF   SRF   SDFo   SDFhA

PIN unblocking:

31   P&C

32   "You may enter special code (SPIN), or hang up"

33   * SPIN #

34   COLL-UI

35   Search

36   Search Result

37   FURNCHGINFO

==>   If PIN unblocking is sucessful go to 81, else go to 91
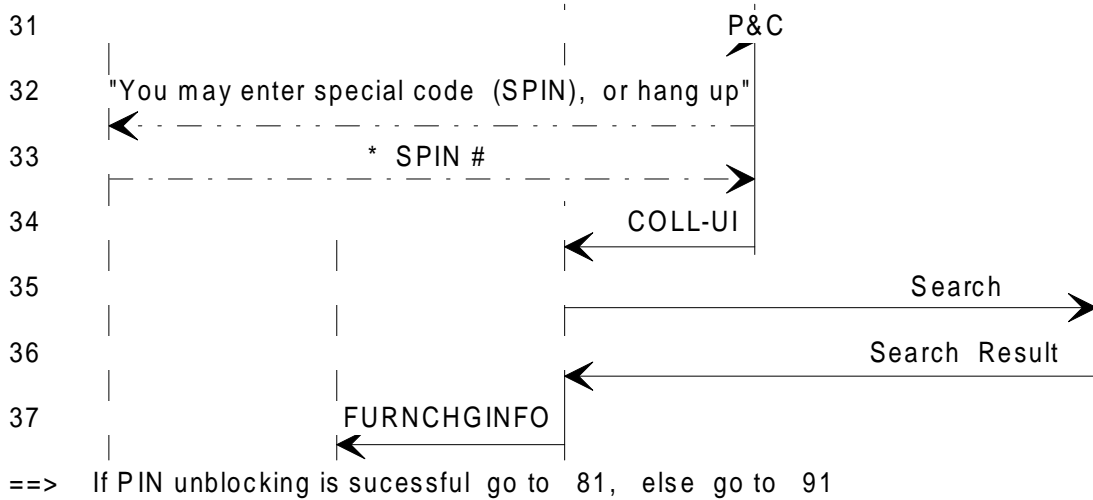
PIN change (only for manual authentication):

41   P&C

42   " Enter the new PIN sequence "

43   NPIN * NPIN (#)

44   COLL-UI

==>   If NPIN = NPIN go to 45,
==>   else: if a retry is allowed go to 61
==>   if no retry is allowed go to 91

45   Update

46   Update Result

47   FURNCHGINFO

==>   If PIN change is successful go to 48
==>   else: if a retry is allowed go to 61
==>   if no retry is allowed go to 91

48   PLAYANN

49   " Your input is registered "

==> go to 51
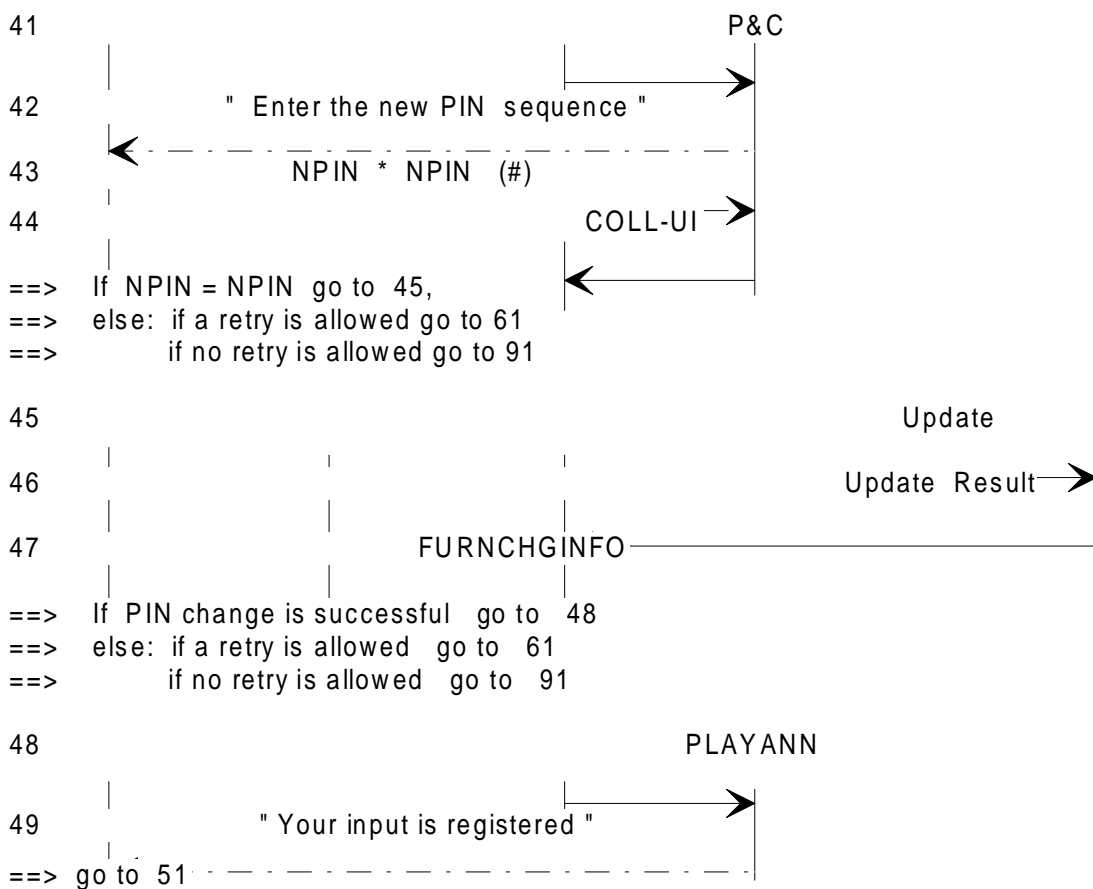
NOTE: PIN unblocking and PIN change procedures can only be associated with the manual
          authentication. The PIN change procedure may be offered as an independent procedure with a
          specific Feature Code (FC). See annex A, figure A.1.

Figure 5: PIN unblocking and PIN change

Prompts to the user

```
ref.     USER          CCF/SSF           SCF              SRF

51        |              |                |        P&C
          |              |                |------------------>

52        |<-------------"Please enter feature code"----------
```
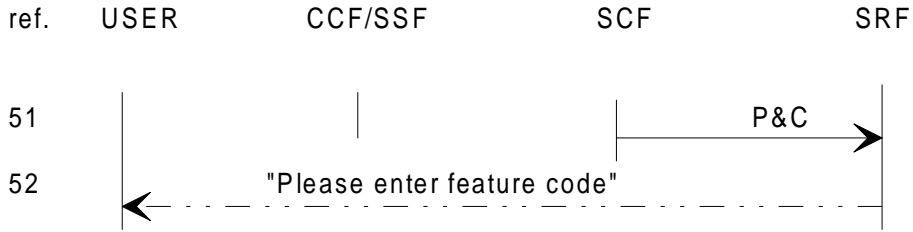
Logical output 1: ==> next procedure: *Feature Request Identification*

```
61        |              |                |        P&C
          |              |                |------------------>

62        |<----"Invalid input, you may retry with valid information"----
```
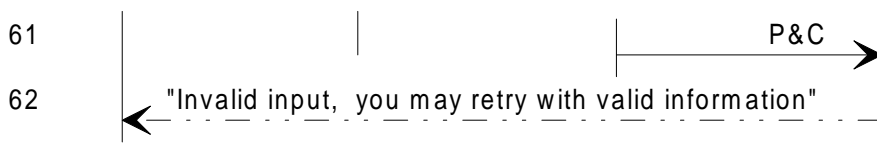
Retry: ==> go to 11, 11a, 31 or, after a PIN change only, 43
Logical output 2/3: ==> go to *Release of the calling user*

```
71        |              |                |      PLAYANN
          |              |                |------------------>

72        |<--"Maximum number of retries exceeded, please hang up"
```

Logical output 2/3: ==> go to *Release of the calling user*

```
81        |              |                |        P&C
          |              |                |------------------>
          "Do you want to change your PIN code ? Enter YYY
82        to confirm, NNN to cancel or ESC to make another request"
          |<----------------------------------------------

83        |--------------" User acknowledgement "-------------->

84        |              |                |<-------COLL-UI
```
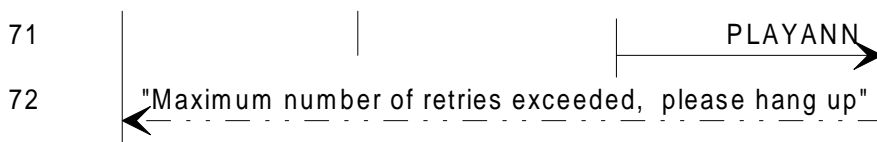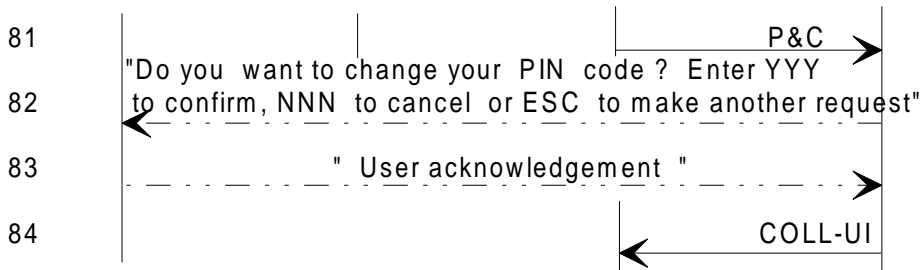
If ESC or NNN : go to 51, else go to 41
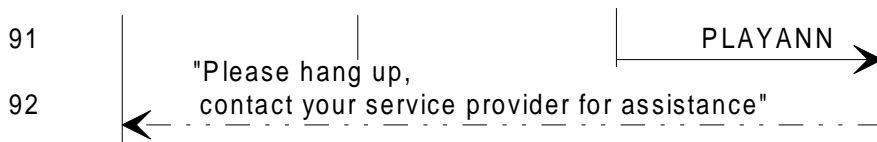
```
91        |              |                |      PLAYANN
          |              |                |------------------>
          "Please hang up,
92        |<----contact your service provider for assistance"
```

Logical output 2/3: ==> go to *Release of the calling user*

NOTE: After any prompt the user may abandon: logical output 3, or not react within a given time:
             logical output 2.

Figure 6: Prompts to the user

Notes on access, identification and authentication.

IF ref.:

1, 2:	The UPT request contains information that enables Call Control Function/Service Switching Function (CCF/SSF) to trigger "Initial Detection Point".
3:	"Request Report BCSM Event" contains the list of events and their monitoring mode (may be useless if the DPs are statically armed).
4:	The "FurnishChargingInformation" operation is sent to instruct SSF to create a call record for the following user request.
5-8:	The SSF is ordered to connect an SRF using the ETC operation. The ARI operation is used (SCF-SRF operations not relayed by SSF).
5a-7a:	The SSF is ordered to connect an SRF using "Connection to Resource". In this case the SCF-SRF operations are relayed by the SSF.
9, 10:	"Prompt and Collect User Info" enables the SRF to prompt the user.
11:	In manual procedure the user sends the PUI number.

- To avoid to wait for end of dialling recognition by a time-out, the user may use a star: (*) to speed up the procedure and then dial the PIN in the same sequence.
- After the PIN, a square: (#) may be dialled to terminate the sequence.

12:	"Collected Info" to SCF contains information received from the user.
13-15:	If the user does not dial the (#) and waits, he/she is prompted to send the PIN. The PIN request is systematic.
11a:	In automatic procedure the subscription device sends all authentication information in one string.

> The star (*) is used as a separator.
> At the head of the sequence, the (*) enables the SCF and the SDFhA to recognize an automatic authentication sequence.

16:	The complete string of information is received in the SCF, a format check is applied.

NOTE 1: A local black-listing of users misusing the service may exist. However, this has no impact on the IFs and is not reflected in the diagrams.

NOTE 2: When the PUI is blocked, the user enters *SPIN in place of the PIN. The sequence is sent to the home network for PIN unblocking. See 35-36.

17, 18:	The SDFo query provides a local check e.g. to check if there exists particular agreements between the local service provider and the user's home provider (Agreement check).

- SDFh address and service specific data e.g. maximum global counter value may also be retrieved with this local check.

19, 20:	The received information is sent to SDFh in one string for authentication.

- SDFh monitors and keeps a count of the number of attempts.
- SDFh sends the result of authentication back to SCF.

21: The "FurnishChargingInformation" operation is sent to instruct SSF to update the record.

NOTE 3: According to the phase of authentication: 1st, 2nd, etc., last attempt exchanges 11 or 11a to 21 can be repeated.

31, 32: The user is informed that special unblocking code (*SPIN) may be entered.

33-36: When the user enters the *SPIN a check is made in the home network. If successful the user is unblocked and may proceed to other sequences.

The * dialled before the SPIN is necessary to identify the unblocking sequence.

NOTE 4: How a successful PIN unblocking sequence resets the PIN counter in the SDFhA is for further study.

37: The "FurnishChargingInformation" operation is sent to instruct SSF to update the record.

41-46: The user is prompted to enter the special PIN change sequence.

- The PIN change sequence is sent to the home network. If the procedure is successful the user may proceed to feature identification. If not, another attempt may be allowed.

47: The "FurnishChargingInformation" operation is sent to instruct SSF to update the record.

NOTE 5: The PIN change procedure may be offered as an independent procedure with a specific FC.

48, 49: The SRF prompts the user that the PIN change is registered.

51, 52: The SRF is ordered to inform the user that authentication is successful and that feature identification may now take place.

61, 62: The SRF is ordered to inform the user that another attempt is allowed. (No reason is given).

71, 72: The SRF prompts the user that the maximum number of rejected requests is reached. (The count of the number of attempts is done in the SCF). The user is asked to hang up.

81, 84: The user is offered to change the PIN by entering a special PIN change sequence.

- According to user acknowledgement the PIN change procedure takes place or the user proceeds to feature identification.

91, 92: The user is asked to hang up. No further attempt is allowed, but the line is not blocked. The user may contact the local/home provider for assistance.

5.2 Feature request identification

This sequence takes place:

- after a successful authentication;
- as a follow-on after any other procedure.

The organization of this sequence is given in the block diagram of figure 7.
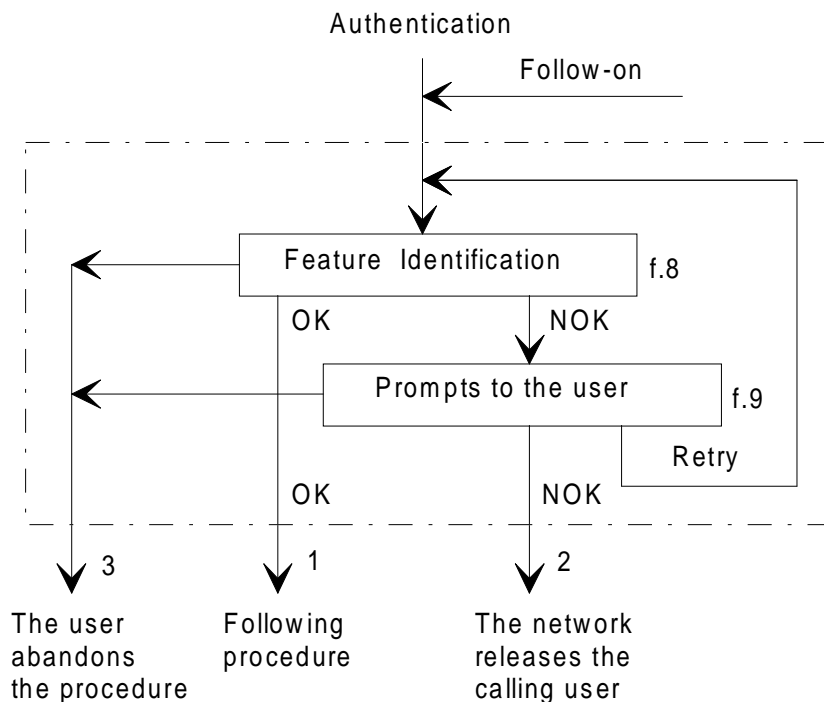
Figure 7: Feature request identification

When the request is denied, the user could be allowed to request another feature (retry = follow-on).

The logical outputs of the procedure are:

1) OK: proceed to next procedure;
2) NOK: the user is released by the network, after a prompt (see note);
3) the user abandons the request (in any state).

   NOTE: To prevent the service/network from being misused e.g. abnormal number of retries after a request rejection, the network may release the user. This function is carried out in the SCF.

```
                        ┌─────────────────────────────────────┐
                        │         Feature identification        │
                        └─────────────────────────────────────┘

- - - - - - - - - - - - - - originating network  - - - - - - - - - - -> <- home network
ref.  USER         CCF/SSF         SCF          SRF        SDFo      SDFhA

1      │─────── feature code e.g. registration, (#) ───────►│         │         │
       │- - - - - - - - - - - - - - - - - - - - - - - - - -►│         │         │
2      │           │              │◄──── COLL-UI ──────────│         │         │
       │           │              │                         │         │         │
3      │           │              │─────── Search ──────────────────►│         │
       │           │              │                         │         │         │
4      │           │              │◄──── Search Result ──────────────│         │

==>  If check is successful go to 5, else go to 7


5      │           │              │─────────── Search ─────────────────────────►│
       │           │              │                         │         │         │
6      │           │              │◄────────── Search Result ────────────────────│
       │           │              │                         │         │         │
7      │           │◄─ FURNCHGINFO │                         │         │         │
       │           │              │                         │         │         │
```

==> If check is successful go to the required procedure.
==> If the maximum number of rejected requests is reached go to 21
==> Else go to 11
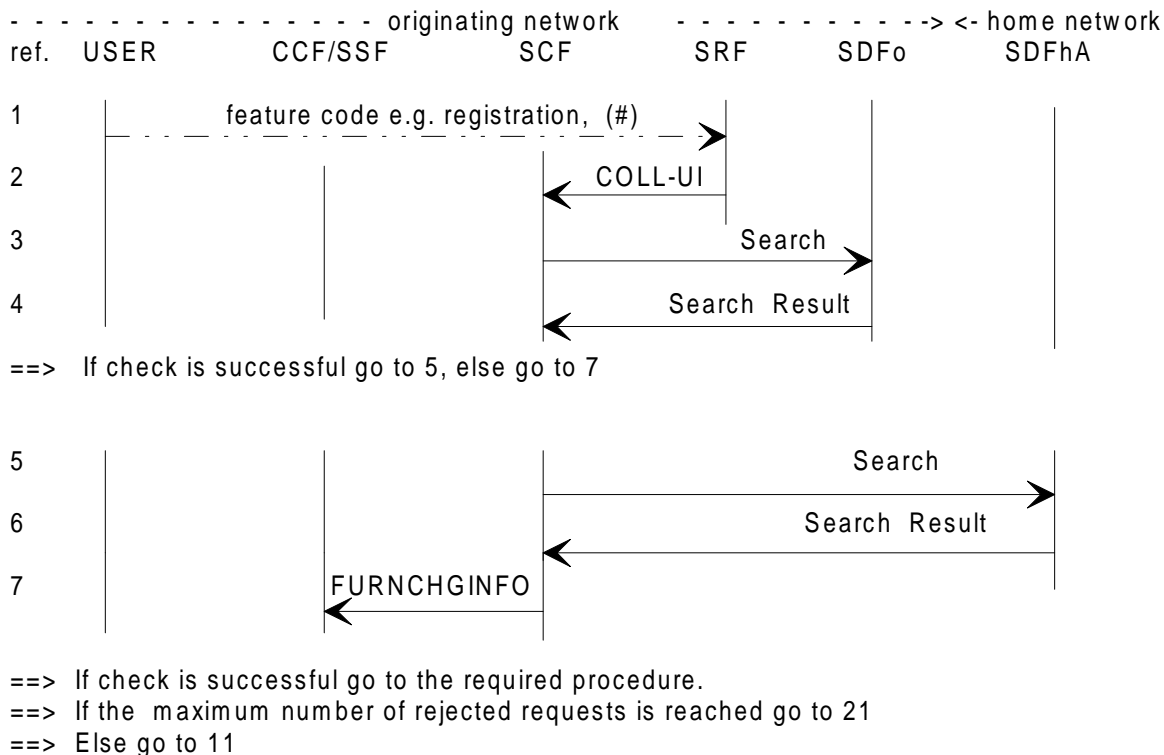
Figure 8: Feature identification

```
                        ┌─────────────────────────────────────┐
                        │          Prompts to the user          │
                        └─────────────────────────────────────┘

        ref.  USER            CCF/SSF            SCF              SRF

11        │               │                  │─────── P&C ──────►│
          │   "unauthorised procedure, your request cannot be     │
12        │◄── handled identify another request or terminate"      │
```

NOTE 1:   The prompt given to the user may vary depending on the requested feature and/or nature of
           the rejection.

```
        ref.  USER            CCF/SSF            SCF              SRF

21        │               │                  │────── PLAYANN ────►│
          │                                                        │
22        │◄── "Maximum number of retries exceeded, please hang up"│
```
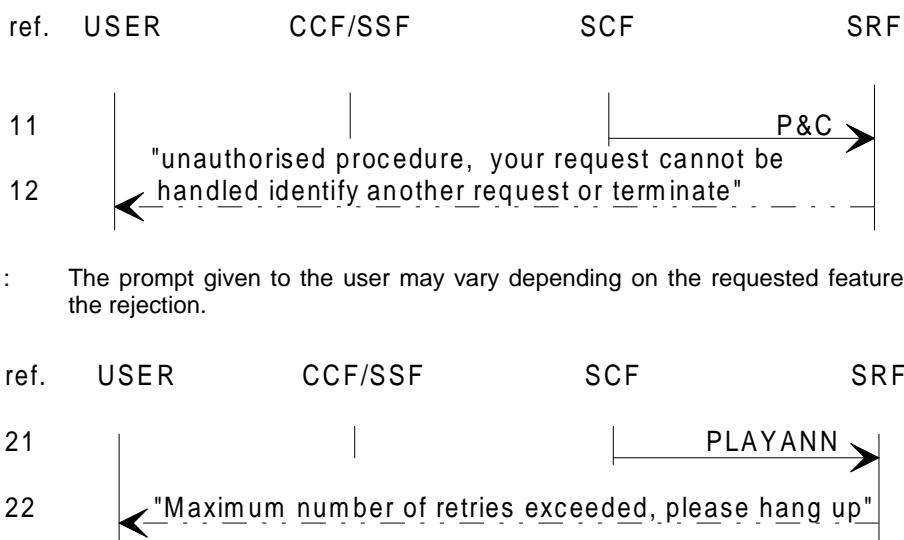
Logical output 2/3: ==> go to *Release of the calling user*

NOTE 2:   After any prompt the user may abandon: logical output 3, or not react within a given time:
           logical output 2.

Figure 9: Prompts to the user

Notes on feature request identification.

IF ref.:

1, 2:   The user indicates the requested FC.

-       The SRF sends the received code to the SCF. The feature request may be made in several steps.
-       A flag may be input at the end of the request. This would allow immediate input of the following information.

3, 4:   The SDFo query is intended to locally check e.g. if there exists particular agreements between the local service provider and the user's home provider for that feature request. (Agreement check; may include follow-on allowance).

5, 6:   The SDFh query is intended to check e.g. if the user has subscribed to the requested feature, if the request is consistent with user state. (profile check which may also contain a credit indicator).

-       In the follow-on this check could be used between two sub-calls to verify if the user is allowed to continue e.g. credit check (for further study).
-       According to feature request and to inter-operator agreements, some of these checks might be superfluous.
-       When the request is not accepted another attempt could be allowed: exchanges 1-6 could be repeated after a prompt (see 11,12).

7:                    The "FurnishChargingInformation" operation is sent to instruct SSF to update the record or to create a new record after a follow-on.

11, 12:   The SRF prompts the user that the request cannot be handled. The user is asked to terminate or to request another procedure.

    NOTE: The prompt given to the user may vary depending on the requested feature and/or nature of the rejection.

21, 22:   The SRF prompts the user that the maximum number of rejected requests is reached. (The count of the number of attempts is done in the SCF). The user is asked to hang up.

5.3   Release of the calling user

This sequence takes place at the end of every UPT user request.

The following situations may be encountered:

-     release initiated by the user hanging up spontaneously in any state, or during/consequent to the reception of an announcement. The release may also be initiated by the originating network;

-     forced release initiated by the IN-node, immediately or after a prompt (possibly associated with a time out), e.g. when, following to an invitation to terminate, the user does not hang up.

Thus the release procedure has the following inputs:

1)   the user abandons a procedure in any state or the user hangs up during or after a prompt;

2)   the user is released by the IN-node.

The organization of the release sequence is given in the block diagram of figure 10.

1 ↓	2 ↓
User initiated release f.11	Network initiated release f.12
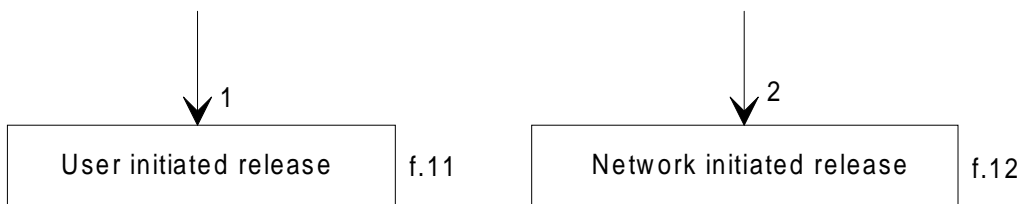
Figure 10: Release of the calling user

The release procedure generally includes:

-      the release of all external connections: lines, circuits;
-      the release of all engaged IN resources: Intelligent Peripheral (IP).

User initiated release

- - - - - - - - - - - - - - - - - - - originating network - - - - - - - -> <- home network
ref.   USER   CCF/SSF   SCF   SRF   SDFo   SDFhA

1   release signal →

2   EVREPBCSM →

3   disconnect r.i. - - - →

4   ← - - - disconnect r.c.

5   APPLYCHGRPT →

6   Update →

7   Update Result ←
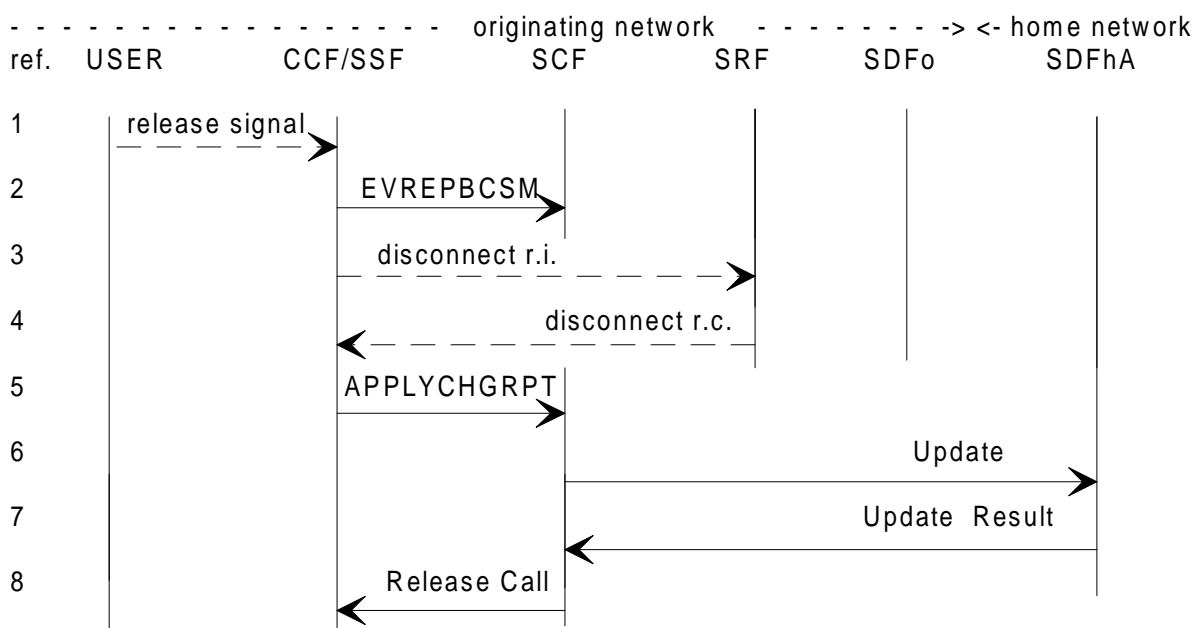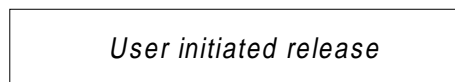
8   ← Release Call

Figure 11: A-user initiated release

	Network initiated release

- - - - - - - - - - - - - - - - originating network - - - - - - - - -> <- home network
ref. USER   CCF/SSF   SCF   SRF   SDFo   SDFhA

The SRF is connected

Option 1: implicit SRF disconnection

11   SRFRPT

12   disconnect r.i.

13   disconnect r.c.

==> go to 21

Option 2: explicit SRF disconnection

11a   SRFRPT

12a   DISCFWDCONN

13a   disconnect r.i.

14a   disconnect r.c.

==> go to 21

The SRF is not connected

21   Release Call

22   Release

23   APPLYCHGRPT

24   Update

25   Update Result

Figure 12: Network initiated release

Notes on release of the calling user.

IF ref.:

1, 2:   A release signal is received from the network and sent to the SCF.

3, 4:   When an SRF is connected, e.g. abandon during a prompt, SRF disconnection
                     is initiated by the CCF.
                     This sequence is network configuration dependent.

5-7: When an "ApplyCharging" has been issued, the record is returned to the SCF in a "ApplyChargingReport". The record may be sent to the SDFhA.

Other SDFs may also receive a record for e.g. split charging.
This function needs further study.

8: When an outgoing connection exists, the "Release Call" operation may be used. This sequence is network configuration dependent.

Option 1:

11: When a prompt is sent to the user e.g. after follow-on, network initiated disconnection may be triggered either after a time-out or a given number of prompt repetitions. In this case an "SRF Report" is sent to SCF to indicate that call disconnection may start.

12, 13: The disconnection of the SRF is initiated by the SRF itself. (this sequence is network configuration dependent).

Option 2:

11a: See 11.

12a-14a: SCF orders the disconnection of the SRF. (this sequence is network configuration dependent).

21, 22: This release sequence takes place when the SRF is not connected or when no prompt is given to the user. "Release Call" initiates the forced release of the user and the release of associated connections in the calling network.

NOTE: The release sequence of any possible outgoing connection is not shown.

23-25: See 5-7.

6 Personal mobility

The personal mobility procedures include:

- *registration for incoming calls;*

- *deregistration for incoming calls;*

- *reset for incoming calls.*

Personal mobility procedures may take place after other procedures, but are, at least, preceded by successful:

- *"Access, identification and authentication"* described in subclause 5.1; and

- *"Feature request identification"* described in subclause 5.2.

At this point the SCF has received the FC and orders the SRF to send a positive announcement to the user.

6.1 Registration for incoming calls

Prerequisite sequences: Access, identification and authentication
Feature request identification

The organization of the registration sequence is given in the block diagram of figure 13.

```
                              │
        ┌─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─│─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
        │                      ▼                        │
        │         ┌──────────────────────────┐         │
        ◄─────────┤  Prompts to the user     │ f.14    │
        │         └──────────────────────────┘         │
        │                      │            ◄───────────┤
        │                      ▼                        │
        │         ┌──────────────────────────┐         │
        ◄─────────┤ Registration for incoming call │ f.14, 15 │
        │         └──────────────────────────┘         │
        │               NOK         OK                  │
        │                │           │                  │
        │                ▼           ▼                  │
        │         ┌──────────────────────────┐         │
        ◄─────────┤  Prompts to the user     │ f.16    │
        │         └──────────────────────────┘         │
        │            NOK      OK      Retry ────────────┤
        │             │        │                        │
        └─ ─ ─│─ ─ ─ ─│─ ─ ─ ─│─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
              ▼ 3     ▼ 2      ▼ 1
       The user   The network   Follow-on
       abandons   releases the  Feature request identification
       the procedure  calling user
```
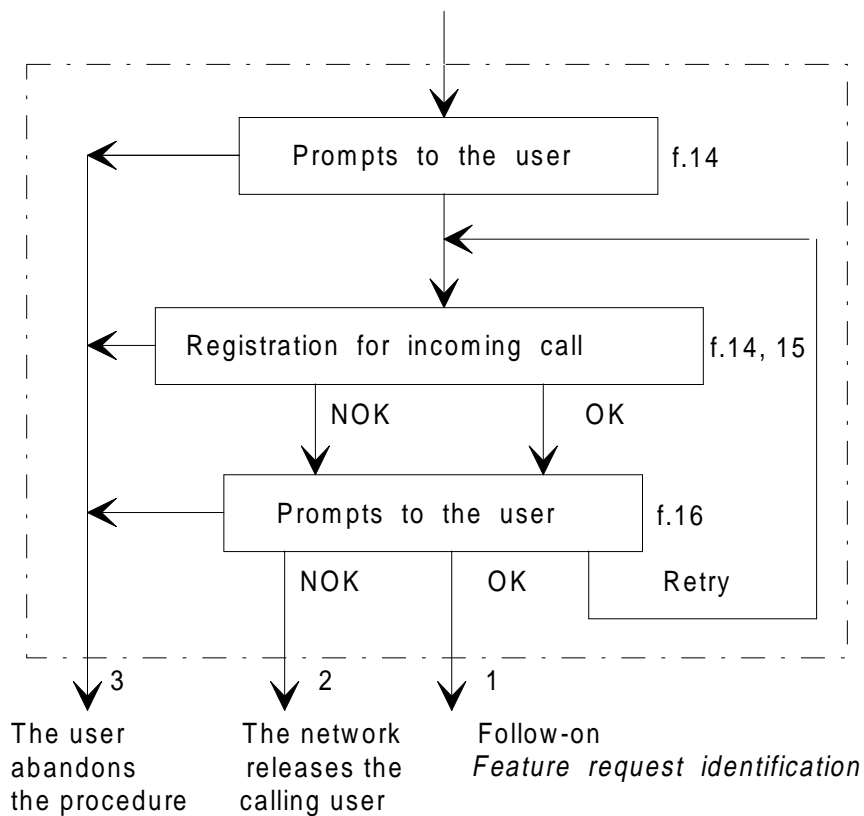
Figure 13: Registration for incoming calls

As an option, the procedure includes the possibility for the user to impose limitations/restrictions to the registration.

Prompts are given to the user according to allowed service options.

The logical outputs of the procedure are:

1)   OK: the user is allowed to request another feature (follow-on);
2)   NOK: the user is released by the network after a prompt (see note);
3)   the user abandons the request (in any state).

   NOTE: To prevent the service/network from being misused, e.g. abnormal number of retries after a request rejection, the network may release the user.

This function is carried out in the SCF.

Prompts and registration for incoming call

- - - - - - - - - - - - - - - - - - originating network - - - - - - - - -> <- home network
ref. USER   CCF/SSF   SCF   SRF   SDFo   SDFhA
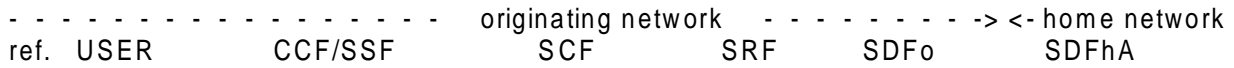
1) In a network with automatic Calling Line Identification:

1   P&C

"You are at terminal aaaa. Do you want to
 register at that terminal? Enter YYY to confirm,
2 NNN to cancel or ESC to make another request"

3   "user acknowledgement"

4   COLL-UI
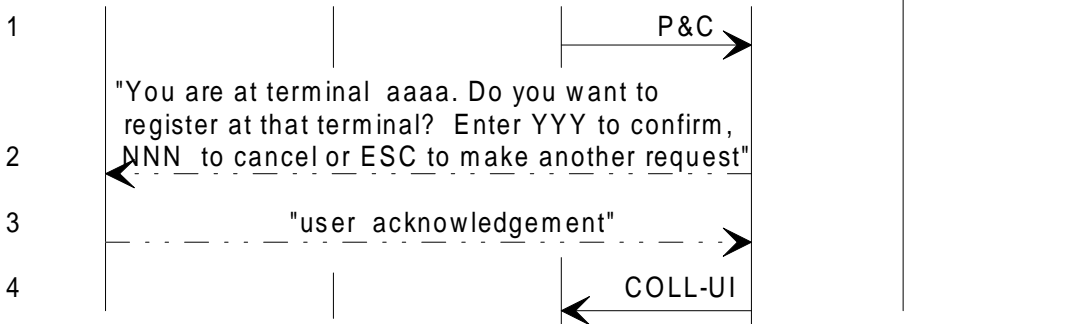
==> If the entry is NNN go to 6, else go to 5:

5   **FURNCHGINFO**
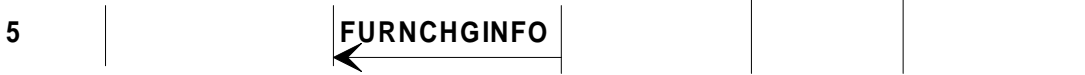
==> If the entry is YYY go to 15, if the entry is ESC go to 61.
==> If the maximum number of cancelled attempts is reached go to 91.

2) In a network with no Calling Line Identification:

6   P&C

7   "Please enter terminal number"

8   Terminal number (#)

9   COLL-UI

10   P&C

"You want to register at terminal aaaa?
  Enter YYY to confirm, NNN to cancel and make
11   another try or ESC to make another request"

12   "user acknowledgement"

13   COLL-UI

14   FURNCHGINFO
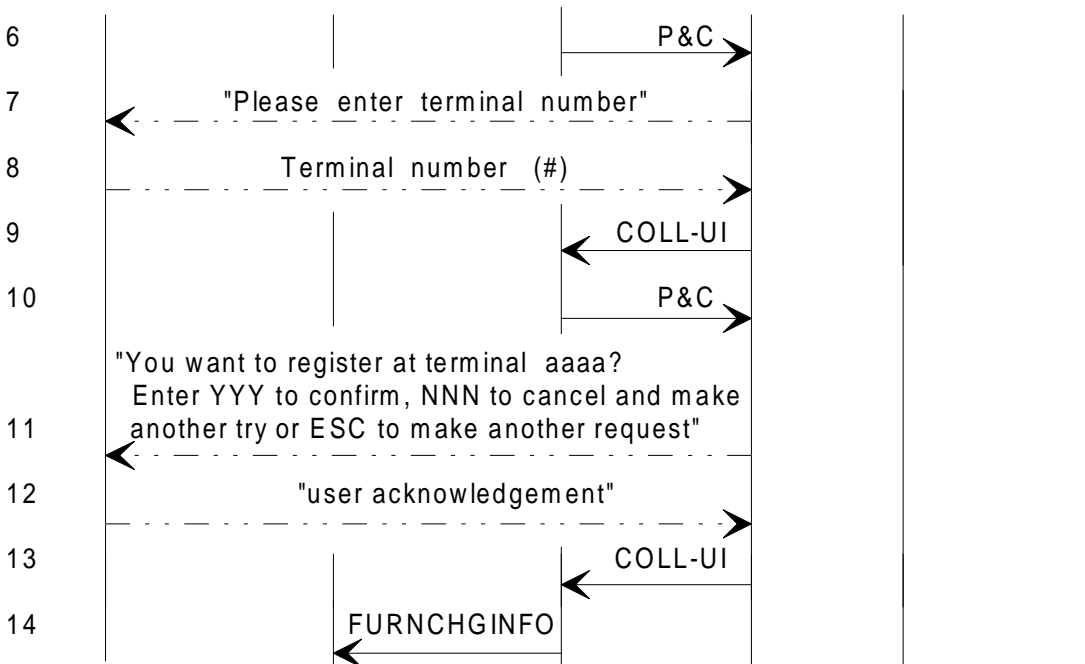
==> If the entry is YYY go to 15,
==> If the entry is NNN go to 71,
==> If the entry is ESC go to 61,
==> If the maximum number of cancelled attempts is reached go to 91.

Figure 14 (sheet 1 of 2): Prompts and registration for incoming calls

---

Registration for incoming calls (cntd)

- - - - - - - - - - - - - - - - - originating network - - - - - - - - - -> <- home network

ref.	USER	CCF/SSF	SCF	SRF	SDFo	SDFhA

15   Search →

16   ← Search Result
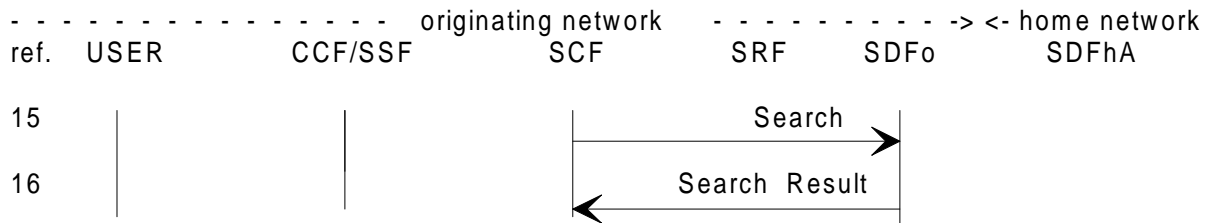
==> If check is successful go to 21, else go to 17:

17   FURNCHGINFO ←

==> If the maximum number of rejected attempts is reached go to 91,
==> else a new manual registration attempt is allowed go to 51.

Registration limitation sequence:

21   P&C →

22   ← "Please enter registration limitation sequence"

23   * C * XXXX (#) →

24   ← COLL-UI

25   P&C →

26   ← "Enter YYY to confirm, NNN to cancel and make
               another try, or ESC to make another request"

27   "User acknowledgement" →

28   ← COLL-UI
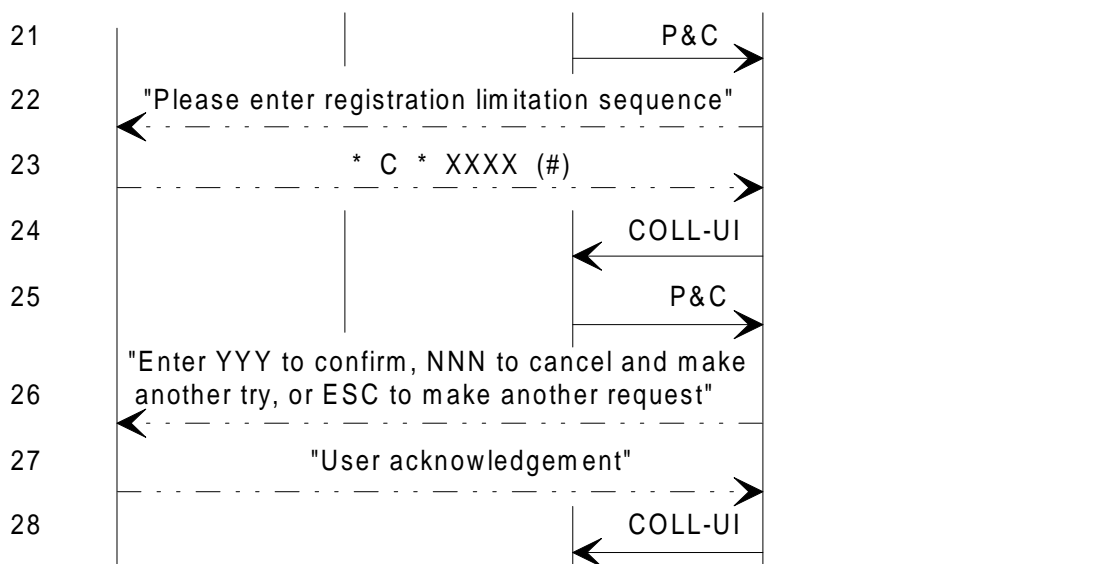
==> If the entry is YYY go to 29,
==> If the entry is NNN go to 81,
==> If the entry is ESC go to 61,
==> If the maximum number of rejected attempts is reached go to 91.

29   PLAYANN →

31   ← "your request is being processed, please wait"

32   Update →

33   ← Update Result

34   FURNCHGINFO ←
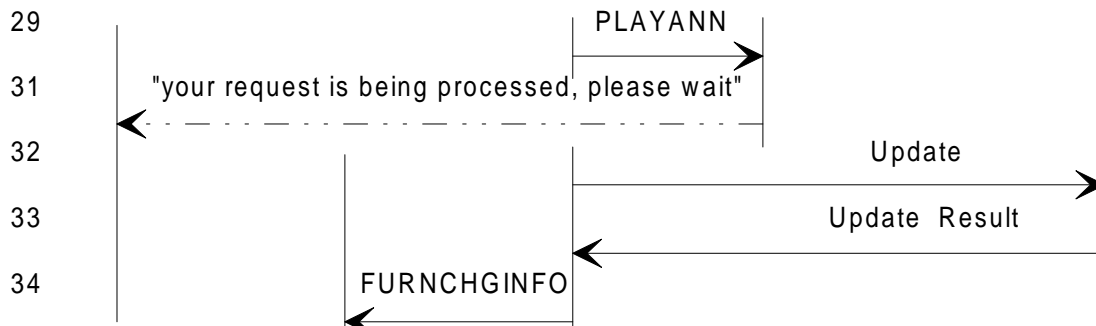
==> If registration is successful go to 41
==> If the maximum number of rejected attempts is reached go to 91,
==> else go to 101.

Figure 14 (sheet 2 of 2): Prompts and registration for incoming calls

		Prompts to the user	

ref.	USER	CCF/SSF	SCF	SRF

41 ──────────────────────────── P&C ──────►

42 ◄╴╴╴ "Your are now registered at terminal aaaa
you may identify another request or terminate" ╴╴╴

Logical output 1: ==> go to another procedure;
Logical output 2/3: ==> go to *Release of the calling user*

51 ──────────────────────────── P&C ──────►

52 ◄╴╴╴ "Unauthorised registration number,
retry with valid information" ╴╴╴

Retry: go to 8

61 ──────────────────────────── P&C ──────►

62 ◄╴╴╴ "Your request is cancelled (after ESC),
identify another request or terminate" ╴╴╴

Logical output 1: ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

71 ──────────────────────────── P&C ──────►

72 ◄╴╴╴ "Your request is cancelled, retry with valid information" ╴╴╴

Retry: go to 8

81 ──────────────────────────── P&C ──────►

82 ◄╴╴╴ "Your request is cancelled, retry with valid information" ╴╴╴

Retry: go to 23

91 ──────────────────────── PLAYANN ──────►

92 ◄╴╴╴ "Maximum number of retries exceeded, please hang up" ╴╴╴

Logical output 2/3: ==> go to *Release of the calling user*

101 ──────────────────────────── P&C ──────►

102 ◄╴╴╴ "Invalid input, retry with valid information" ╴╴╴

Retry: go to 23

NOTE: After any prompt the user may abandon: logical output 3, or not react within a given time: logical output 2.

Figure 15: Prompts to the user

Notes on registration for incoming calls.

IF ref.:

1-5:

When Calling Line Identification (CLI) is available in the network the user must first confirm whether registration will be at that terminal or not. If yes, or in case of Escape, the "FurnishChargingInformation" is sent to instruct SSF to update the record. If not the procedure is the same as when no CLI is provided.

6-9:

The user is prompted to enter terminal number. This can be given in different ways, depending on network capabilities. Usually a country code and a subscriber number are required. (Only the country code of the home country or of the visited country are allowed). A flag (#) may be used to indicate end of terminal identity.

10-13:

The given terminal number is echoed and the user is requested to confirm (or reject). The SRF sends the response to the SCF.
According to user input, terminal identification may be repeated or abandoned.

14:

The "FurnishChargingInformation" is sent to instruct SSF to update the record.

15, 16:

The SDFo is queried to check if any restrictions apply to the use of the given terminal number.

:

If the registration is denied a negative reply is sent to the SCF.

17:

See 14.

21,22:

The user is offered to enter a sequence of information to limit/restrict the registration.

23-28:

The sequence contains a code (C) which indicate the nature of the limitation e.g. period of time, date, default limitation stored in the service profile or no limitation. The necessary parameters are given in a following block (XXXX). A separator * is dialled between the two blocks.

The sequence is echoed to the user for confirmation.
According to user input, the limitation sequence may be repeated (sequence (71,72 and 23-28) or abandoned (ESC).

NOTE 1:   The originating network makes only a format check on the received sequence.

29-33:

The SDFhA is queried to check if the given terminal number does not violate any restrictions and is updated with the new location. If the registration is denied a negative reply is sent to the SCF. A waiting prompt is given to the user.

NOTE 2:   Validation of the terminal number is for further study.

34:

See 14.

41, 42 :

When registration is completed successfully, the user may want another UPT feature. For this purpose the user may identify another feature request (follow-on).

51, 52:

The SRF prompts the user that registration was rejected, another valid terminal identity could be input again.

61, 62:

When the user cancels the request another feature request may be input (follow-on).

71, 72:

After a negative acknowledgement, the SRF prompts the user that terminal number could be input again.

81, 82: After a negative acknowledgement, the SRF prompts the user that limitation sequence could be input again.

91, 92: The SRF prompts the user that the maximum number of rejected requests is reached. The count of the number of attempts is done in the SCF. The user is asked to hang up.

101, 102: The SRF prompts the user that registration was rejected, another valid terminal identity could be input again.

6.2 Deregistration for incoming calls

Prerequisite sequences: Access, identification and authentication
Feature request identification

The organization of the deregistration sequence is given in the block diagram of figure 16.
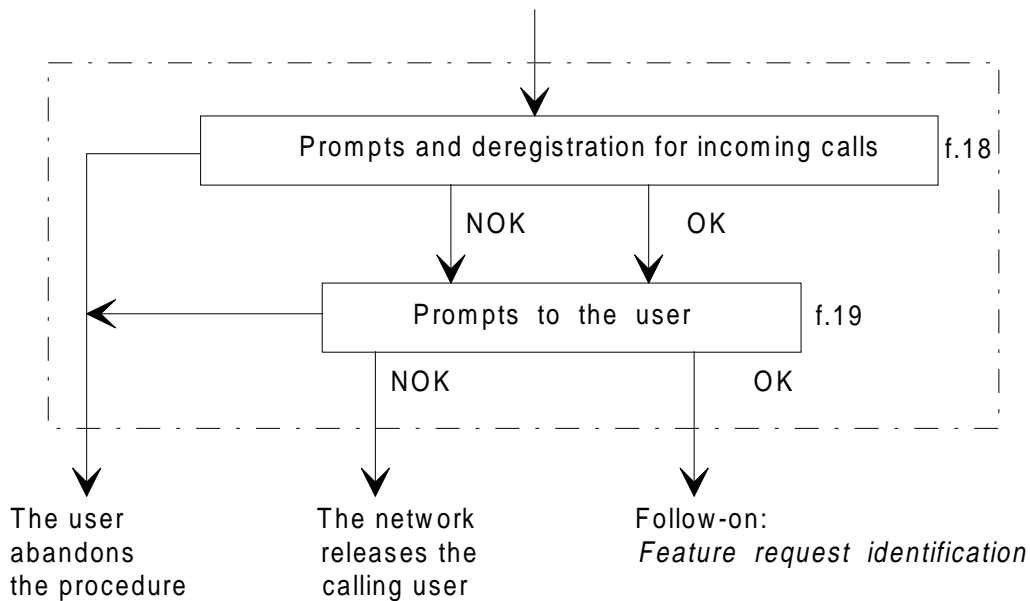
Figure 16: Deregistration for incoming calls

Prompts are given to the user according to allowed service options.

The logical outputs of the procedure are:

1) OK: the user is allowed to request another feature (follow-on);
2) NOK: the user is released by the network after a prompt (see note);
3) the user abandons the request (in any state).

NOTE: To prevent the service/network from being misused, e.g. abnormal number of retries after a request rejection, the network may release the user.

This function is carried out in the SCF.

```
┌─────────────────────────────────────────────────────┐
│       Prompts and deregistration for incomings calls │
└─────────────────────────────────────────────────────┘
```

- - - - - - - - - - - - - - - originating network - - - - - - - - -> <- home network
ref.   USER   CCF/SSF   SCF   SRF   SDFhA

1   ├──────────────── Search ──────────────────►│
                                       │
2   │◄─────────────── Search Result ───────────│
                                       │
3   │   P&C
                                       ├───────────────────►│
       "Please confirm deregistration from terminal aaaa,
        enter YYY to confirm, NNN to cancel or ESC to
4   make another request"
       ◄─ ┤
                                                    │
5   "User acknowledgement of the deregistration"
        ─►
                                                    │
6   │◄── COLL-UI ─┤
                                       │

==>   If the entry is YYY go to 8, if NNN or ESC go to 7:

7   │ FURNCHGINFO │
                        │◄────────────┤

==>   If the maximum number of rejected attempts is reached go to 51
==>   else go to 31

8   │   PLAYANN │
                                       ├─────────────►│
9   "your request is being processed, please wait"
        ◄─ ┤
                                       │
10   ├─────────── Update ────────────────────────►│
                                       │
11   │◄────────── Update Result ─────────────────│
                                       │
12   │ FURNCHGINFO │
                        │◄─────────────┤

==>   If deregistration is successful go to 21
==>   If the maximum number of rejected attempts is reached go to 51
==>   else go to 41
```

**Figure 17: Prompts and deregistration for incoming calls**

┌─────────────────────────┐
│    *Prompts to the user*    │
└─────────────────────────┘

ref.     USER          CCF/SSF            SCF              SRF

21                                                    P&C

"You are no longer registered at terminal aaaa,
 default registration will now apply;
22      identify another request or terminate "

Logical output 1: ==> go to relevant procedure,
Logical output 2/3: ==> go to *Release of the calling user*

Cancelled or denied request

31                                                    P&C

        "Your request is cancelled,
32        identify another  request or terminate"

Logical output 1:  ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

41                                                    P&C

42      "Unsuccessful attempt, your request cannot be handled,
         identify another request or terminate"

Logical output 1:  ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

51                                                  PLAYANN

52      "Maximum number of retries exceeded,  please hang up"

logical output 2/3: ==> go to *Release of the calling user*

NOTE:        After any prompt the user may abandon: logical output 3, or not react within a given time:
             logical output 2.

**Figure 18: Prompts to the user**

**Notes on deregistration for incoming call.**

IF ref.:

| | |
|---|---|
| 1,2: | The data retrieval may be necessary to obtain the current registration of the user (to prompt the user accurately). |
| 3-6: | The user is prompted to confirm or cancel deregistration. User acknowledgement is received in the SCF. |
| 7: | The "FurnishChargingInformation" operation is sent to instruct SSF to update the record. |
| 8-11: | When the user validates the deregistration, the SDFhA is updated. A waiting prompt is given to the user. |
| 12 : | See 7. |
| 21, 22 : | SRF is ordered to give the user a positive acknowledgement. When deregistration is completed successfully, the user may want another UPT service (e.g. an outgoing call). For this purpose the user may make a new feature request. |
| 31, 32: | When deregistration is not confirmed by the user the user is requested to hang up or to make another feature request. |
| 41, 42: | When deregistration is not accepted by the home network for any reason e.g. no prior registration (if this has not been checked during *Feature request identification*), the user is requested to hang up or to make another feature request. |
| 51, 52: | The SRF prompts the user that the maximum number of rejected requests is reached. The count of the number of attempts is done in the SCF. The user is asked to hang up. |

## 6.3 Reset for incoming calls

In phase 1 this feature is only provided by administrative procedures.

A call is made to the local UPT service provider who then handles the request off line.

# 7 Call handling

## 7.1 Outgoing UPT call

This is a call from a UPT user possibly roaming i.e. not registered in the network from where he/she is calling. The called number may be any number.

Prerequisite sequences:     Access, identification and authentication
                            Feature request identification

```
                    ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
                    │                        │                    │
                    │        ┌───────────────▼──────────────┐     │
                    │        │ Prompts, Outgoing call request and checks │  f.21
                    │        └──────────────────────────────┘     │
                    │  OK,  UPT Call              OK         NOK   │
                    │        ┌──────────────┐                      │
                    ◄────────│  UPT  Prompt  │  f.22              │
                    │        └──────────────┘                      │
                    │        ┌──────────────────────────┐          │
                    ◄────────│      Call  attempt        │  f.23   │
                    │        └──────────────────────────┘          │
                    │                              NOK             │
                    │         CONVERSATION                         │
                    │                                              │
                    │  A - release ┌─────────────┐                 │
                    ◄──────────────│  B - release │  f.24          │
                    │              └─────────────┘                 │
                    │        ┌──────────────────────────┐          │
                    ◄────────│   Prompts  to  the  user  │  f.25   │
                    │        └──────────────────────────┘          │
                    │              NOK                             │
                    └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
                         ▼              ▼               ▼
                         3              2               1
```

The A-user releases   The network   Follow-on:
or abandons   releases the   *Feature request identification*
the procedure   calling user

Figure 19: Outgoing UPT call

Prompts are given to the user according to allowed service options.

The logical outputs of the procedure are:

1)   the user is allowed to request another feature (follow-on);
2)   the user is released by the network after a prompt;
3)   the user abandons the request before call set-up or hangs up during call set-up or conversation or
while being prompted after call attempt.

Prompts, Outgoing call request and checks

- - - - - - - - originating network - - - - - - - - - - - - - -> <-- Calling user's
home network

| Ref. | USER | CCF/SSF | SCF | SRF | SDFo | SDFhA |

1   P&C

2   "Please dial the destination number"

3   (*) destination number (#)

4   COLL-UI

5   Search

6   Search Result

==> If the call request is rejected go to 81
==> else if the B-number is: - a UPT number: go to 7
- not recognized as a UPT number: go to 11

7   Search

8   Search Result

==> If the call request is rejected go to 81, else go to 9:

Called UPT user's
home network
SDFhB

9   Search

10   Search Result

==> If the call request is rejected go to 81, else go to 21
==> After 6, 8, and 10 if the maximum number of rejected attempts is reached go to 101

11   DISCFWDCONN

12   disconnect r.i.

13   disconnect r.c.

==> Go to: 31

NOTE: Not recognized as a UPT number means:

-    the B-number is not a UPT number;
-    the B-number is a UPT number but the call will be routed over the B-user's home
network; the B-user's location will be retrieved by the B-user's home network.

Figure 20: Prompts, Outgoing call request and checks

```
┌─────────────────────────────────────────────────┐
│     UPT charging announcement to the user        │
└─────────────────────────────────────────────────┘

  Ref.   USER      CCF/SSF         SCF          SRF

                                        PLAYANN
  21                                    ─────────────►

  22          ◄─ · · · · ·  "UPT charging is applicable"

                                        SRFRPT
  23                            ◄─────────────

                                disconnect r.i.
  24              ◄─ ─ ─ ─ ─ ─ ─ ─ ─
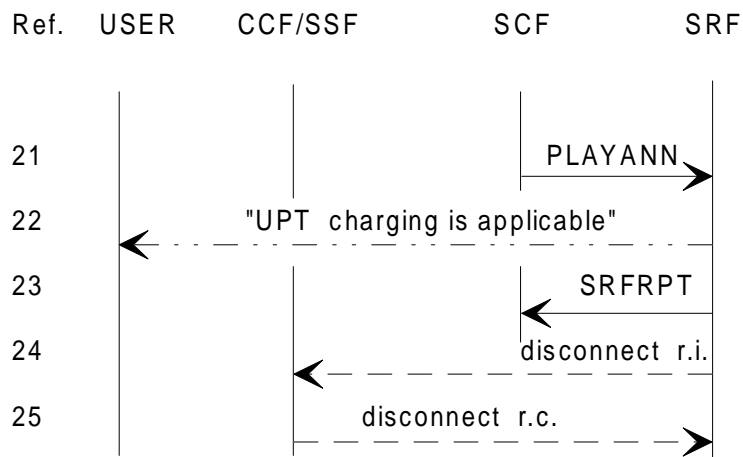
                     disconnect r.c.
  25              ─ ─ ─ ─ ─ ─ ─ ─ ─►
```

==> If the user hangs up, go to the *Release of the calling user* (figure 11)
==> else go to 31

Figure 21: UPT charging announcement

```
                          ┌──────────────────────────┐
                          │      Call attempt        │
                          └──────────────────────────┘

Ref.  USER      CCF/SSF           SCF           SRF

31                │◄─────REQREPBCSM───│            │

32                │◄─────FURNCHGINFO──│            │

33                │◄──────APPLYCHG────│            │

34                │◄──────Connect─────│            │

35                │ ──Forward cal set-up message e.g.: IAM ──►
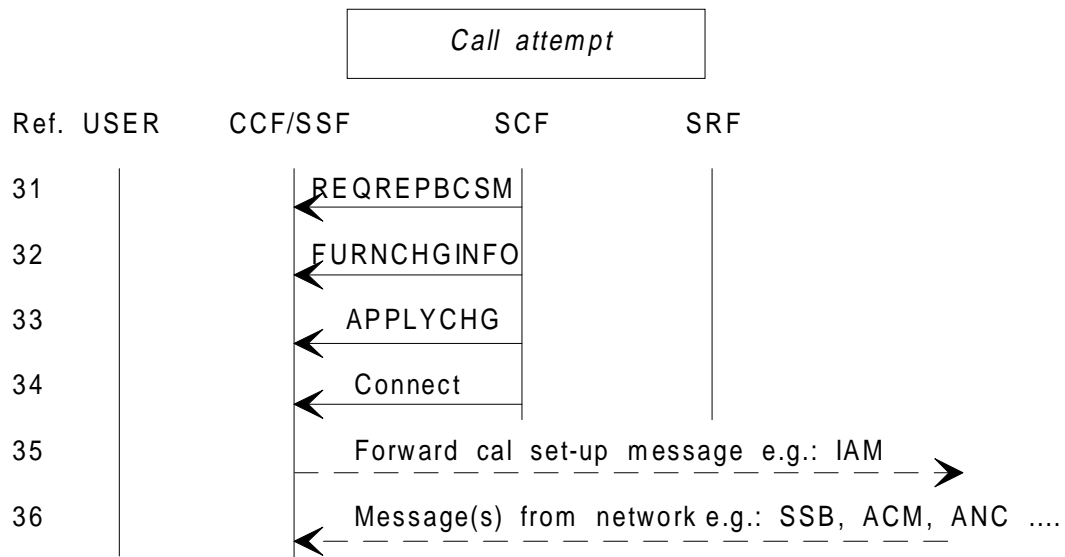
36                │◄──Message(s) from network e.g.: SSB, ACM, ANC ....──
```

==> On busy, congestion or no-answer go to 37
==> When call set-up is successful:

<div align="center">C O N V E R S A T I O N</div>

The called user hangs up first: go to 51
The calling user hangs up first: go to the *Release of the calling user* (figure 11)

```
37                │   EVREPBCSM──────►│            │
```

==> On busy or no-answer go to 38, else go to 40

```
                                                   SDFhB
38                │        │          │───Search──────►│

39                │        │          │◄──Search Result─│
```

==> If call forwarding is activated, a redirected call attempt is made: go to 31, else go to 40

```
40                │◄──────ETC─────────│            │

41                │ ──────setup r.i.──────────────►│

42                │◄──────setup r.c.───────────────│
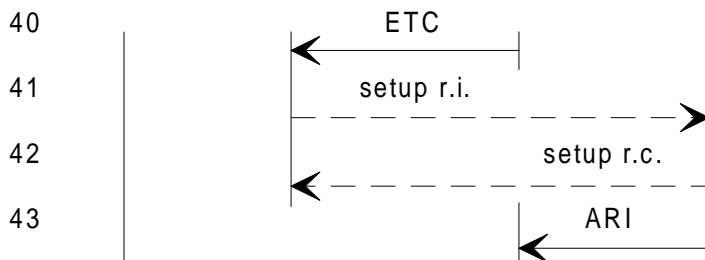
43                │◄──────ARI─────────│            │
```

==> go to 91

Figure 22: Call attempt

```
                          ┌─────────────────────────┐
                          │        B - release        │
                          └─────────────────────────┘


- - - - - - - - originating network - - - - - - - - - - -> <-- home network
Ref. USER      CCF/SSF           SCF           SRF           SDFhA

51                         End of conversation  e.g. CBK  from network
                      <─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─

52                         Forward release sequence e.g.: CLF
                      ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─>

53         EVREPBCSM
                      ──────────────>

54         FURNCHGINFO
                      <──────────────

55         APPLYCHGRPT
                      ──────────────>

56                                            Update
                                      ──────────────────────────>

57                                          Update  Result
                                      <──────────────────────────

58              ETC
                      <──────────────

59         setup  r.i.
                      ─ ─ ─ ─ ─ ─ ─ ─ ─ ─>

60                         setup  r.c.
                      <─ ─ ─ ─ ─ ─ ─ ─ ─ ─

61                              ARI
                                      <──────────────
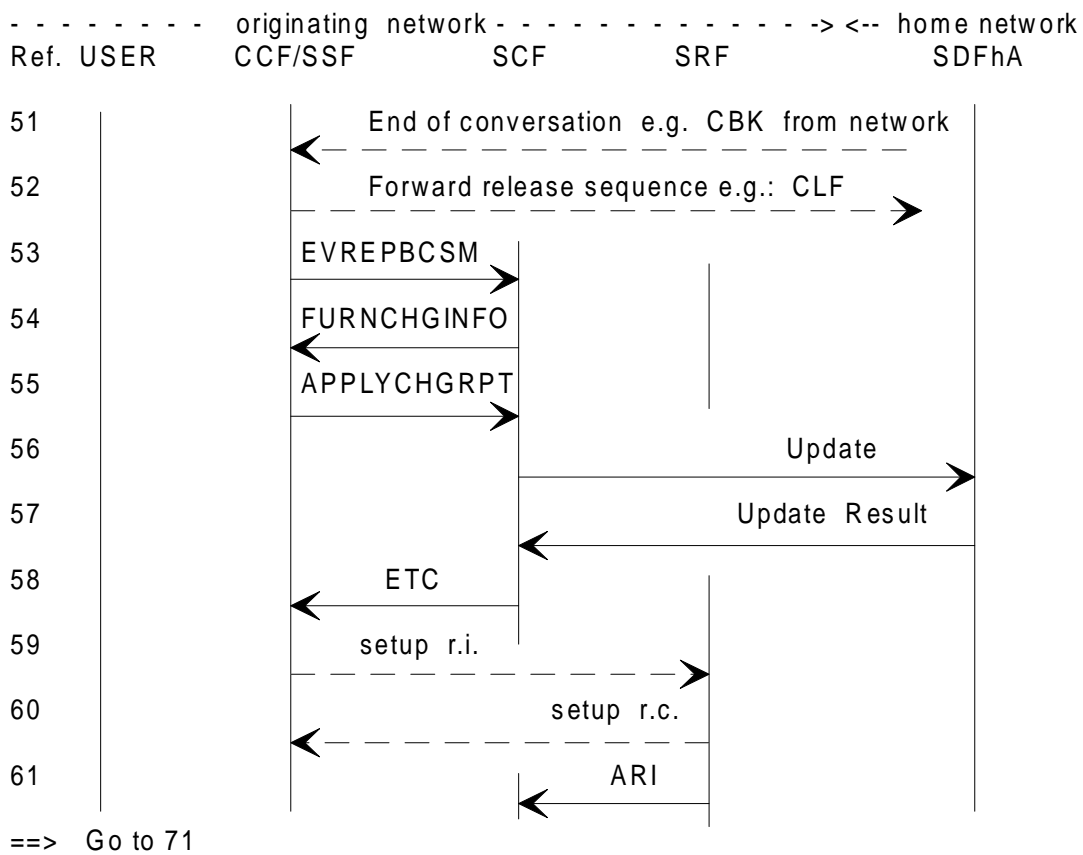
==>  Go to 71
```

Figure 23: B-release with follow-on

Prompts to the user

ref.   USER   CCF/SSF   SCF   SRF

71 ┊ ┊ P&C

72 "Identify another request or terminate"

Logical output 1:   ==> go to another procedure (e.g. follow-on)
Logical output 2/3: ==> go to *Release of the calling user*

81 FURNCHGINFO

82 P&C

"Unauthorised outgoing number, your request cannot
83 be handled, identify another request or terminate"

Logical output 1:   ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

91 FURNCHGINFO

92 P&C

"Unsuccessful call, your request cannot be handled,
93 identify another request or terminate"

Logical output 1:   ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

101 FURNCHGINFO

102 PLAYANN

103 "maximum nb. of retries exceeded, please hang up"

Logical ouput 2/3: ==> go to *Release of the calling user*

Figure 24: Prompts to the user

Notes on outgoing call.

IF ref.:

Assumption: The SCF recognizes UPT numbers and controls call set-up.

1-4:	The B-number can be given in different ways, depending on networks. At most, the international significant number is required.
	The dialled number can be any number, also a UPT number. The digits are echoed (the user can abandon the procedure by hanging up).
	A flag (#) may be dialled to indicate the end of the destination number.
	The SRF sends the number sequence to the SCF.
	The B-number is analysed in the SCF.
5, 6:	The SDFhA is queried to check if particular restrictions apply to the dialled number.
7, 8:	SDFo is queried to check if there exist particular agreements between the local service provider and the called user's home provider for establishing outgoing calls.
9, 10:	The SDFhB query is made to retrieve the location of the called user and the charging reference point. Particular restrictions may also be checked in SDFhB when necessary.
11-13:	SSF is ordered to release the SRF.
21, 22:	The user is informed that particular charging conditions may apply. The user is thus given the opportunity to abandon the call (for further study).
23-25:	When the announcement is played, disconnection of the SRF takes place. (SRF initiated disconnection).
31:	The SSF is required to suspend processing at given detection points (such as call-back after a successful call or on busy, congestion and no answer).
32:	The "FurnishChargingInformation" operation is sent to instruct SSF to create a call record for the following call attempt.
33:	"ApplyCharging" could also be sent. (This operation is not necessary if an earlier request is pending).
34:	The SSF is required to set up the call.
35, 36:	SSF routes the call accordingly and receives backward signalling.
37:	When the call is unsuccessful the SCF is informed. The no answer event is generated by an application timer in the SSF.
38, 39:	If a busy or no answer indication is received, a request is made to the B-user's home data base to check whether the call forwarding service is activated. If call forwarding is activated, the redirection address is retrieved and a new call attempt is made.

40-43:   When the call set-up is unsuccessful or when the request is denied, it may be necessary to reconnect the SRF.

                                Several SRF connection scenarios are possible as described in ***Access and Prompts*** (subclause 5.1).

51-53:   The called party ends the conversation. SSF initiates an immediate disconnection sequence of the forward circuit. The disconnection sequence is network dependent.

                                SSF reports to SCF.

54:                    The "FurnishChargingInformation" operation is sent to instruct SSF to update the record.

       NOTE: For the purpose of the follow-on, the creation of a new record is done when the user places a new request (see feature identification ref. 7).

55-57:   Since an "ApplyCharging" has been issued, the record is returned to the SCF.

                                The record is sent to the SDFhA and, in case of UPT to UPT call, to the SDFhB.

                                This function needs further study.

58-61:   To offer the follow-on, the SCF orders the SSF to reconnect an SRF.

                                Several SRF connection scenarios are possible as described in ***Access and Prompts*** (subclause 5.1).

71, 72:   SRF is ordered to prompt the calling user, which is given the opportunity to place another service request.

81:                     See 54.

82, 83:   The calling user is informed that the dialled B-number is not authorized and is requested to hang up or to make another feature request.

91:                     See 54.

92, 93:   The calling user is informed that the call is unsuccessful and is requested to hang up or to make another feature request.

101:                 The "FurnishChargingInformation" operation is sent to instruct SSF to update the record.

102,103:   The SRF prompts the user that the maximum number of denied call attempts is reached. The count is done in the SCF.

                                The user is asked to hang up.

7.2 Incoming UPT call

This procedure deals only with calls generated by "non-UPT users".

In the following it is assumed that a call to a UPT user is always controlled from the "first" network with UPT capabilities.

This network may be either the originating network or the called user's home network or another network.

```
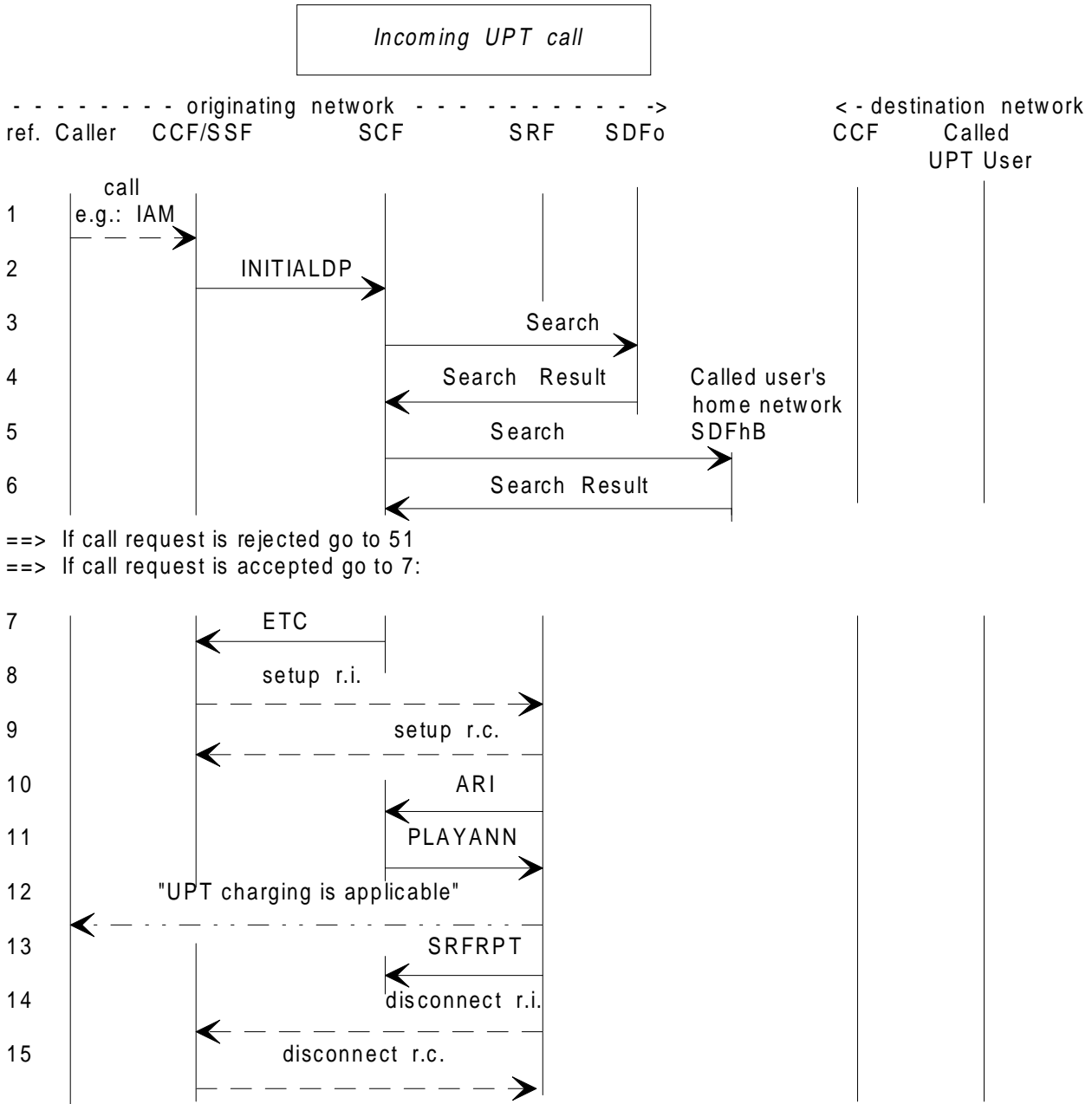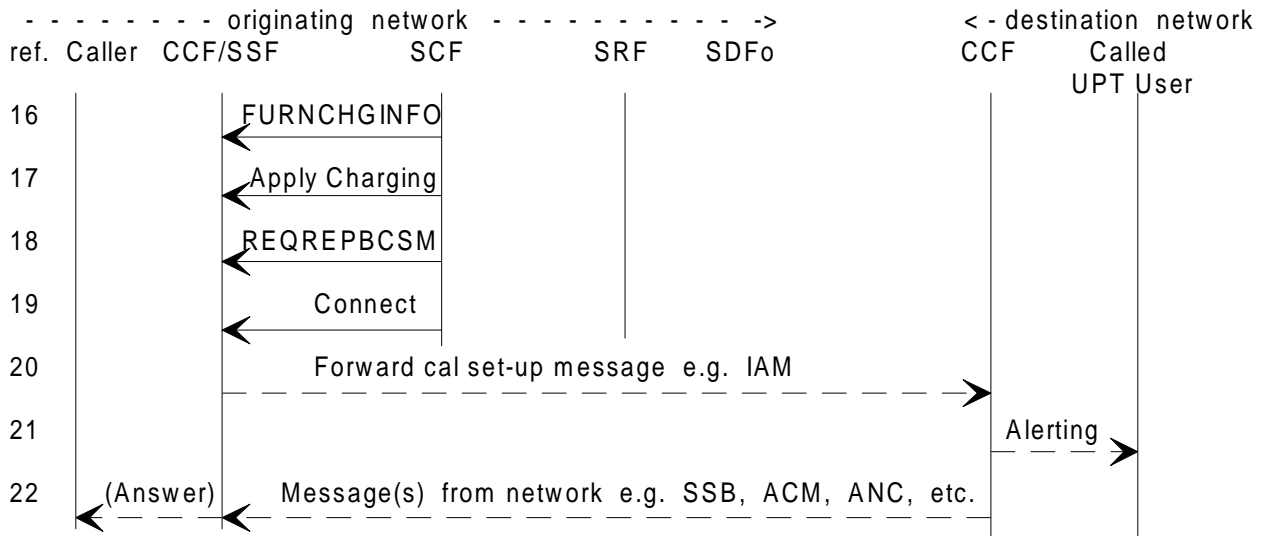                        ┌─────────────────────────────┐
                        │    Incoming  UPT  call       │
                        └─────────────────────────────┘

- - - - - - - - originating network - - - - - - - - ->        < - destination network
ref. Caller   CCF/SSF        SCF        SRF    SDFo            CCF      Called
                                                                       UPT User
              call
1    │  e.g.: IAM  ──▶│
2             │      INITIALDP   │
              │ ─────────────▶ │
3                           │   Search       │
                            │ ──────────────▶│
4                           │  Search  Result│        Called user's
                            │ ◀──────────────│        home network
5                           │      Search            SDFhB
                            │ ─────────────────────▶│
6                           │      Search  Result    │
                            │ ◀─────────────────────│
==> If call request is rejected go to 51
==> If call request is accepted go to 7:

7                  │      ETC       │
                   │ ◀──────────────│
8                  │    setup r.i.          │
                   │ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ▶│
9                  │      setup r.c.         │
                   │ ◀ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─│
10                          │      ARI        │
                            │ ◀──────────────│
11                          │    PLAYANN      │
                            │ ──────────────▶│
12          │   "UPT charging is applicable"  │
            │ ◀ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─│
13                          │     SRFRPT       │
                            │ ◀──────────────│
14                 │   disconnect r.i.       │
                   │ ◀ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─│
15                 │    disconnect r.c.      │
                   │ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ▶│
```

Figure 25 (sheet 1 of 3): Incoming UPT call

Incoming UPT call (cntd)

```
- - - - - - - - originating network - - - - - - - - - - ->      < - destination network
ref. Caller  CCF/SSF        SCF         SRF      SDFo            CCF      Called
                                                                          UPT User
```

16	FURNCHGINFO	
17	Apply Charging	
18	REQREPBCSM	
19	Connect	
20	Forward cal set-up message e.g. IAM	
21		Alerting
22	(Answer) Message(s) from network e.g. SSB, ACM, ANC, etc.	

==> On busy, congestion or no answer go to 51
==> When call set-up is successful:

C O N V E R S A T I O N
The calling user hangs up first: go to 41
The called user hangs up first: go to 31:

31	Release from network e.g. CLB	Release
32	Forward connection release: e.g. CLF	
33	FURNCHGINFO	
34	release	

==> If an APPLYCHGRPT is pending go to 45

41	release
42	Forward connection release: e.g. CLF
43	FURNCHGINFO
44	release

==> If an APPLYCHGRPT is pending go to 45:

45	APPLYCHGRPT	Called user home network
46	Update	SDFhB
47	Update Result	

Figure 25 (sheet 2 of 3): Incoming UPT call

Incoming UPT call (cntd)

- - - - - - - - originating network - - - - - - ->   < - destination netw.
Ref. Caller CCF/SSF   SCF   CCF   Called
                                                                   UPT User

51 | | EVREPBCSM |
==> On busy or no-answer go to 52, else go to 54

                                                        SDFhB
52 | | | Search
53 | | | Search Result
==> If call forwarded is activated go to 16, else go to 54

54 | | Release Call
55 | | FURNCHGINFO
56 | release |
57 | Forward connection release e.g.: CLF

Figure 25 (sheet 3 of 3): Incoming UPT call

Notes on incoming call.

IF ref.:

1, 2:   A received UPT number sequence triggers "Initial Detection Point".

3, 4:   The SDFo is queried to check if there exists particular agreements between the
                   local service provider and the called user's home provider for establishing
                   incoming calls.

5, 6:   The SDFhB query is made to retrieve the location of the called user and the
                   charging reference point.
                   Particular restrictions may also be checked in SDFhB when necessary.

7, 12:   After a connection to SRF the calling user is informed on particular charging
                   conditions that may apply.

13:                SRF reports when the announcement is played through.

14, 15:   Disconnection is initiated from SRF.

                   Several SRF connection scenarios are possible as described in Access and
                   Prompts, subclause 2.1.

       NOTE 1:   The usefulness of sequence 7-15 needs further study.

16:                The "FurnishChargingInformation" operation is sent to instruct SSF to create a
                   call record for the following call event.

       NOTE 2:   FurnishChargingInformation is used if call record is generated at SSF. Alternatively
                   "Apply Charging" may be used if the call record is generated at SCF.

17:                     Apply Charging may be necessary also to send metering pulses to the calling line.

18:                     SCF orders SSF to suspend call processing at given detection points (CLB, CLF).

19:                     SCF orders SSF to set up the call.

20, 21:   In the destination network a call attempt is made towards the user.

22:                     The result is received in the controlling SSF.

                        If the called user answers, this is received in SSF and sent backwards.

31:                     The call is terminated by the B party.

32-34:   After a timing (for re-answer) both forward and backward connections are released (network dependent signalling).

                        The "FurnishCharging" operation is sent to instruct the SSF to update the record.

41:                     The call is terminated by the A party.

42-44:   The forward and backward connections are released and an appropriate signal is sent backwards.

                        The "FurnishCharging" operation is sent to instruct the SSF to update the record.

45-47:   When an "APPLYCHGRPT" is pending the record generated in the SSF/CCF is returned to the SCF and transferred to the SDFhB.

                        Another record may also be sent to the originating network (SDFhA).

51:                     When the call is unsuccessful the SCF is informed.

52, 53:   If a busy or no answer indication is received, a request is made to the B-user's home data base to check whether the call forwarding service is activated.

                        If call forwarding is activated, the redirection address is retrieved and a new call attempt is made.

54-57:   In the case of a rejected or unsuccessful call attempt SSF releases the connections in both directions with an appropriate signalling sequence (Network dependent).

                        (In the case of a rejected call attempt SCF orders the release). The "FurnishCharging" operation is sent to instruct the SSF to update the record.

8 Service profile management

8.1 Service profile interrogation

In phase 1, in visited networks no guiding prompts can be offered to the user. Thus this feature is only provided by administrative procedures.

The user makes a call to the home UPT service provider who then handles the request.

8.2 Service profile modification

Prerequisite sequences: Access, identification and authentication
Feature request identification

The organization of the service profile modification sequence is given in the block diagram of figure 26.

Figure 26: Service profile modification

Prompts are given to the user according to allowed service options.

The logical outputs of the procedure are:

1) OK: the user is allowed to request another feature (follow-on);

2) NOK: the user is released by the network after a prompt (see note);

3) the user abandons the request (in any state).

NOTE: To prevent the service/network from being misused e.g. abnormal number of retries after a request rejection, the network may release the user. This function is carried out in the SCF.

Service profile modification

- - - - - - - - - - - - - - - - originating network - - - - - - - - - - - - -> <- home network
ref.　USER　　　　CCF/SSF　　　　SCF　　　　　SRF　　　SDFo　　　　SDFhA

1　　　　　　　　　　　　　　　　　　　　　　P&C

2　　　　　　　"Please enter your modification request"

3　　　　　　　"Service profile modification request e.g;
　　　　　　　　* serv. code * serv. component # "

4　　　　　　　　　　　　　　　　　　　　COLL-UI

5　　　　　　　　　　　　　　　　　　　　　P&C

6　　　　　　　"enter YYY to confirm, NNN to cancel
　　　　　　　　or ESC to make another request"

7　　　　　　　　　　"user acknowledgement"

8　　　　　　　　　　　　　　　　　　　　COLL-UI

==> If the entry is YYY, go to 9
==> If the entry is NNN, go to 31
==> If the entry is ESC, go to 41
==> If the maximum number of rejected attempts is reached: go to 61

9　　　　　　　　　　　　　　　　　　PLAYANN

10　　　　　　"your request is being processed, please wait"

11　　　　　　　　　　　　　　　　　　　　　　Update

12　　　　　　　　　　　　　　　　　　　　Update Result

13　　　　　　　　　　　FURNCHGINFO

==> If service profile modification is successful: go to 21
==> else the user is offered to make another request: go to 51
==> If the maximum number of rejected attempts is reached: go to 61

Figure 27: Service profile modification request

```
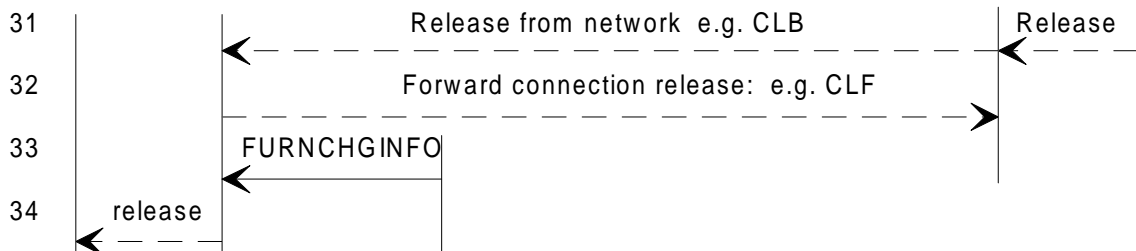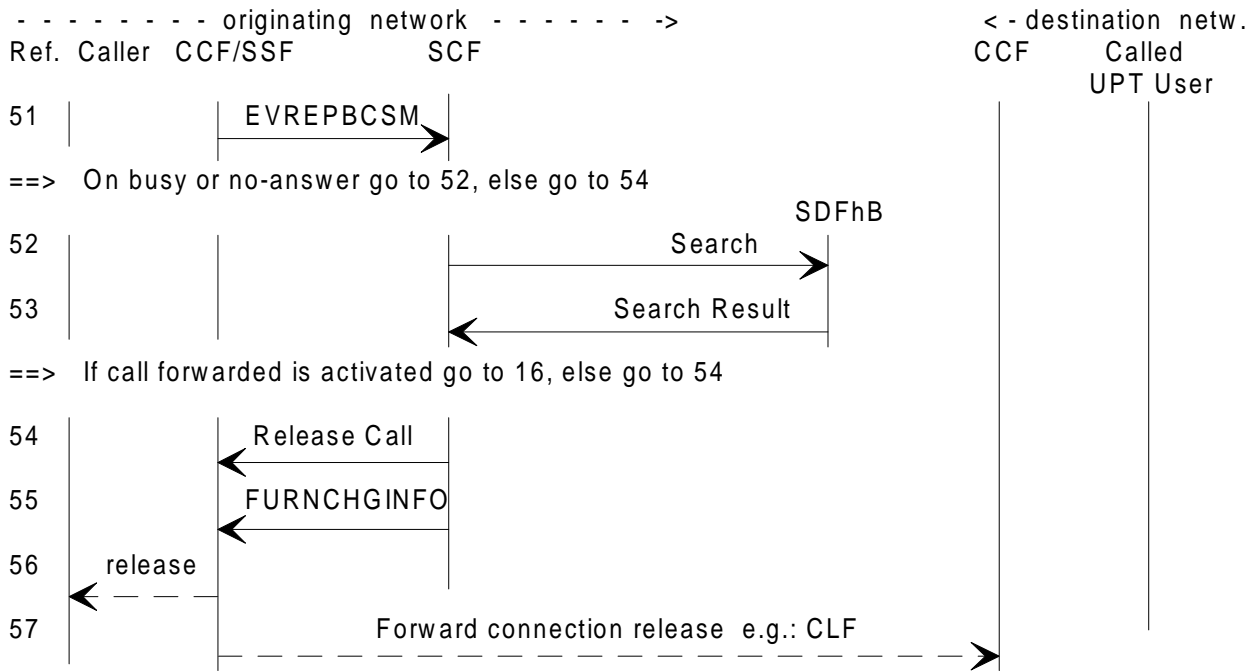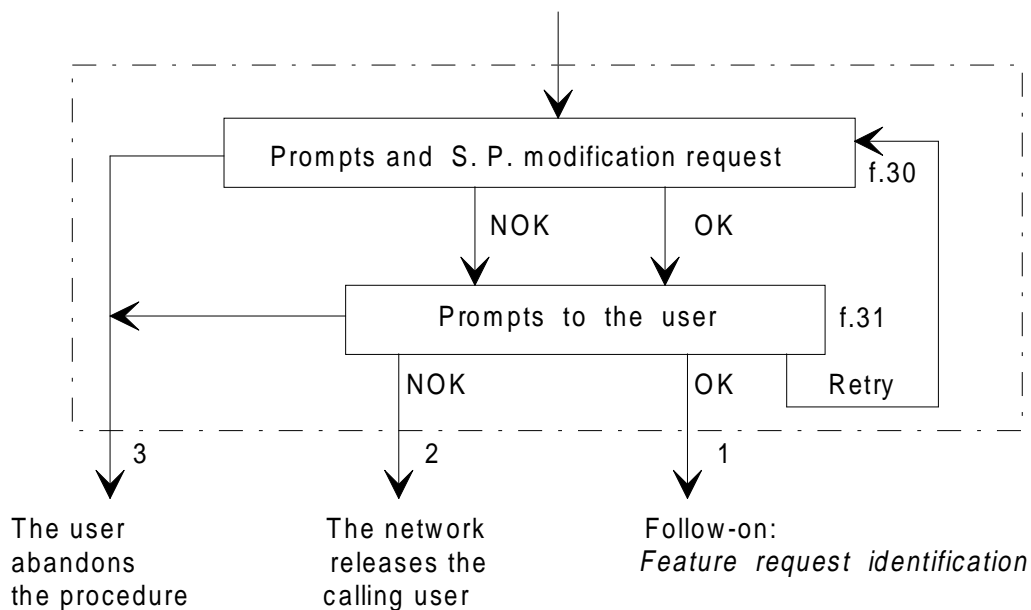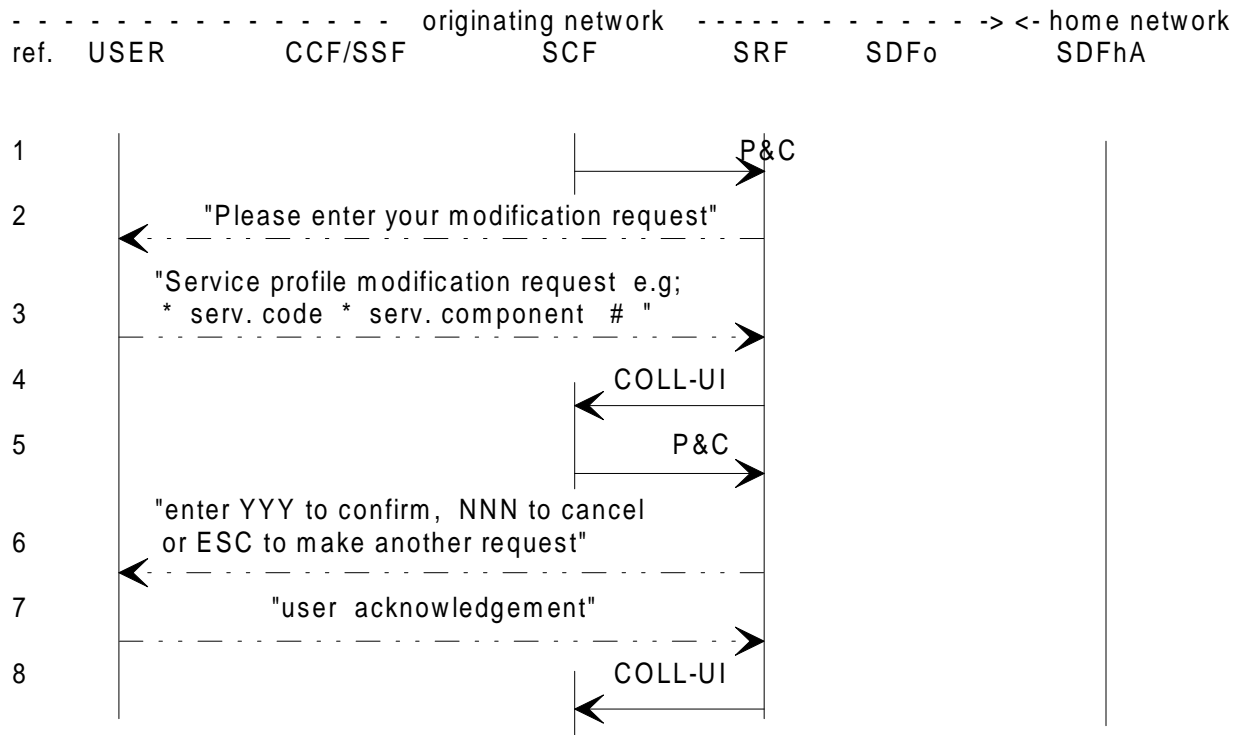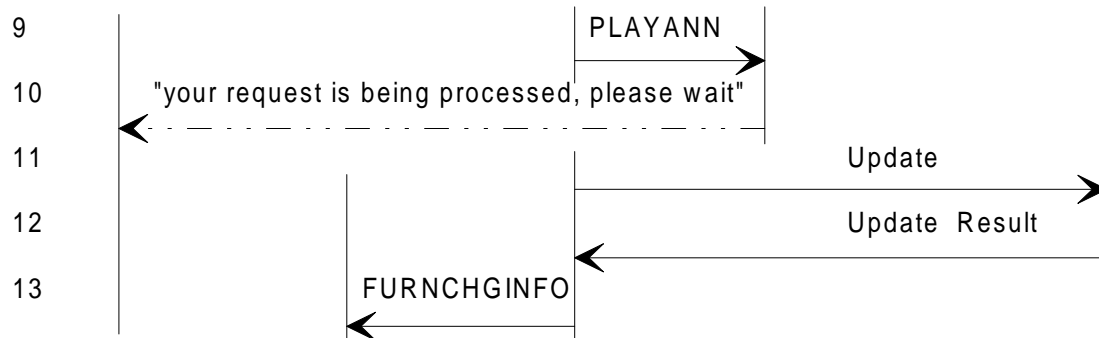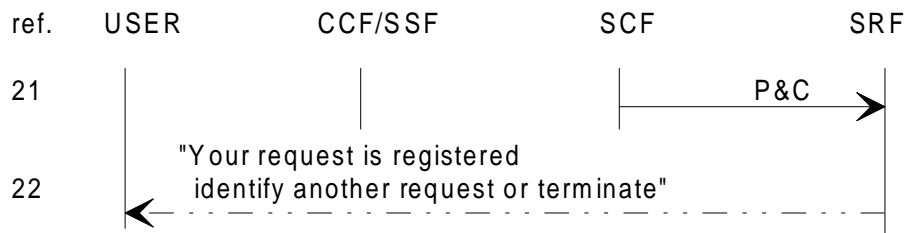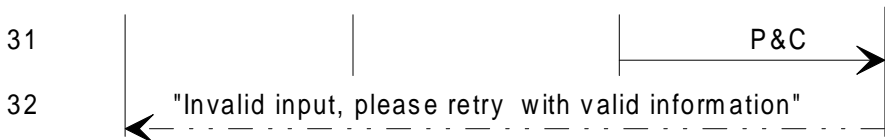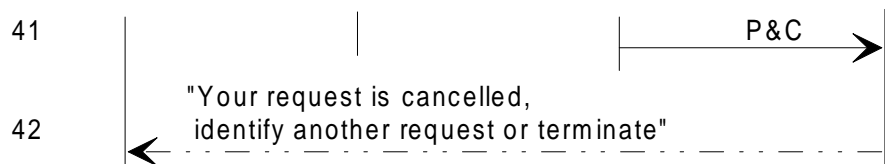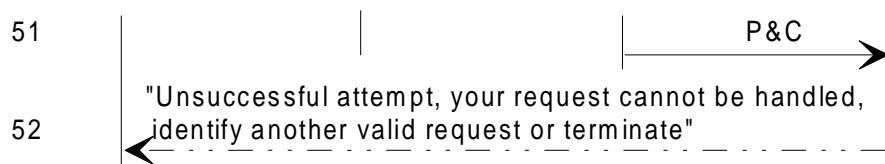                          ┌─────────────────────┐
                          │  Prompts to the user │
                          └─────────────────────┘
    ref.   USER        CCF/SSF            SCF              SRF

    21      │              │                │      P&C          →
            │              │                │─────────────────→│
            │        "Your request is registered
    22      │←──── identify another request or terminate"
            │←─────────────────────────────────────────────────│
```

Logical output 1: ==> go to another procedure;
Logical output 2/3: ==> go to *Release of the calling user*

```
    31      │              │                │      P&C          →
            │              │                │─────────────────→│
    32      │←───"Invalid input, please retry with valid information"
            │←─────────────────────────────────────────────────│
```

Retry: go to 3

```
    41      │              │                │      P&C          →
            │              │                │─────────────────→│
            │        "Your request is cancelled,
    42      │←────  identify another request or terminate"
            │←─────────────────────────────────────────────────│
```

Logical output 1:   ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

```
    51      │              │                │      P&C          →
            │              │                │─────────────────→│
            │     "Unsuccessful attempt, your request cannot be handled,
    52      │◄── identify another valid request or terminate"
            │◄─────────────────────────────────────────────────│
```

Logical output 1:   ==> go to another procedure
Logical output 2/3: ==> go to *Release of the calling user*

```
    61      │              │                │   PLAYANN         →
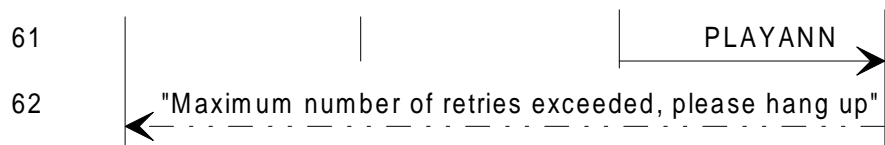            │              │                │─────────────────→│
    62      │◄──"Maximum number of retries exceeded, please hang up"
            │◄─────────────────────────────────────────────────│
```

Lgical output 2/3: ==> go to *Release of the calling user*

Figure 28: Prompt to the user

Notes on service profile modification.

IF ref.:

1-3: The user is prompted to enter the request which conforms to a specified structure.

4-6: The SRF is ordered to ask the user to confirm the request.

7,8: The user acknowledgement is required, received and sent to the SCF.

9-12: After user confirmation the service profile is updated in the home network.

13: The "FurnishChargingInformation" operation is sent to instruct SSF to update the record.

21, 22: Following to a successful request, the SRF is ordered to give the user a positive acknowledgement to the user who may require another UPT service (e.g. an outgoing call).

For this purpose the user will make a new feature request.

31, 32 When the user cancels the entry (NNN entry), he/she is invited to make another try.

41, 42: When the request is cancelled by the user (ESC), he/she is requested to hang up or to make another feature request.

51, 52 When the request is denied, the user is offered to make another valid request or to terminate.

61, 62: The SRF prompts the user that the maximum number of rejected requests is reached. The count of the number of attempts is done in the SCF.

The user is asked to hang up.

Annex A (informative): Procedures

Combined sequence

FC = NPIN
(#)

FC = NPIN
*
NPIN
*
NPIN
(#)

OK   NOK

Other
Procedure

NPIN
*
NPIN
(#)

Retry   NOK   OK

n   n' ?

y

Next
procedure

User release or
time-out and
network release

◀ —   = prompt to the user
( )   = character not mandatory
OK/NOK = system check
n'   = maximum number of attempts, e.g. 2

Figure A.1: PIN change procedure

Manual   Automatic

	= prompt to the user
( )	= character not mandatory
FRL	= forced released after a number of unsuccessful attempts (local protection)
YES/NO	= user acknowledgement
ESC	= escape code to return to procedure/feature identification
OK/NOK	= system check

Figure A.2: Combined authentication, PIN unblocking and PIN change procedures

FC = InCallReg
(#)

FC = InCallReg
*
Term.Id.
(#)

OK   NOK

FC = OK   FC = NOK

NO CLI   CLI

NO   YES   ESC

Term.Id.
(#)

NO   YES   ESC

Retry   NOK   OK

n   FRL
y

*
C
*
XXXX
(#)

ESC

NO   YES   ESC

Retry   NOK   OK

n   FRL
y

User release or
time-out and
network release

Other
procedure

= prompt to the user
( )   =   character not mandatory
FRL   = forced released after a number of unsuccessful attempts (local protection)
YES/NO = user acknowledgement
ESC   = escape code to return to procedure/feature identification
OK/NOK = system check

Figure A.3: Combined registration and limitation procedures

History

Document history			
January 1995	Draft for endorsement by	TCC 20	1995-05-29 to 1995-05-31
June 1995	Final draft for approval by	TA 22	1995-06-19 to 1995-06-20
September 1995	First Edition		
March 1996	Converted into Adobe Acrobat Portable Document Format (PDF)		
			|