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DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1

STAGE 3 DESCRIPTION FOR SUPPLEMENTARY SERVICES USING DSS 1

STAGE 3 DESCRIPTION FOR MULTIPARTY SUPPLEMENTARY SERVICES USING DSS 1

CLAUSE 1 – CONFERENCE CALLING
CLAUSE 2 – THREE-PARTY SERVICE

ITU-T Recommendation Q.954

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation Q.954, clauses 1 and 2, was prepared by the ITU-T Study Group XI (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation Q.954

STAGE 3 DESCRIPTION FOR MULTIPARTY SUPPLEMENTARY SERVICES USING DSS 1

(Helsinki, 1993)

1 Conference calling

1.1 Definition

This supplementary service provides a user with the ability to have a multi-connection call, i.e. a simultaneous communication between more than two parties.

1.2 Description

1.2.1 General description

When conference calling is invoked, conference resources (e.g. a "bridge") are allocated to the served user and any calls indicated by the service request are added to the conference. Once a conference is active, parties may be added, dropped, isolated (i.e. prevented from communicating with the conference), reattached or split (i.e. removed from the conference but remain connected to the conference controller). The controller can place his/her connection to the conference on hold, retrieve the conference, end the conference, or disconnect himself/herself from the conference.

1.2.2 Specific terminology

1.2.2.1 User

The DSS1 protocol entity at the user side of the user-network interface.

1.2.2.2 Network

The DSS1 protocol entity at the network side of the user-network interface.

1.2.2.3 Served user

The DSS1 protocol entity at the user side of the user-network interface used to request and control the CONF supplementary service.

1.2.2.4 Remote user

The DSS1 protocol entity at the user side of the user-network interface which is involved in a instance of the CONF supplementary service but which has no control of it.

1.2.2.5 Isolate

An action that restricts communications with a participant of the conference.

1.2.2.6 Reattach

An action that re-establishes the communication with a participant of the conference.

1.2.2.7 Split

An action that creates a normal call between the served user and a remote user.

1.2.2.8 Drop

An action that clears the connection to a remote user.

1.2.2.9 Floating

The situation in which an instance of the CONF supplementary service exists without the served user.

1.2.2.10 Conference ID

An identifier that identifies an instance of the CONF supplementary service.

1.2.2.11 Party ID

An identifier that identifies a participant within an instance of the CONF supplementary service.

1.2.2.12 Invoke component

See 8.2.5.1.1/Q.932 [1].

1.2.2.13 Return result component

See 8.2.5.1.1/Q.932 [1].

1.2.2.14 Return error component

See 8.2.5.1.1/Q.932 [1].

1.2.3 Qualification on the applicability to telecommunication services

This service is only applicable to telephony teleservices.

The applicability of the 7 kHz audio bearer capability is for further study.

1.2.4 State definitions

The call states associated with basic call control according to Recommendation Q.931 [2] shall apply. No other states are used to describe the CONF supplementary service.

1.3 Operational requirements

1.3.1 Provision and withdrawal

Not applicable.

1.3.2 Requirements on the originating network side

Not applicable.

1.3.3 Requirements on the destination network side

Not applicable.

1.4 Coding requirements

Table 1-1 shows the definition of the operations and errors required for the CONF supplementary service using ASN.1 as specified in Recommendation X.208 [4] and using the OPERATION and ERROR macro as defined in Figure 4/X.219 [5].

All components (invoke, return result, return error and reject) shall be included within a Facility information element. This Facility information element may be included in any appropriate message unless a more restricting specification is given.

Table 1-2 contains the additional codepoints for the CONF supplementary service which shall be employed in octet 3 of the Notification indicator information element (to be conveyed in the NOTIFY message).

Table 1-3 shows the definition of the extended notification required for the CONF supplementary service using ASN.1 as specified in Recommendation X.208 [4] and using the NOTIFICATION macro as specified in Recommendation Q.932 [1].

TABLE 1-1/Q.954

Definition of operations and errors

```
Conference-Add-On-Operations { ccitt recommendation q 954 conference-add-on-operations-
and-errors (1) }

DEFINITIONS ::=
BEGIN

EXPORTS          BeginCONF, AddCONF, SplitCONF, DropCONF, IsolateCONF,
                 ReattachCONF, PartyDISC, FloatCONF, EndCONF, IllConferenceId,
                 IllPartyId, NumberOfPartiesExceeded, NotActive, NotAllowed, PartyId,
                 ConferenceId, ConfSize;

IMPORTS          OPERATION,
                 ERROR
                 FROM   Remote-Operation-Notation
                        { joint-iso-ccitt remote-operations(4) notation(0) }

                 userNotSubscribed, notAvailable,
                 resourceUnavailable,
                 invalidCallState,
                 supplementaryServiceInteractionNotAllowed
                 FROM   General-Error-List
                        { ccitt recommendation q 950 general-error-list (1) };

BeginCONF::=     OPERATION
                 ARGUMENT                ConfSize -- optional
                 RESULT                  SEQUENCE {
                                                ConferenceId,
                                                PartyId OPTIONAL }
                 ERRORS                  { userNotSubscribed, notAvailable,
                                         resourceUnavailable, invalidCallState }

AddCONF ::=      OPERATION
                 ARGUMENT                ConferenceId
                 RESULT                  PartyId
                 ERRORS                  { IllConferenceId,
                                         NumberOfPartiesExceeded,
                                         NotAllowed,
                                         supplementaryServiceInteractionNotAllowed,
                                         invalidCallState }

SplitCONF ::=    OPERATION
                 ARGUMENT                SEQUENCE {
                                                ConferenceId,
                                                PartyId }

                 RESULT
                 ERRORS                  { IllConferenceId,
                                         IllPartyId }

DropCONF ::=     OPERATION
                 ARGUMENT                PartyId
                 RESULT
                 ERRORS                  { IllPartyId, NotActive }

IsolateCONF ::=  OPERATION
                 ARGUMENT                PartyId
                 RESULT
                 ERRORS                  { IllPartyId, NotActive }

ReattachCONF ::= OPERATION
                 ARGUMENT                PartyId
                 RESULT
                 ERRORS                  { IllPartyId, NotActive }
```

TABLE 1-1/Q.954 *(continued)*

Definition of operations and errors

```
PartyDISC ::=                   OPERATION
                                ARGUMENT        PartyId
                                RESULT
                                ERRORS          { IllPartyId, NotActive }

FloatCONF ::=                   OPERATION
                                ERRORS          { NotActive, NotAllowed }

EndCONF ::=                     OPERATION
                                ERRORS          { NotActive }

IdentifyConferee ::=            OPERATION
                                ARGUMENT        PartyId

IllConferenceId ::=             ERROR

IllPartyId ::=                  ERROR

NumberOfPartiesExceeded ::= ERROR

NotActive ::=                   ERROR

NotAllowed ::=                  ERROR

PartyId ::=                     ::= INTEGER (0..127)

ConferenceId                    ::= INTEGER (0..127)

ConfSize                        ::= INTEGER (0..127)

beginCONF BeginCONF ::= 40

addCONF AddCONF ::= 41

splitCONF SplitCONF ::= 42

dropCONF DropCONF ::= 43

isolateCONF IsolateCONF ::= 44

reattachCONF ReattachCONF ::= 45

partyDISC PartyDISC ::= 46

floatCONF FloatCONF ::= 47

endCONF EndCONF ::= 48

identifyConferee IdentifyConferee ::= 49

illConferenceId IllConferenceId ::= 28

illPartyId IllPartyId ::= 29

numberOfParties Exceeded NumberOfParties Exceeded ::= 30

notActive NotActive ::= 31

notAllowed NotAllowed ::= 32

END -- of Conference-Add-On-Operations
```

TABLE 1-2/Q.954

Additional codepoints in the Notification indicator information element

Bits 8 7 6 5 4 3 2 1	Meaning
1 1 0 0 0 0 1 0	Conference established, i.e. the user takes part in a multiparty call
1 1 0 0 0 0 1 1	Conference disconnected, i.e. the user takes part in a, normal, two party call
1 1 0 0 0 1 0 0	Other party added
1 1 0 0 0 1 0 1	Isolated
1 1 0 0 0 1 1 0	Reattached
1 1 0 0 0 1 1 1	Other party isolated
1 1 0 0 1 0 0 0	Other party reattached
1 1 0 0 1 0 0 1	Other party split
1 1 0 0 1 0 1 0	Other party disconnected
1 1 0 0 1 0 1 1	Conference floating

TABLE 1-3/Q.954

Definition of extended notification

```
Conference-Add-on-Notifications { ccitt recommendation q 954 conference-add-on (1)
extended-notifications (2) }

DEFINITIONS                    ::=
BEGIN

EXPORTS                        PartyIdNotification;

IMPORTS                        NOTIFICATION
                               FROM
                               { ccitt recommendation q 932 notification-data-structure (5) }
                               PartyId
                               FROM Conference-Add-On-Operations
                               { ccitt recommendation q 954 conference-add-on (1) operations-and-types (1)
};

PartyIdNotification ::=        NOTIFICATION
                               ARGUMENT PartyId

partyIdNotification, PartyIdNotification ::= 1

END -- of Conference-Add-On-Notifications
```

1.5 Signalling requirements

Where the text in the following sections refers to an "xxxx" invoke component, an invoke component is meant with its operation value set to the value of operation "xxxx".

1.5.1 Activation, deactivation and registration

Not applicable, i.e. no signalling procedures are required for the activation, deactivation or registration of this supplementary service.

1.5.2 Invocation and operation

1.5.2.1 Beginning the conference from the idle state

1.5.2.1.1 Normal operation

To request a conference (i.e. without an initial conferee), the served user shall send a SETUP message to the network including a Facility information element and a Bearer capability information element. The Facility information element shall contain a BeginCONF-Invoke component. This component may contain a ConfSize parameter indicating the maximum number of conferees. If this parameter is not provided, then the network shall set the conference size to a network dependent value. The Bearer capability information element shall indicate an appropriate bearer capability with regard to the applicability of the conference call add-on service. The Called party number and the Called party subaddress information element shall be omitted by the user. Further the normal basic call procedures apply according to 5.1/Q.931 [2].

When the network responds with a CONNECT message it shall include a BeginCONF-Return-Result component in a Facility information element. This component contains a ConferenceId parameter. The ConferenceId shall be used in some operations to identify the conference explicitly.

When the user receives a correctly encoded BeginCONF-Return-Result component the user shall accept the provided information, save the included ConferenceId and shall not respond to the network.

The procedures used to request a conference are completely independent from other calls.

1.5.2.1.2 Exceptional procedures

If the user is not subscribed to the CONF supplementary service, the network shall start the basic call clearing procedures as defined in 5.3/Q.931 [2]. One of the messages sent by the network to the served user shall contain a Facility information element with a BeginCONF-Return-Error component indicating the error "notSubscribed". Furthermore this message shall contain a Cause information element indicating cause No. 31 "Normal, unspecified" and a location of "public network serving the local user".

If the user is not subscribed to the basic service as requested in the SETUP message, the network shall start the basic call clearing procedures as defined in 5.3/Q.931 [2].

If the user indicates an inappropriate bearer capability, the network shall start the basic call clearing procedures as defined in 5.3/Q.931 [2]. One of the messages sent by the network to the served user shall contain a Facility information element with a BeginCONF-Return-Error component indicating the error "notAvailable". Furthermore this message shall contain a Cause information element indicating cause No. 31 "Normal, unspecified" and a location of "public network serving the local user".

If the network cannot accept the operation because the conference size as requested by the user exceeds the size supported by the network, the network shall start the basic call clearing procedures as defined in 5.3/Q.931 [2]. One of the messages sent by the network to the served user shall contain a Facility information element with a BeginCONF-Return-Error component indicating the error "NumberOfPartiesExceeded". Furthermore this message shall contain a Cause information element indicating cause No. 31 "Normal, unspecified" and a location of "public network serving the local user".

If the network receives a BeginCONF-Invoke component whilst not in the Active call state (N10) and not in the Null call state (N0), the network shall send a BeginCONF-Return-Result component to the served user in a FACILITY message indicating the error "invalidCallState".

1.5.2.2 Beginning the conference from an active call

1.5.2.2.1 Normal operation

To request a conference the served user shall send a FACILITY message to the network indicating the call reference of the existing call and including a Facility information element. This Facility information element shall contain a BeginCONF-Invoke component. This component may contain a ConfSize parameter indicating the maximum number of conferees. If this parameter is not provided, then the network shall set the conference size to a network dependent value.

The network shall send a BeginCONF-Return-Result component to the served user in a FACILITY message. This component contains a ConferenceId and PartyId parameter. The ConferenceId shall be used in some operations to identify the conference explicitly. The PartyId shall be used in subsequent operations to identify the remote user of the original call.

When the user receives a correctly encoded BeginCONF-Return-Result component the user shall accept the provided information, save the included ConferenceId and PartyId parameter and shall not respond to the network.

The procedures to generate PartyId's are outside the scope of this Recommendation. The requirements with respect to PartyId's are that a PartyId used to identify a party shall not be used again until the party identified by this PartyId has been dropped from the conference, i.e. a PartyId shall be unique within the context of a single conference.

The network shall send a NOTIFY message to the remote user with a Notification indicator information element indicating that this party has been added to the conference ("Conference established").

1.5.2.2.2 Exceptional procedure

If the user is not subscribed to the CONF supplementary service, the network shall send a BeginCONF-Return-Error component to the served user in a FACILITY message. A parameter shall indicate "notSubscribed".

If the network cannot accept the operation because the conference size as requested by the user exceeds the size supported by the network, the network shall send a BeginCONF-Return-Error component indicating the error "NumberOfPartiesExceeded" to the served user in a FACILITY message.

If the user indicates an inappropriate bearer capability, the network send a BeginCONF-Return-Error component indicating "notAvailable" to the served user in a FACILITY message.

1.5.2.3 Adding a party

1.5.2.3.1 Normal operation

To add a new party the connection to the conference bridge can be either in the (Active,Idle) state or in the (Active, Held) state and the connection to the party to be added shall be either in the (Active, Idle) state or (Active, Held) state.

The served user shall send a FACILITY message to the network indicating the call reference of the call to be added and including an AddCONF-Invoke component. This component contains a ConferenceId parameter indicating the conference.

The network shall send a DISCONNECT message to the served user containing a Facility information element with a AddCONF-Return-Result component and continue clearing according to 5.3.3/Q.931 [2]. This component contains a PartyId. This PartyId shall be used in subsequent operations to identify the added party. The first clearing message shall contain a Cause information element indicating cause No. 16 "Normal call clearing" and a location of "public network serving the local user".

When the user receives a correctly encoded AddCONF-Return-Result component the user shall accept the provided information, save the included PartyId.

The procedures to generate PartyId's are outside the scope of this Recommendation. The requirements with respect to PartyId's are that a PartyId used to identify a party shall not be used again until the party identified by this PartyId has been dropped from the conference, i.e. a PartyId shall be unique within the context of a single conference.

The network shall send a NOTIFY message to the added remote user with a Notification indicator information element indicating that this party has been added to the conference ("Conference established").

The network shall send a NOTIFY message to all other remote users with a Notification indicator information element indicating that a new party has been added to the conference ("Other party added").

1.5.2.3.2 Exceptional procedures

If the ConferenceId used is not associated with a conference known to the network, the network shall send an AddCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate "illConferenceId".

NOTE – This error could also occur as a result of routing constraints.

If the network cannot accept this party because the maximum number of parties has been reached, the network shall send an AddCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate "NumberOfPartiesExceeded".

If the network cannot accept this operation because addition of the call would result in violation of Closed User Group rules, the network shall send an AddCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate "supplementaryServiceInteractionNotAllowed".

If the network receives an AddCONF invoke component for a call reference value that is not in the Active call state, the network shall send an AddCONF error component indicating the error "invalidCallState" to the served user in a FACILITY message.

If the network cannot accept this operation for any other reason, the network shall send an AddCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate "notAllowed".

1.5.2.4 Isolate a party

1.5.2.4.1 Normal operation

To isolate a party the served user shall send an IsolateCONF-Invoke component to the network in a FACILITY message. The component includes a PartyId parameter identifying the party to be isolated.

To indicate a successful operation the network shall send an IsolateCONF-Return-Result component to the served user in a FACILITY message.

When the user receives a correctly encoded IsolateCONF-Return-Result component the user shall accept the provided information and shall not respond to the network.

Now the isolated party is still connected to the conference but communication is impossible.

The network shall send a NOTIFY message to the isolated remote user with a Notification indicator information element indicating "Isolated".

The network shall send a NOTIFY message to all other remote users with a Notification indicator information element indicating that a party has been isolated ("Other party isolated").

1.5.2.4.2 Exceptional procedures

If the PartyId used is not associated with a party the network shall send an IsolateCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate "illPartyId".

If the network cannot accept this operation because the conference has not successfully been established, the network shall send an IsolateCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate “notActive”.

If the party indicated in the IsolateCONF-Invoke component is already isolated then the network shall not treat this as an error but shall return a Isolate-Return-Result component to the served user in a FACILITY message.

1.5.2.5 Reattach a party

1.5.2.5.1 Normal operation

To reattach a (isolated) party the served user shall send a ReattachCONF-Invoke component to the network in a FACILITY message. The component includes a PartyId parameter identifying the party to be reattached.

To indicate a successful operation the network shall send a ReattachCONF-Return-Result component to the served user in a FACILITY message.

When the user receives a correctly encoded ReattachCONF-Return-Result component the user shall accept the provided information and shall not respond to the network.

The network shall send a NOTIFY message to the reattached conferee with a Notification indicator information element indicating “Reattached”.

The network shall send a NOTIFY message to all other parties with a Notification indicator information element indicating that a party has been reattached (“Other party reattached”).

1.5.2.5.2 Exceptional procedures

If the PartyId used is not associated with a party the network shall send an ReattachCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate “illPartyId”.

If the network cannot accept this operation because the conference has not successfully been established, the network shall send an ReattachCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate “notActive”.

If the party indicated in the ReattachCONF-Invoke component is already reattached then the network shall not treat this as an error but return a Reattach-Return-Result component to the served user in a FACILITY message.

1.5.2.6 Splitting a party

1.5.2.6.1 Normal operation

To split a party, that may be isolated, the served user shall send a SETUP message to the network including a Facility information element and a Bearer capability information element. The Facility information element shall contain a SplitCONF-Invoke component. This component contains a ConferenceId parameter identifying the conference and a PartyId parameter identifying the party to be split. The Bearer capability information element shall indicate an appropriate bearer capability with regard to the applicability of the -CONF supplementary service. The Called party number and Called party subaddress information element shall be omitted by the user. Further the normal basic call procedure apply according to 5.1/Q.931 [2].

To indicate a successful operation the network shall send a SplitCONF-Return-Result component to the served user in the CONNECT message and release the related PartyId; the PartyId may be used to identify future conferees.

When the user receives a correctly encoded SplitCONF-Return-Result component the user shall accept the provided information, release the PartyId included in the SplitCONF-Invoke component and shall not respond to the network.

Now the served user has a separate call with the indicated party. All other conferees are still involved in the conference.

The network shall send a NOTIFY message to the split remote user with a Notification indicator information element indicating “Conference disconnected”.

The network shall send a NOTIFY message to all other remote users with a Notification indicator information element indicating that a party has been split (“Other party split”).

1.5.2.6.2 Exceptional procedures

If the ConferenceId used is not associated with a conference the network shall start the basic call clearing procedures according to 5.3/Q.931 [2]. One of the messages sent to the served user shall contain a SplitCONF-Return-Error component. A parameter included in this component shall indicate “illConferenceId”. Furthermore this message shall contain a Cause information element indicating cause No. 29 “Facility rejected” and a location of “public network serving the local user”.

If the PartyId used is not associated with a party the network shall start the basic call clearing procedures according to 5.3/Q.931 [2]. One of the messages sent to the served user shall contain a SplitCONF-Return-Error component. A parameter included in this component shall indicate “illPartyId”. Furthermore this message shall contain a Cause information element indicating cause No. 29 “Facility rejected” and a location of “public network serving the local user”.

1.5.2.7 Disconnect a party

1.5.2.7.1 Normal operation

To disconnect a party the served user shall send a DropCONF-Invoke component to the network in a FACILITY message. The component includes a PartyId parameter identifying the party to be disconnected.

To indicate that the party identified has been removed from the conference and that the clearing procedures according to 5.3.4/Q.931 [2] are in progress at the remote user, the network shall send a DropCONF-Return-Result component to the served user in a FACILITY message.

When the user receives a correctly encoded DropCONF-Return-Result component the user shall accept the provided information and shall not respond to the network.

The PartyId shall be released by the user and the network and may be used to identify future conferees.

The network shall send a NOTIFY message to all other remote users with a Notification indicator information element indicating that a party has been disconnected (“Other party disconnect”).

At any time a conferee can disconnect from the conference by using the call clearing procedures according to 5.3.3/Q.931 [2]. To indicate the served user that such a conferee has been removed from the conference the network shall send a PartyDISC-Invoke component in a FACILITY message to the served user with a parameter indicating the PartyId associated with this conferee, after the conferee is disconnected from the conference bridge.

On sending the PartyDISC-Invoke component, the network shall release the PartyId; the PartyId may be used to identify future conferees. On receiving the PartyDISC-Invoke component, the user shall release the PartyId.

The network shall send a NOTIFY message to all other remote users with a Notification indicator information element indicating that a party has been disconnected (“Other party disconnect”).

1.5.2.7.2 Exceptional procedures

If the PartyId used is not associated with a party the network shall send a DropCONF-Return-Error component to the served user in a FACILITY message. A parameter included in this component shall indicate “illPartyId”.

If the network cannot accept this operation because the conference has not successfully been established, the network shall send a DropCONF-Return-Error component to the served user. A parameter included in this component shall indicate “notActive”.

1.5.2.8 Terminate the conference

1.5.2.8.1 Normal operation

To terminate the conference the served user shall clear the connection to the conference bridge by sending a FACILITY to the network containing a Facility information element with an endCONF-Invoke component.

The network shall send a DISCONNECT message to the served user containing a Facility information element with an endCONF-Return-Result component and continue clearing according to 5.3.3/Q.931 [2]. The first clearing message send to the served user shall contain a Cause information element indicating cause No. 16 “Normal call clearing” and a location of “public network serving the local user”.

On sending the DISCONNECT message, the network shall make the conference unavailable, i.e. all subsequent operations invoked for this conference by the user shall be responded to with the appropriate return error component specifying “notActive”. On completion of call clearing (e.g. sending or receiving the RELEASE COMPLETE message associated with clearing the connection), the network shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference. The ConferenceId shall be available for reuse on other conferences.

On clearing completion (e.g. sending or receiving the RELEASE COMPLETE message associated with clearing the connection), the user shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference.

On a successful clearing of the call to the conference the network shall start to clear the calls to the remote users by means of basic call clearing procedures according to 5.3.4/Q.931 [2].

1.5.2.8.2 Exceptional procedures

If the network cannot accept this operation because the conference has not successfully been established, the network shall send an endCONF-Return-Error component to the served user. A parameter included in this component shall indicate “notActive”.

If the connection between the served user and the conference bridge is being cleared for some reason, then the conference shall be terminated.

1.5.2.9 Disconnect the served user

1.5.2.9.1 Normal operation

To disconnect its connection the served user shall send a FloatCONF-Invoke component to the network in a FACILITY message. To indicate that this request is accepted, i.e. the floating conditions are met, the network shall send a FloatCONF-Return-Result component in a DISCONNECT message. Call clearing shall proceed according to Recommendation Q.931 [2]. The first clearing message send to the served user shall contain a Cause information element indicating cause No. 16 “Normal call clearing” and a location of “public network serving the local user”.

On clearing completion (e.g. sending or receiving the RELEASE COMPLETE message associated with clearing the connection), the user shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference.

The network shall send a NOTIFY message to all remote users with a Notification indicator information element indicating that the conference is in a floating situation (“Conference floating”).

When the CONF supplementary service terminates, the network shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference. The ConferenceId shall be available for reuse on other conferences.

1.5.2.9.2 Exceptional procedures

If the network cannot accept this operation because the floating conditions are not met, the network shall send an EndCONF-Return-Error component in a FACILITY message to the served user. A parameter included in this component shall indicate “notallowed”.

If the network cannot accept this operation because the conference has not successfully been established, the network shall send an EndCONF-Return-Error component in a FACILITY message to the served user. A parameter included in this component shall indicate “notActive”.

1.5.2.10 Call clearing by served user

1.5.2.10.1 Normal operation

To clear its connection to the network the served user shall proceed according to 5.3.3/Q.931 [2].

On receiving the DISCONNECT message, the network shall make the conference unavailable to the served user, i.e. all subsequent operations invoked for this conference by the user shall be responded to with the appropriate return error component specifying “notActive”.

If the conditions for floating are met, then the network shall continue call clearing to the served user but the CONF supplementary service will continue until one remote user is left.

The network shall send a NOTIFY message to all remote users with a Notification indicator information element indicating that the conference is in a floating situation (“Conference floating”).

On clearing completion (e.g. sending or receiving the RELEASE COMPLETE message associated with clearing the connection), the user shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference.

When the CONF supplementary service terminates, the network shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference. The ConferenceId shall be available for reuse on other conferences.

1.5.2.10.2 Exceptional procedures

If the conditions for floating are not met, then the network shall continue call clearing to the served user and start to clear the calls to the remote user by means of basic call clearing procedures according to 5.3.4/Q.931 [2].

On clearing completion (e.g. sending or receiving the RELEASE COMPLETE message associated with clearing the connection), the user shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference.

On clearing completion (e.g. sending or receiving the RELEASE COMPLETE message), the network shall release the PartyId associated with each remote user, and shall release the ConferenceId associated with the conference. The ConferenceId shall be available for reuse on other conferences.

1.6 Interactions with other supplementary services

If a remote party uses during the conference a supplementary service or other function that generates a notification to the remote user (i.e. the served user of the CONF supplementary service), this notification shall be sent to the served user as normal with the following addition.

The Notification indicator information element sent to the served user shall be preceded by another Notification indicator information element in the same message. This Notification indicator information element shall be the PartyNotification extended notification, as defined in Table 1-3 and using the extended notification mechanism as defined in 8.2.9/Q.932 [1], indicating the PartyID of the party pertaining to the notification.

1.6.1 Call Waiting

No impact.

1.6.2 Call Transfer

No impact.

NOTE – If user A transfers his call to another user, only the call is transferred, not the capability to control the conference.

1.6.3 Connected Line Identification Presentation

No impact.

1.6.4 Connected Line Identification Restriction

No impact.

1.6.5 Calling Line Identification Presentation

No impact.

1.6.6 Calling Line Identification Restriction

No impact.

1.6.7 Closed User Group

All calls added to the conference shall be made within the scope of a single closed user group. If the served user requests to add a call, made within the scope of a different closed user group, using the outgoing access facility or without using the closed user group supplementary service, to the conference, then the network shall regard this as an error and apply the procedure as specified in 1.5.2.3.2.

1.6.8 Conference

1.6.8.1 Conference Call Add-on

A conference call, as established by the served user, cannot be used to request the CONF supplementary service (see 1.5.2.2) and cannot be added to an existing conference (see 1.5.2.3). The appropriate error handling is specified in 1.5.2.2.2 and 1.5.2.3.2.

1.6.8.2 Meet-me Conference

A meet-me conference call, as established by the served user, cannot be used to request the CONF supplementary service (see 1.5.2.2) and cannot be added to an existing conference (see 1.5.2.3). The appropriate error handling is specified in 1.5.2.2.2 and 1.5.2.3.2.

1.6.9 Direct-dialling-in

No impact.

1.6.10 Call diversion (call forwarding) services

1.6.10.1 Call Forwarding Busy

No impact.

1.6.10.2 Call Forwarding No Reply

No impact.

1.6.10.3 Call Forwarding Unconditional

No impact.

1.6.10.4 Call Deflection

No impact.

1.6.11 User-to-User Signalling

1.6.11.1 Service 1

On calls which are established to potential conferees outside the conference, service 1 is available during call set-up according to normal service 1 procedures.

When the call becomes part of a conference, service 1 is no more available. No specific notification shall be sent to the conferee in this case.

1.6.11.2 Service 2

No impact.

1.6.11.3 Service 3

The served user and each individual remote user can exchange USER INFORMATION messages by use of service 3. Furthermore, the served user can send USER INFORMATION messages as broadcast to all remote users.

1.6.11.3.1 Service 3 activation

Before exchange of USER INFORMATION messages service 3 shall be activated for the initial call to each individual user which at a later time will become a conferee by being add to the conference, i.e. the activation procedure shall be performed outside the conference call. Consequently, service 3 cannot be activated to a user already acting as a conferee.

The activation of service 3 between the served and a user which at a later time will become a remote user shall be performed according to the procedures in 1.5.2.3/Q.957 [8].

When a remote user is added to the conference the network shall retain knowledge of whether service 3 is active to this remote user and whether service 3 was activated by the served user or the remote user.

When a private communication is created with a party to which service 3 was activated, the service 3 shall remain available in association with the private communication.

When a private communication is created with a remote user for which service 3 was not available during the conference, service 3 can be activated in association with the private communication by use of the procedure described in 1.5.2.3.2/Q.957.

1.6.11.3.2 Transfer of USER INFORMATION messages

When USER INFORMATION messages are to be exchanged between the served user and an individual remote user, the procedures described in 1.5.2.3.4/Q.957 [8] shall apply with following exceptions for the served user's user-network interface:

- The served user shall include a Facility information element with a identifyConferee invoke component in the USER INFORMATION message sent to the network. The component shall include the PartyId parameter to identify the remote user. The network shall not include this Facility information element in the USER INFORMATION message sent to the remote user.

- When the network receives a USER INFORMATION message from a remote user, this USER INFORMATION message shall be sent to the served user including a Facility information element with a IdentifyConferee invoke component and the PartyId parameter identifying the remote user.

If the remote user sends a USER INFORMATION message to the network without the above mentioned Facility information element, the network shall treat this as a request for the broadcast capability and shall send a USER INFORMATION message to each individual remote user.

For sending of USER INFORMATION messages from the served user, the flow control procedures specified in 1.5.2.3.5/Q.957 shall apply for the served user’s connection to the conference. Consequently, the served user can send up to the maximum limit of USER INFORMATION messages to the remote users in common, including broadcast sending.

Since more than one remote user can send USER INFORMATION messages to the served user at the same time, the normal maximum limit may be exceeded at the served user's network. In this case the network shall deliver the received USER INFORMATION messages to the served user without any restrictions.

Normal flow control procedures shall be followed at the remote user’s network.

1.6.12 Line Hunting

No impact.

1.6.13 Three-Party Service

A call involved in a 3-way conversation, as established by the served user, cannot be used to request the CONF supplementary service (see 1.5.2.2) and cannot be added to an existing conference (see 1.5.2.3). The appropriate error handling is specified in 1.5.2.2.2 and 1.5.2.3.2.

1.6.14 Multiple Subscriber Number

No impact.

1.6.15 Call Hold

If the conference call is held or retrieved no NOTIFY message shall be sent to the remote users.

1.6.16 Advice of Charge

No impact.

1.6.17 Sub-addressing

No impact.

1.6.18 Terminal Portability

A conference call as established by the served user cannot be suspended. If the served user requests to suspend a conference call the network shall reject this request by sending a SUSPEND REJECT message to the served user as specified in 4/Q.953 [9].

1.6.19 Completion of Calls to Busy Subscriber

No impact.

1.6.20 Malicious Call Identification

No impact.

1.6.21 Reverse Charging

The procedures as described in 3.5.2.2/Q.956 shall apply with the following addition.

When the network sends a requestREV invoke component to the served user in a FACILITY message, the network shall send in the same FACILITY message in a IdentifyConferee component. The PartyId parameter in this component shall identify the remote user requesting the Reverse Charging supplementary service.

1.6.22 Multi-Level Precedence and Preemption

See 3.6.8/Q.955 [10].

1.7 Interactions with other networks

1.7.1 Interactions with non-ISDNs

Conferees in a PSTN may have a decreased notification level.

1.7.2 Procedures for interworking with private ISDNs

If the served user, residing in a private network, requests the CONF supplementary service, as provided by the public network, the procedures of 1.5.2 shall apply.

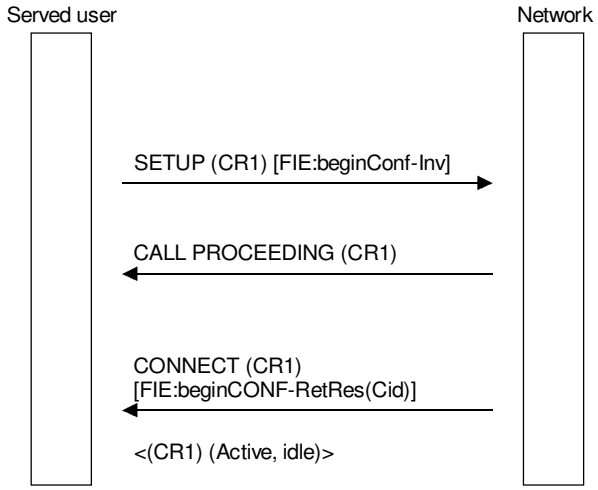
Where the service provider resides in a private network and conferees in the public network, the private network shall send the notification codepoints as defined in this Recommendation to the public network in NOTIFY messages when appropriate.

1.8 Signalling flows

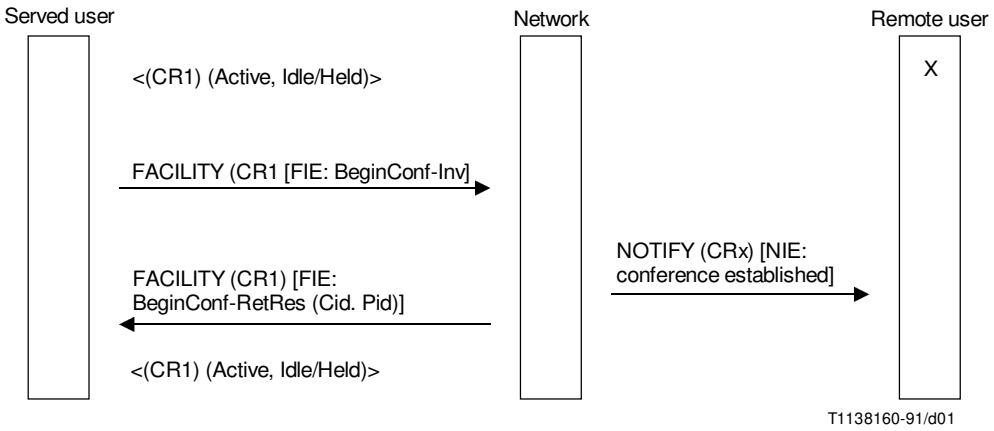
The message flows for the CONF supplementary service are shown as follows:

- Figure 1-1a) (Starting the conference from the idle state);
- Figure 1-1b) (Beginning a conference from an active call);
- Figure 1-2 (Adding an existing call to the conference);
- Figure 1-3 (Adding a new call to the conference);
- Figure 1-4 (Adding an incoming call to the conference);
- Figure 1-5 (Isolate a party);
- Figure 1-6 (Reattach a party);
- Figure 1-7 (Split a party);
- Figure 1-8 (Disconnect party by served user);
- Figure 1-9 (Disconnect by party);
- Figure 1-10 (Terminate the conference);
- Figure 1-11 (Disconnect by served user when floating is allowed);
- Figure 1-12 (Disconnect by served user when floating is not allowed);
- Figure 1-13 (Explicit request to disconnect the served user from the conference);

NOTE – Figures 1-1 to 1-13 use the identifiers X and N to identify remote users. If, by example, a conference has remote user 1, 2, 3, 4, and 5 and remote user 3 is disconnected, then X represents remote user 3 and N represents remote users 1, 2, 4 and 5.



a) Starting the conference from the idle state



b) Beginning a conference from an active call

FIGURE 1-1/Q.954

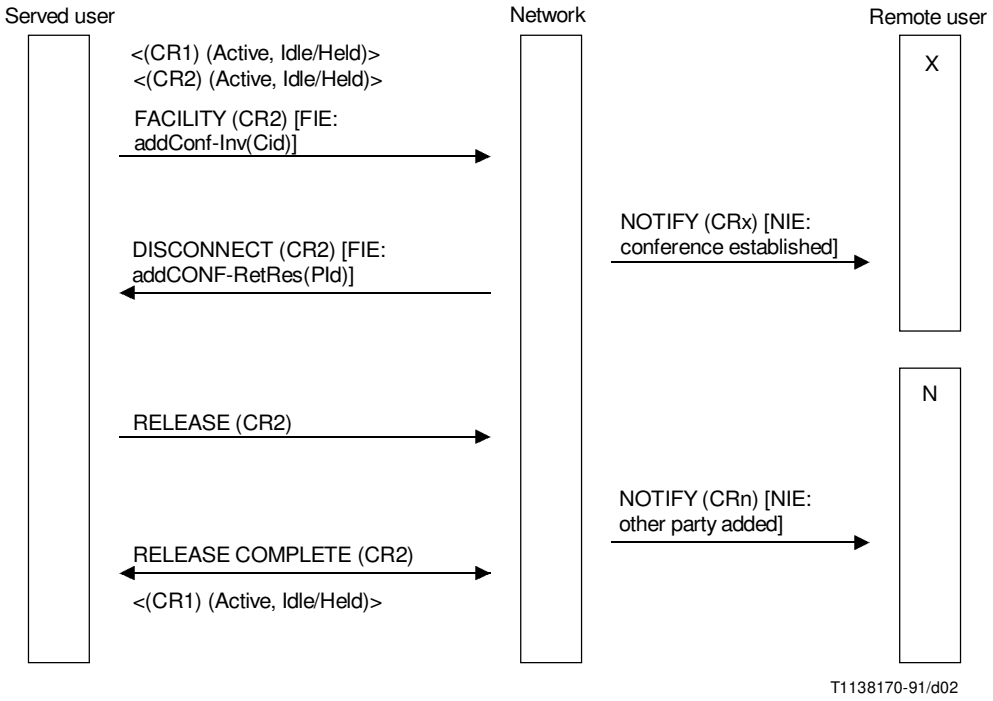
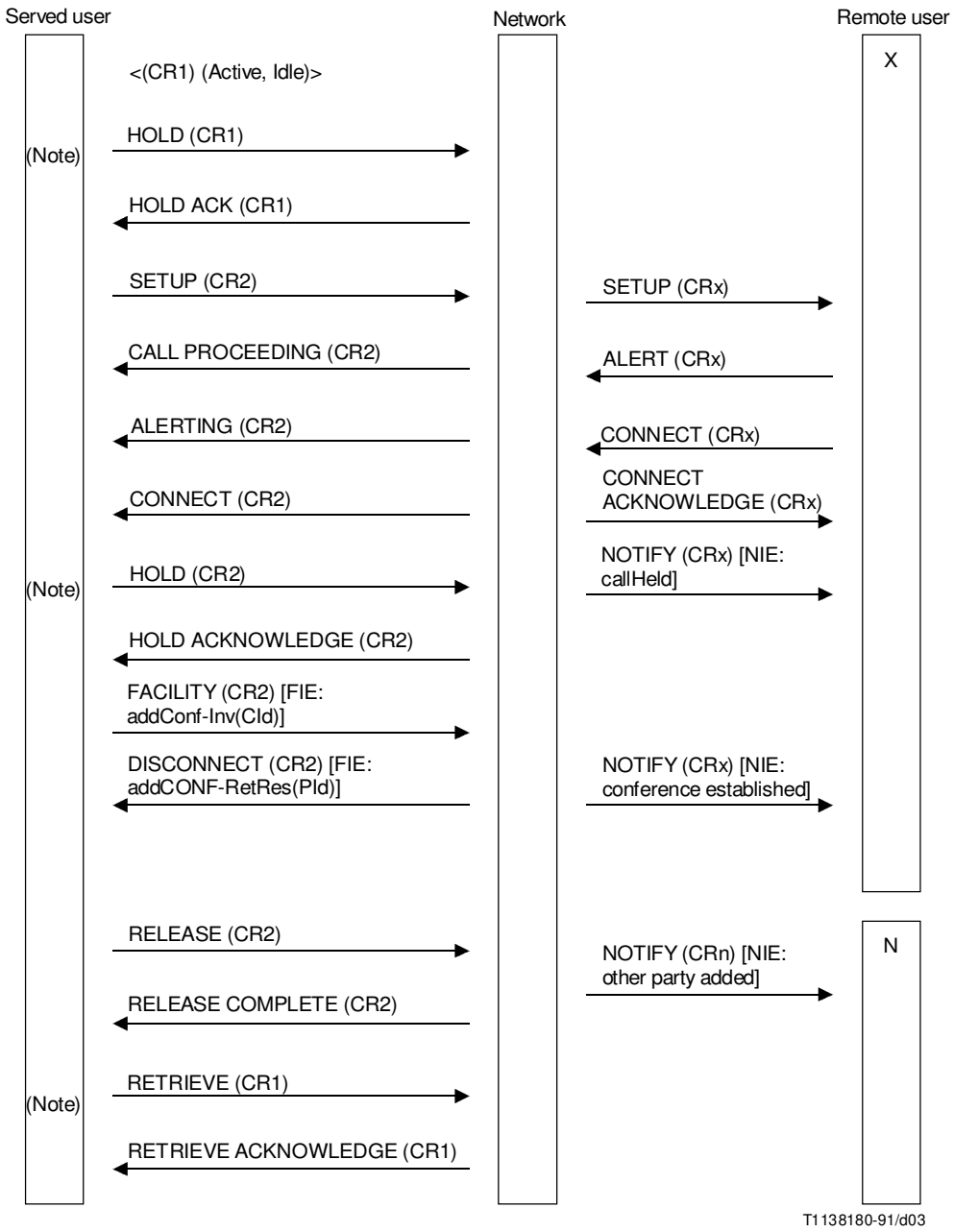


FIGURE 1-2/Q.954

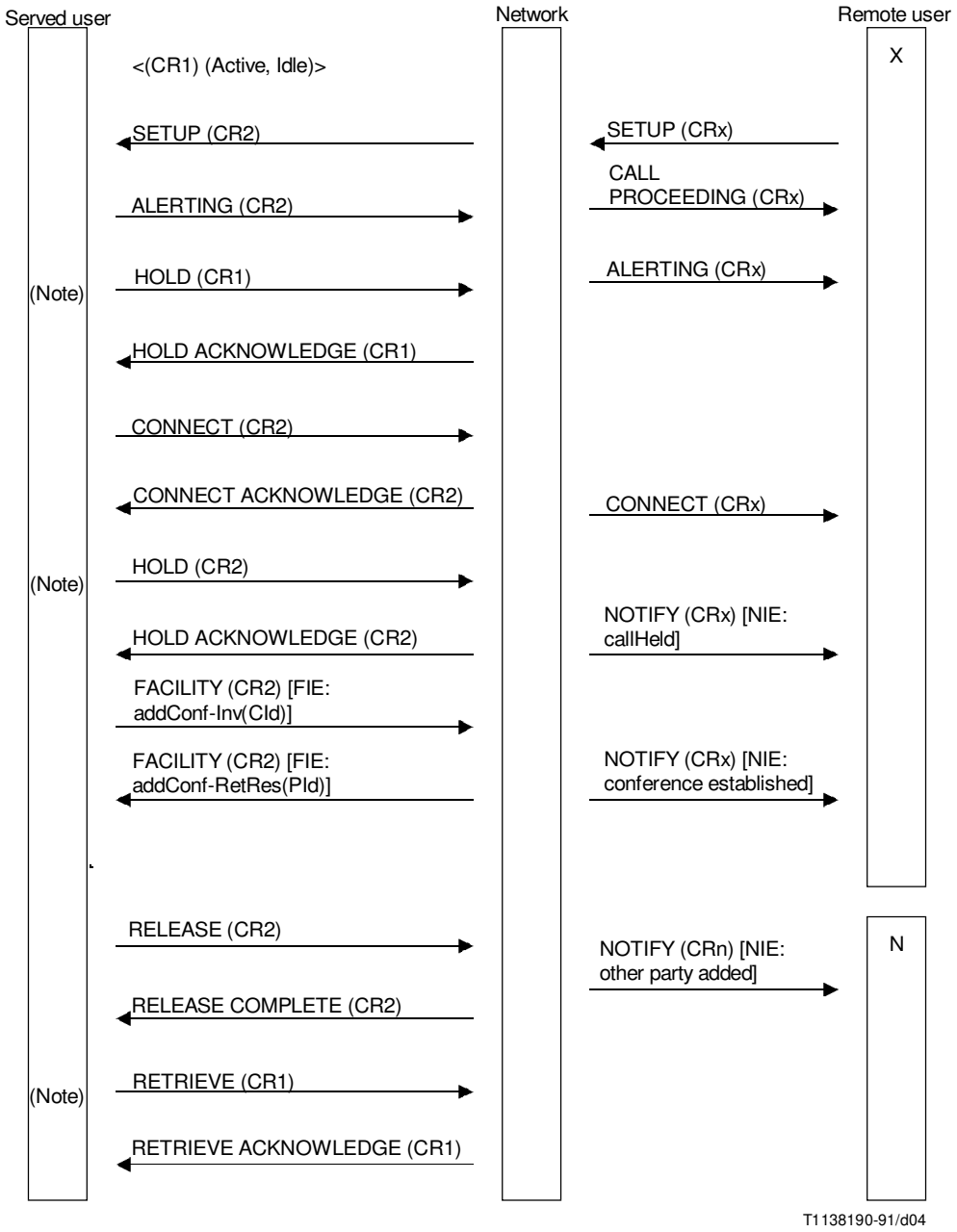
Adding an existing call to the conference



NOTE – This uses the Call Hold service and is not an essential part of the CONF supplementary service.

FIGURE 1-3/Q.954

Adding a new call to the conference



NOTE – This uses the Call Hold supplementary service and is not an essential part of the CONF supplementary service.

FIGURE 1-4/Q.954

Adding an incoming call to the conference

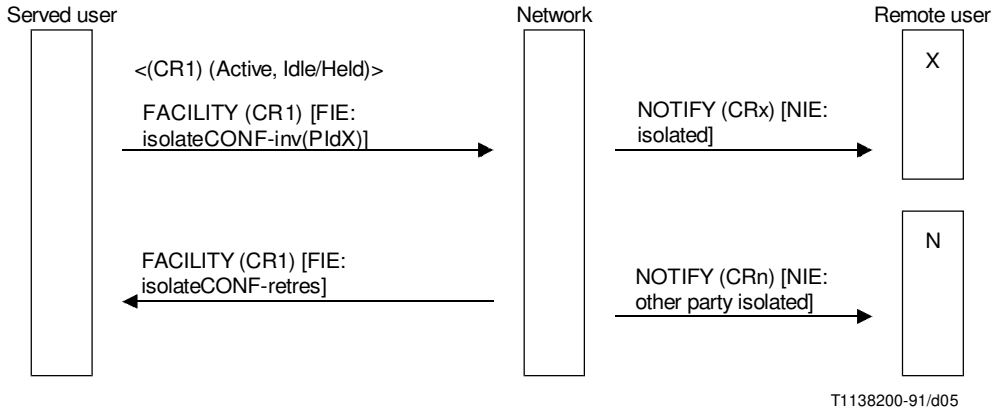


FIGURE 1-5/Q.954

Isolate a party

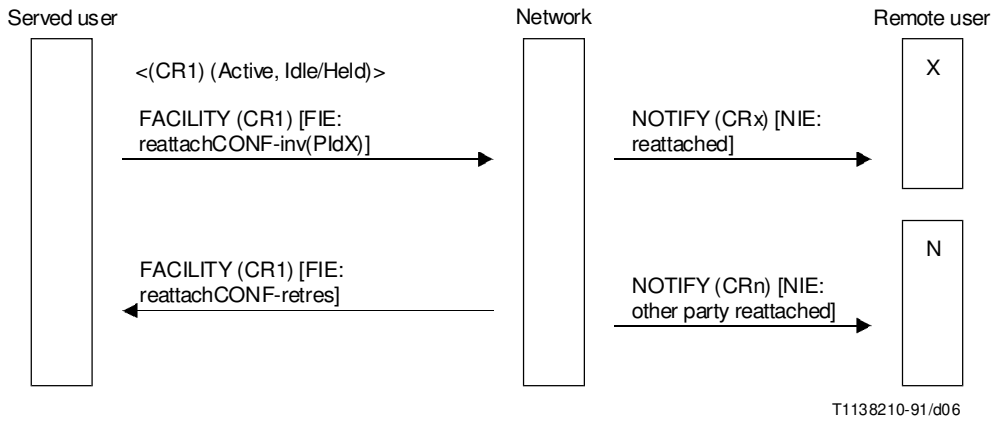


FIGURE 1-6/Q.954

Reattach a party

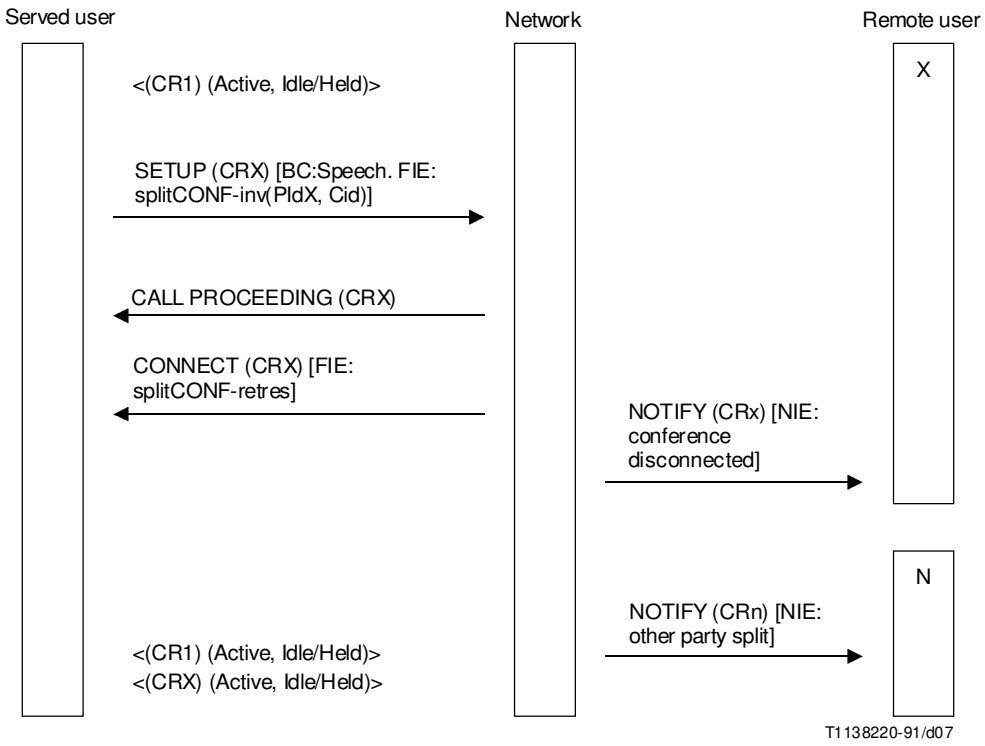


FIGURE 1-7/Q.954

Split a party

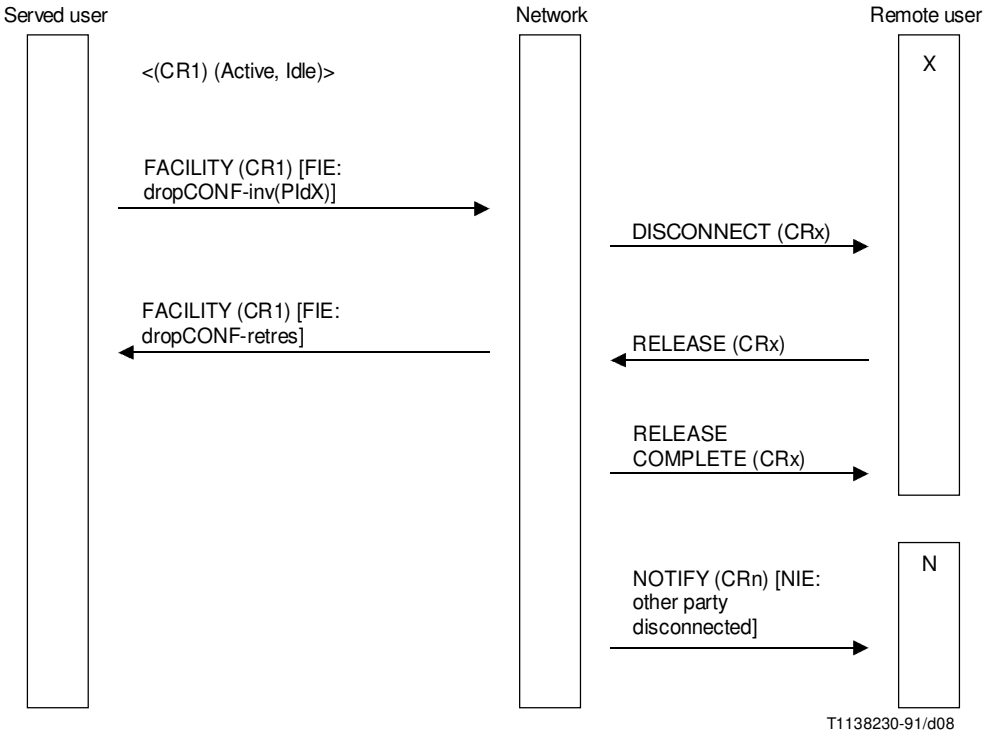


FIGURE 1-8/Q.954

Disconnect party by served user

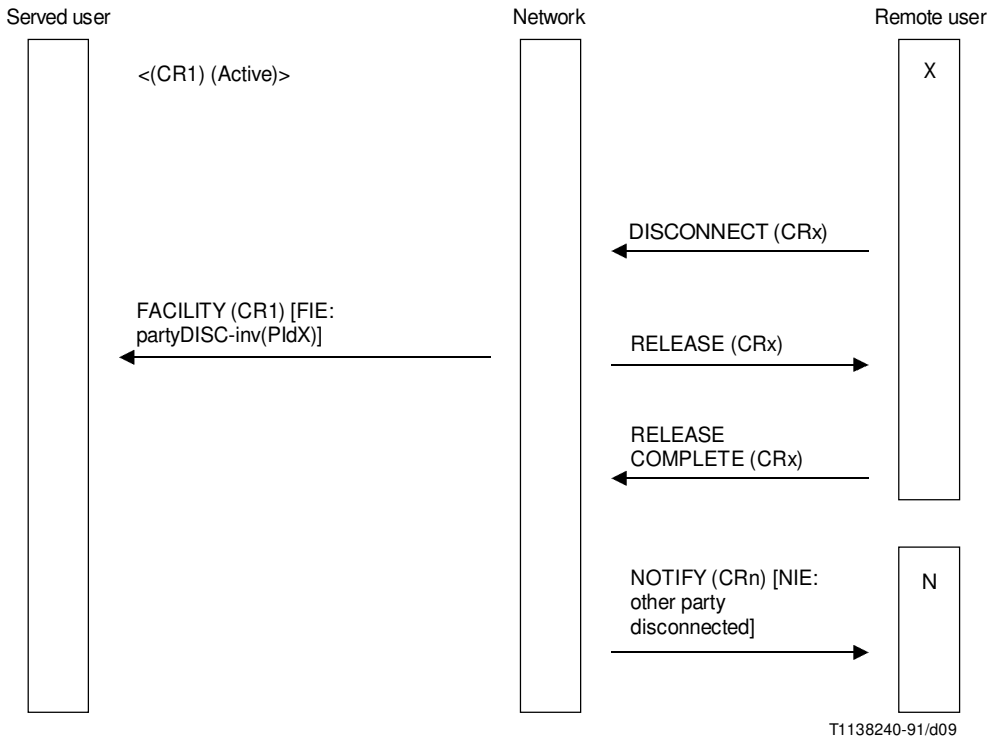


FIGURE 1-9/Q.954

Disconnect by party

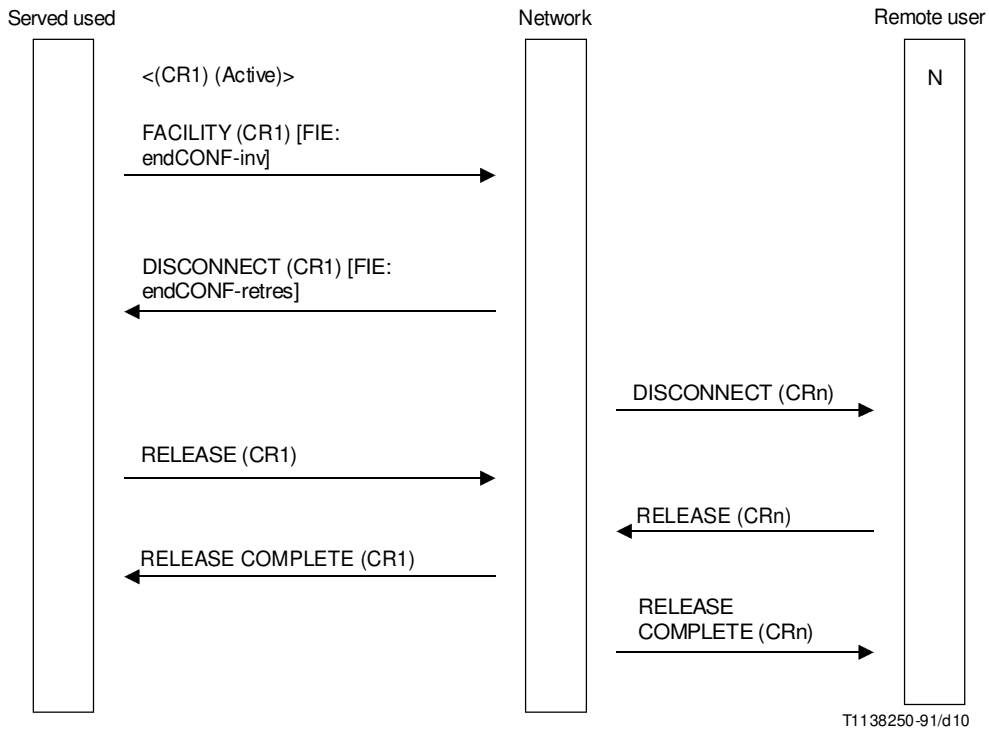


FIGURE 1-10/Q.954

Terminate the conference

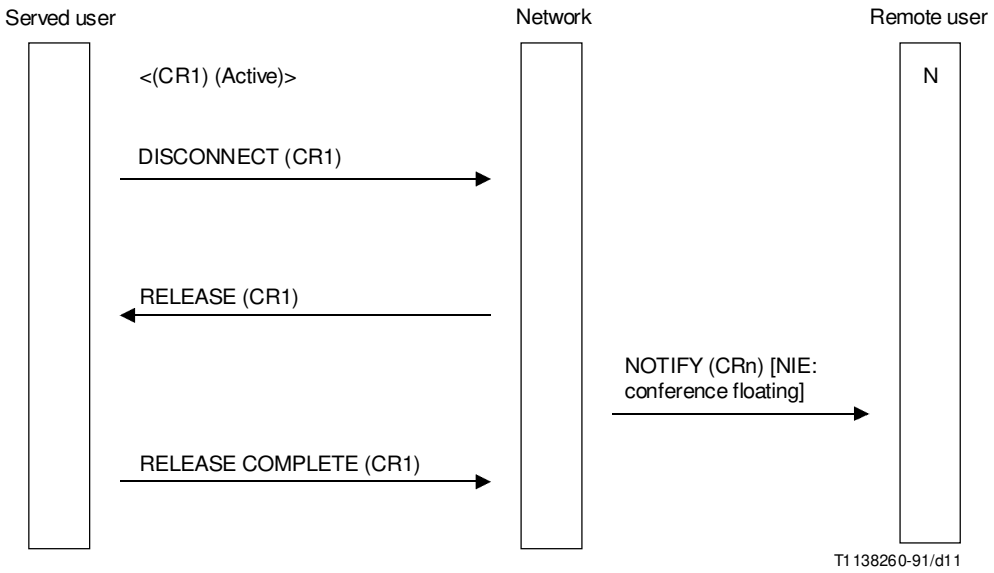


FIGURE 1-11/Q.954

Disconnect by served user when floating is allowed

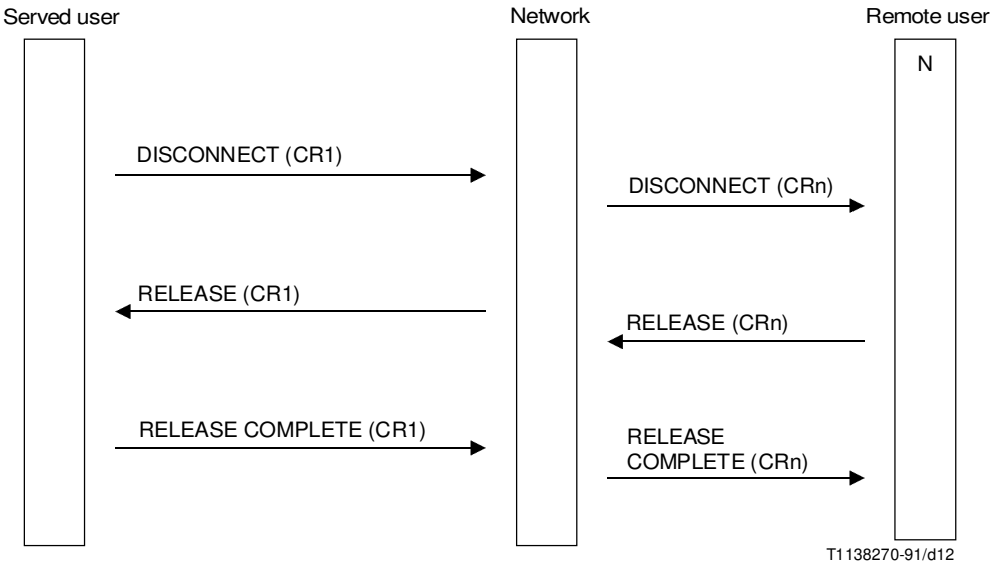


FIGURE 1-12/Q.954

Disconnect by served user when floating is not allowed

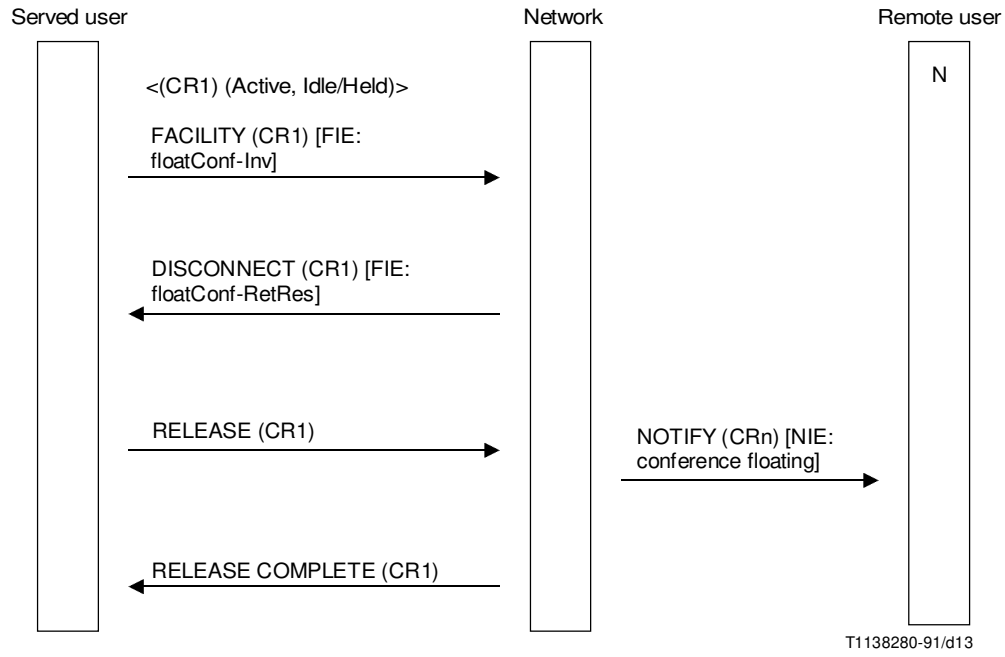


FIGURE 1-13/Q.954

Explicit request to disconnect the served user from the conference

1.9 Parameter values

Not applicable.

1.10 Dynamic description (SDLs)

Figure 1-14 shows the SDL diagram for the CONF supplementary service user process and Figure 1-15 shows the SDL diagram for the CONF supplementary service network process.

NOTE – The SDLs take into account the access protocol aspects only. The functional behaviour is not reflected in the SDLs.

The SDL diagrams are specified according to Recommendation Z.100 [6].

The SDLs make reference to the information flows CONF, CONF REJECT, ADD, ADD REJECT, SPLIT, SPLIT REJECT, ISOLATE, ISOLATE REJECT, REATTACH, REATTACH REJECT, DROP, DROP REJECT and INFORM 6 as specified in 1/Q.84 [7] and SETUP as specified in Recommendation Q.71 [3].

The SDLs for the local clearing procedure applied after a call has been added to the conference, are according to Recommendation Q.931 [2].

The SDLs for the notification procedure of the conferees are according to Recommendation Q.931 [2].

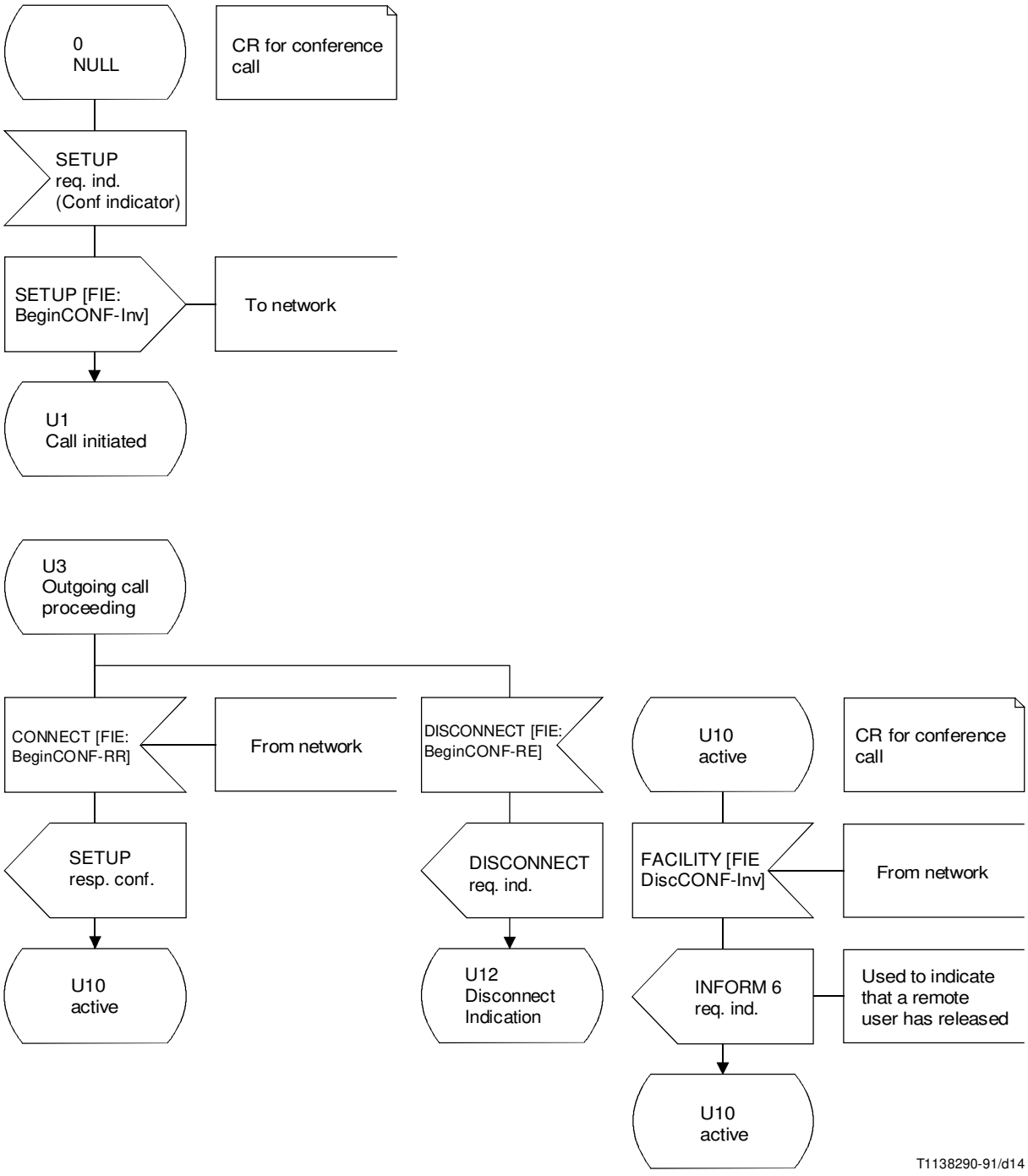


FIGURE 1-14/Q.954 (sheet 1 of 9)

User side SDL process

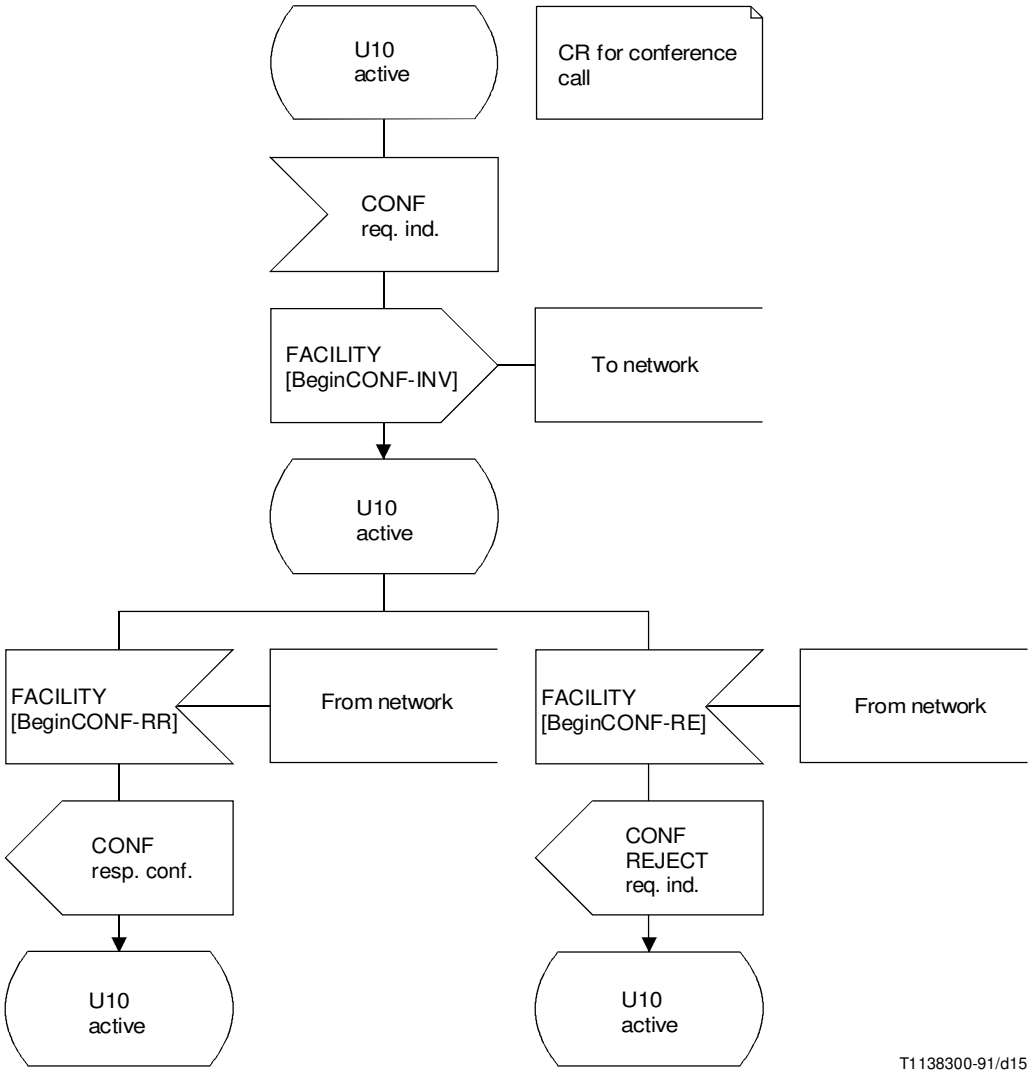


FIGURE 1-14/Q.954 (sheet 2 of 9)

User side SDL process

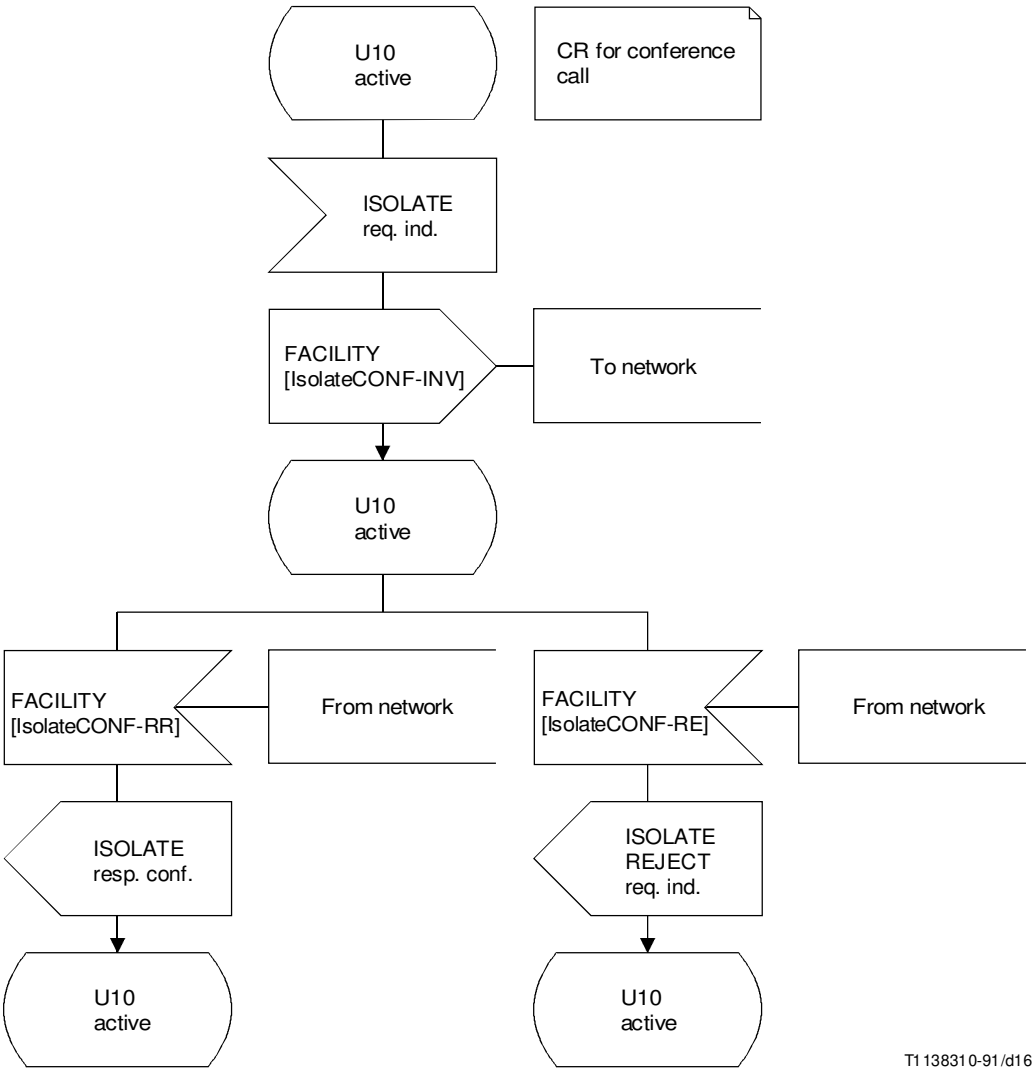


FIGURE 1-14/Q.954 (sheet 3 of 9)

User side SDL process

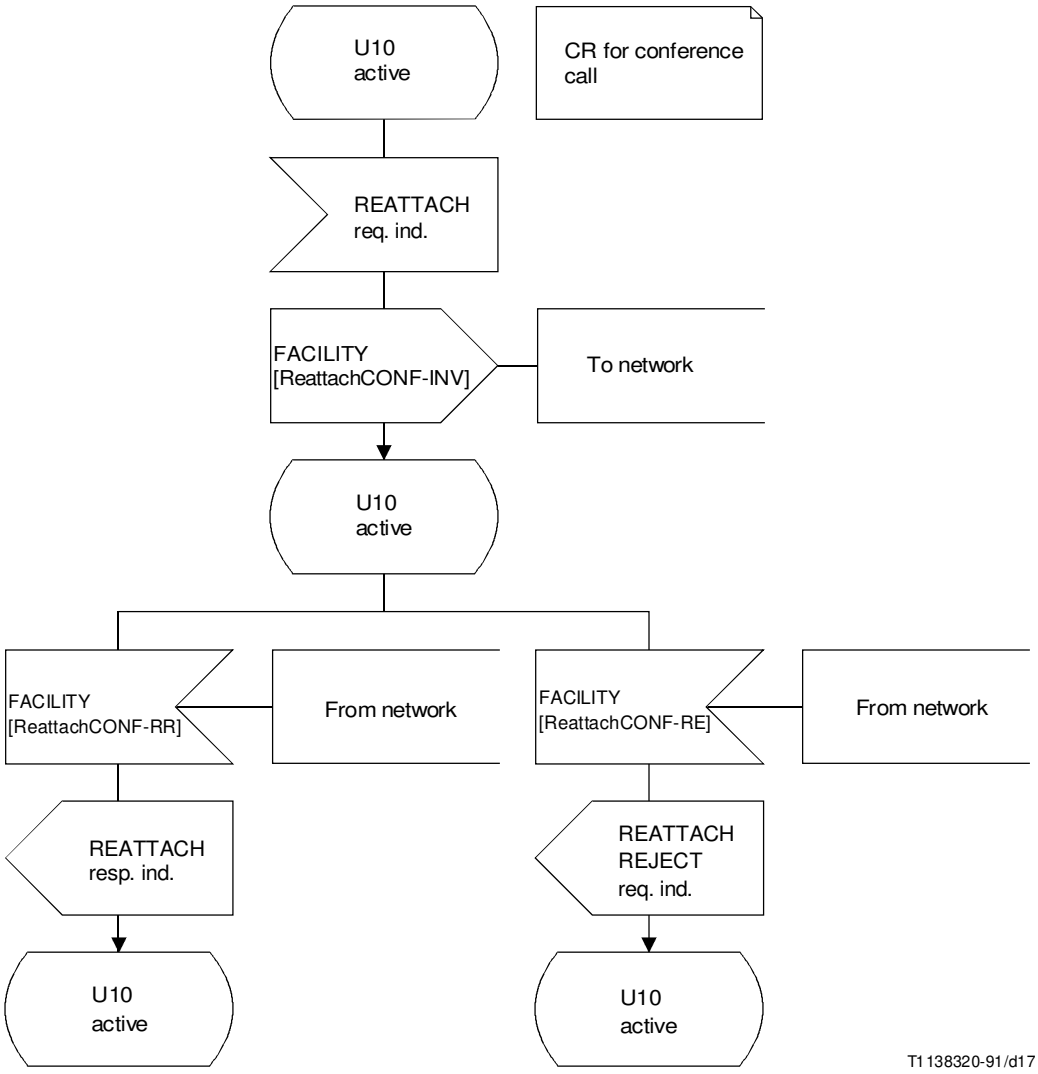


FIGURE 1-14/Q.954 (sheet 4 of 9)

User side SDL process

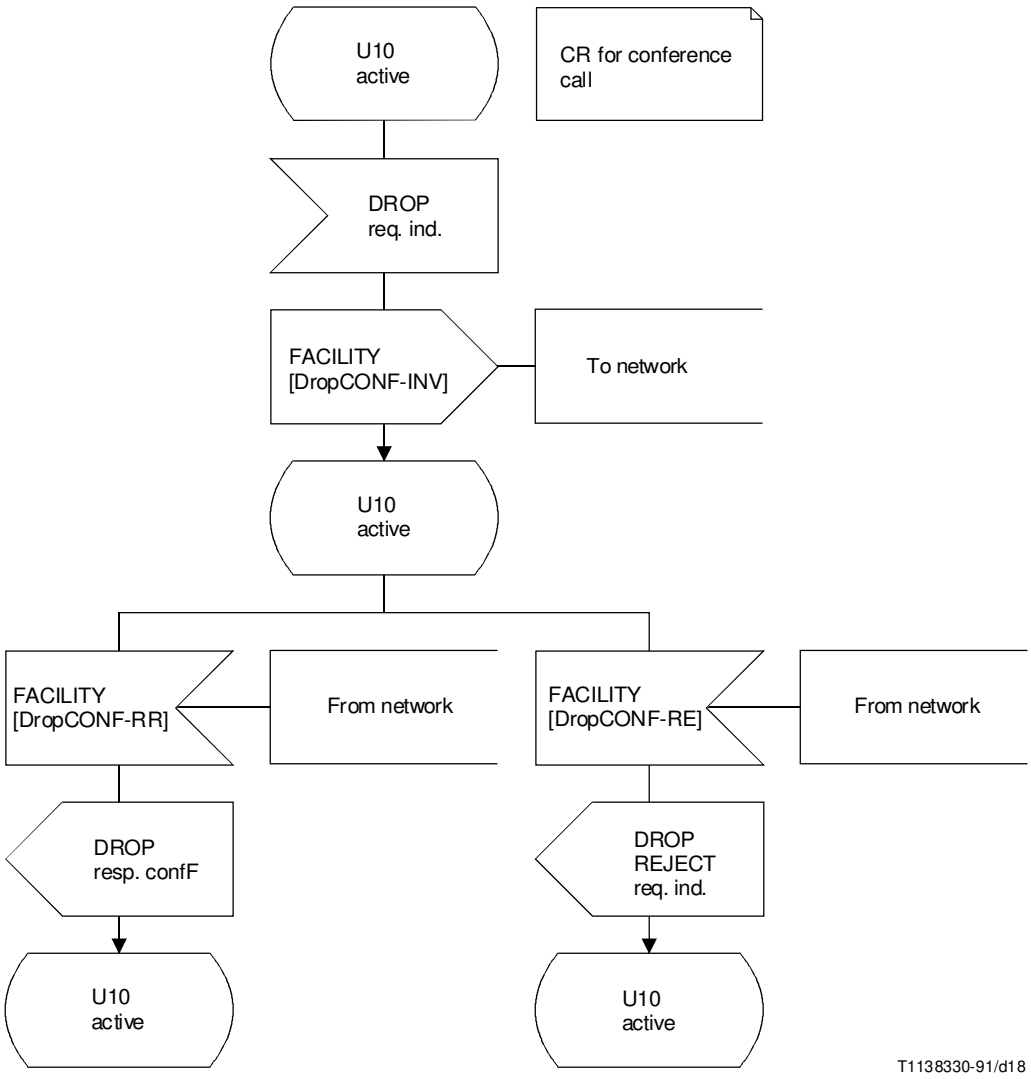


FIGURE 1-14/Q.954 (sheet 5 of 9)

User side SDL process

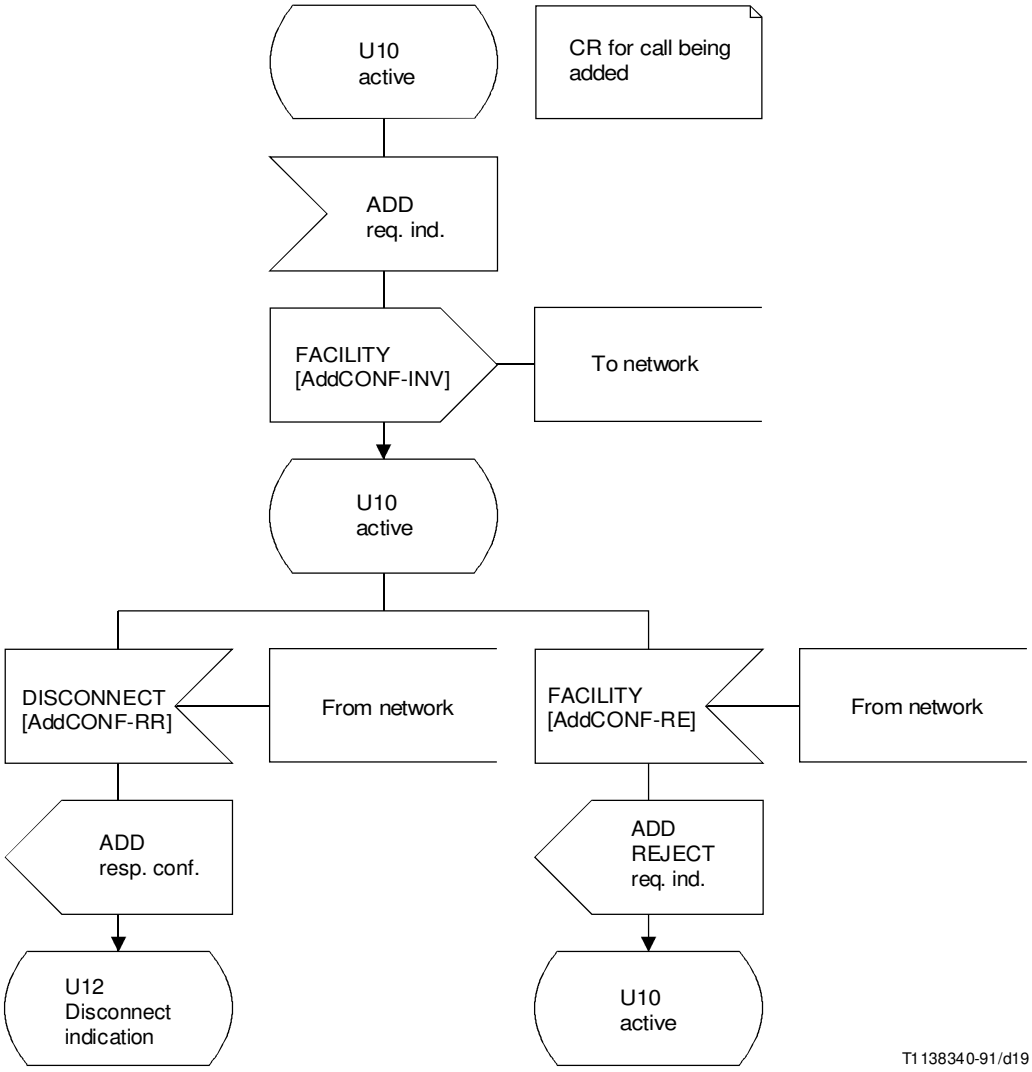


FIGURE 1-14/Q.954 (sheet 6 of 9)

User side SDL process

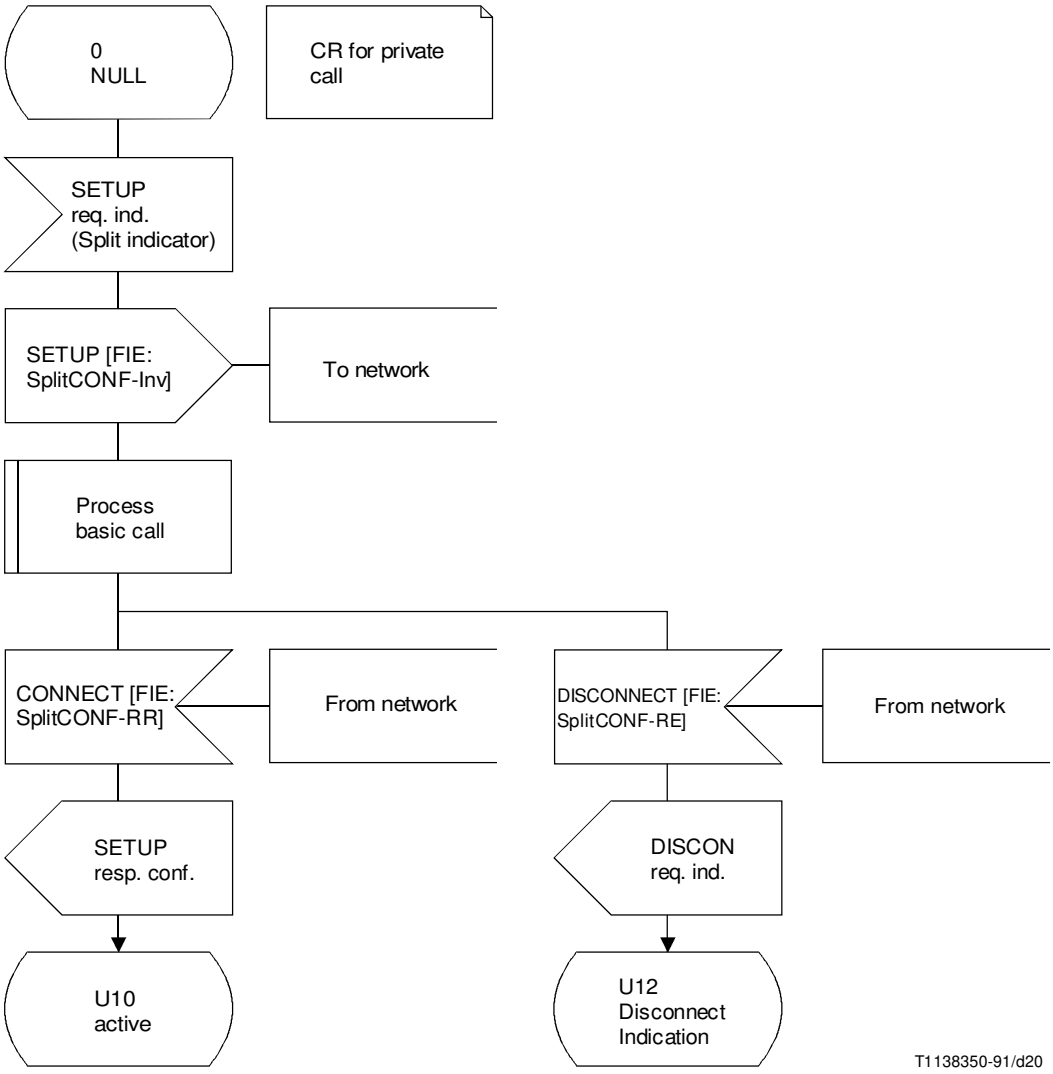


FIGURE 1-14/Q.954 (sheet 7 of 9)

User side SDL process

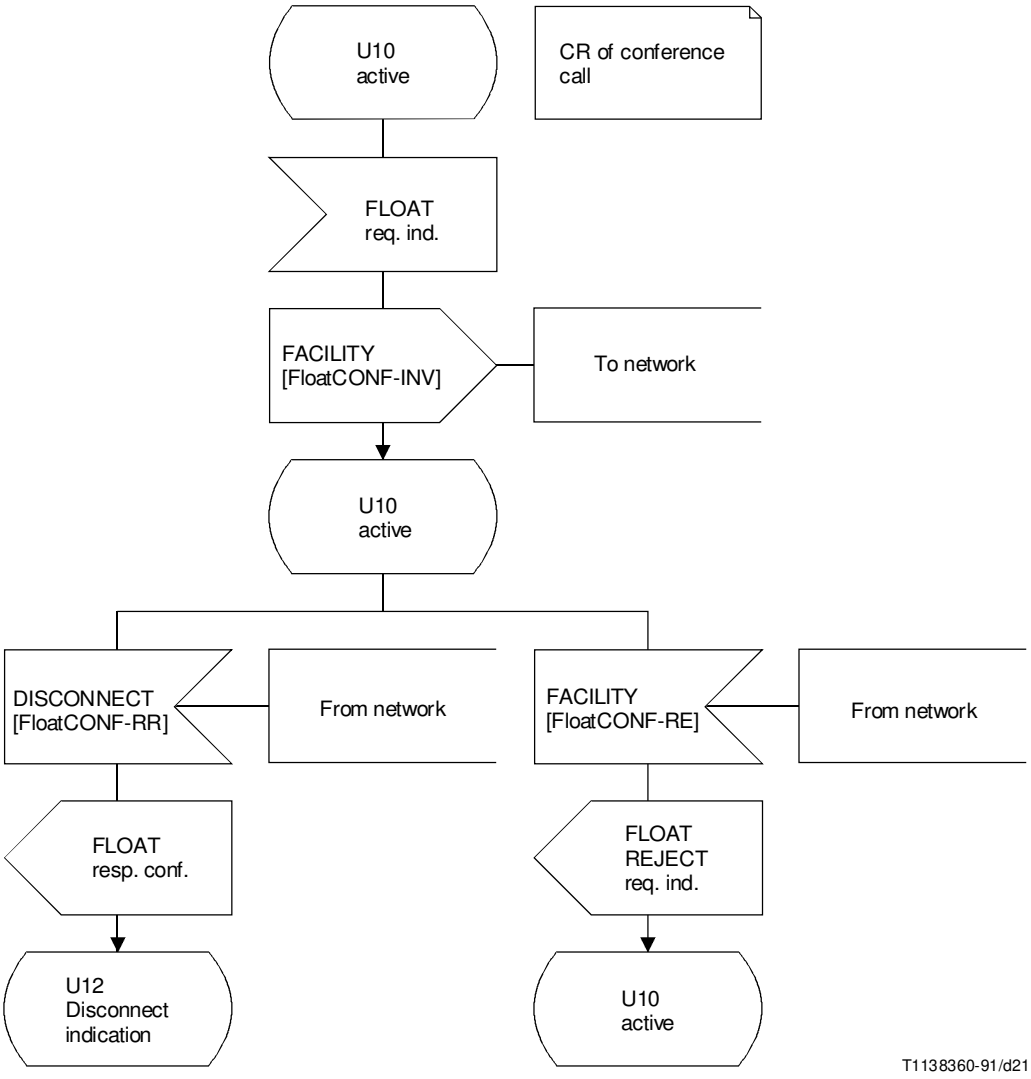


FIGURE 1-14/Q.954 (sheet 8 of 9)

User side SDL process

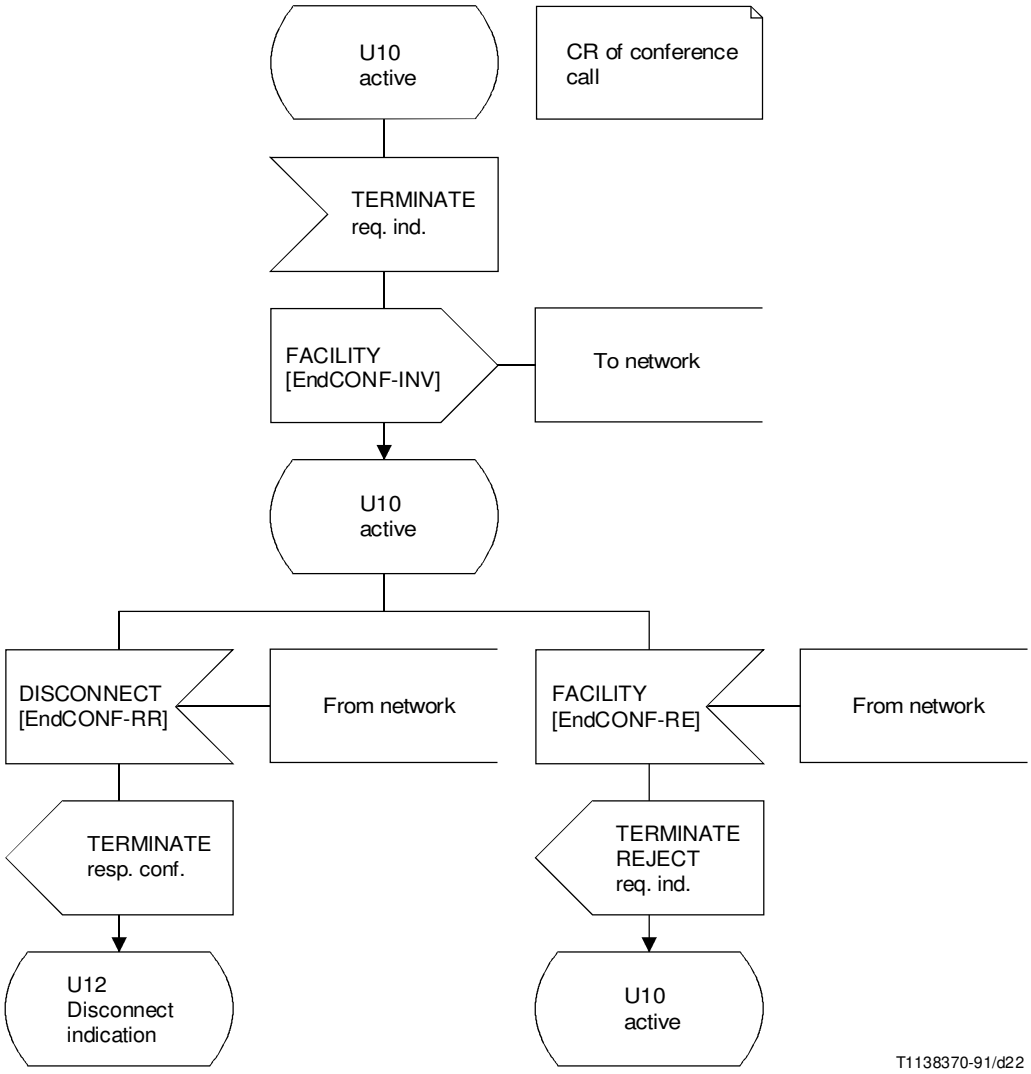


FIGURE 1-14/Q.954 (sheet 9 of 9)

User side SDL process

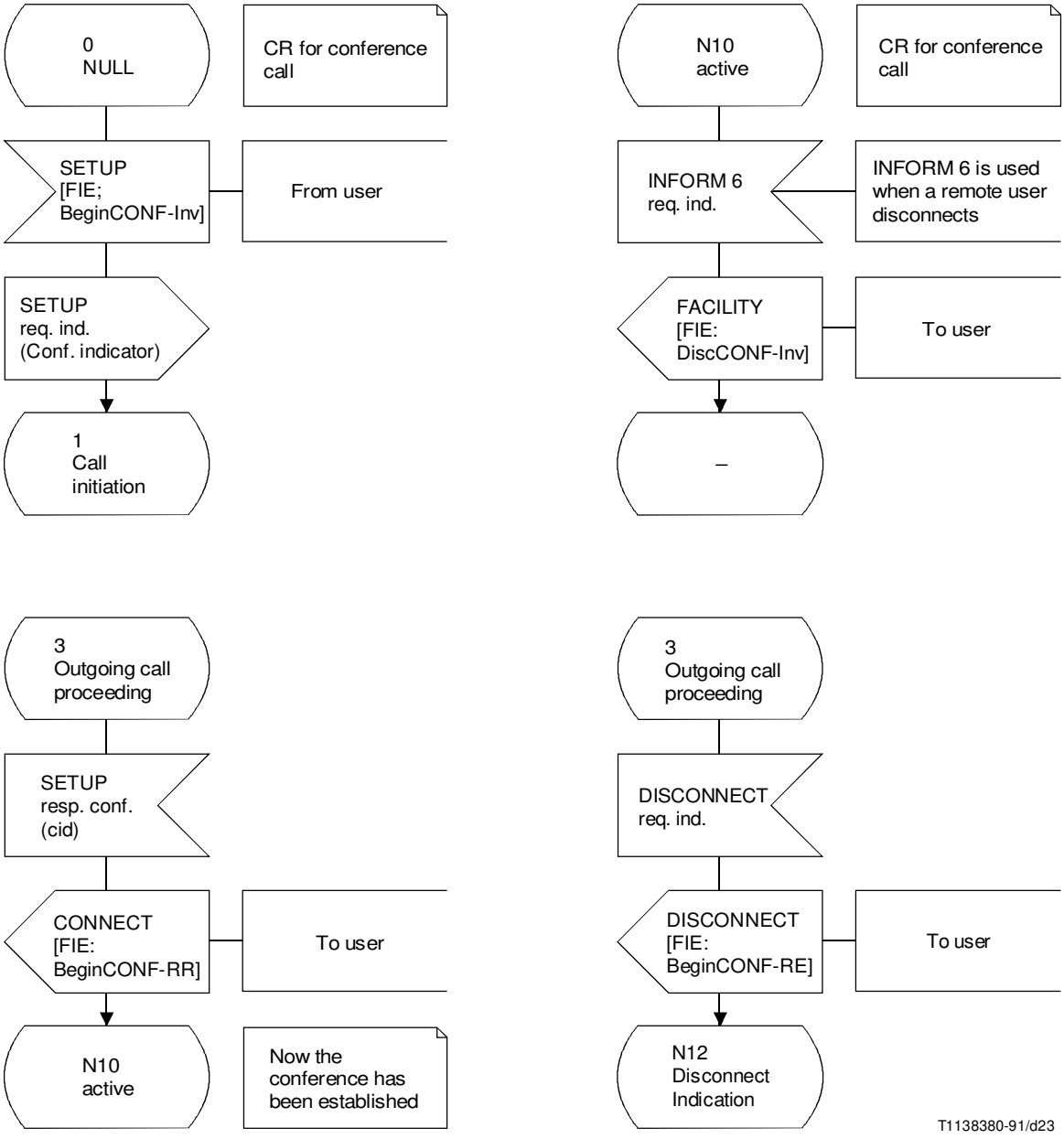


FIGURE 1-15/Q.954 (sheet 1 of 9)

Network side SDL process

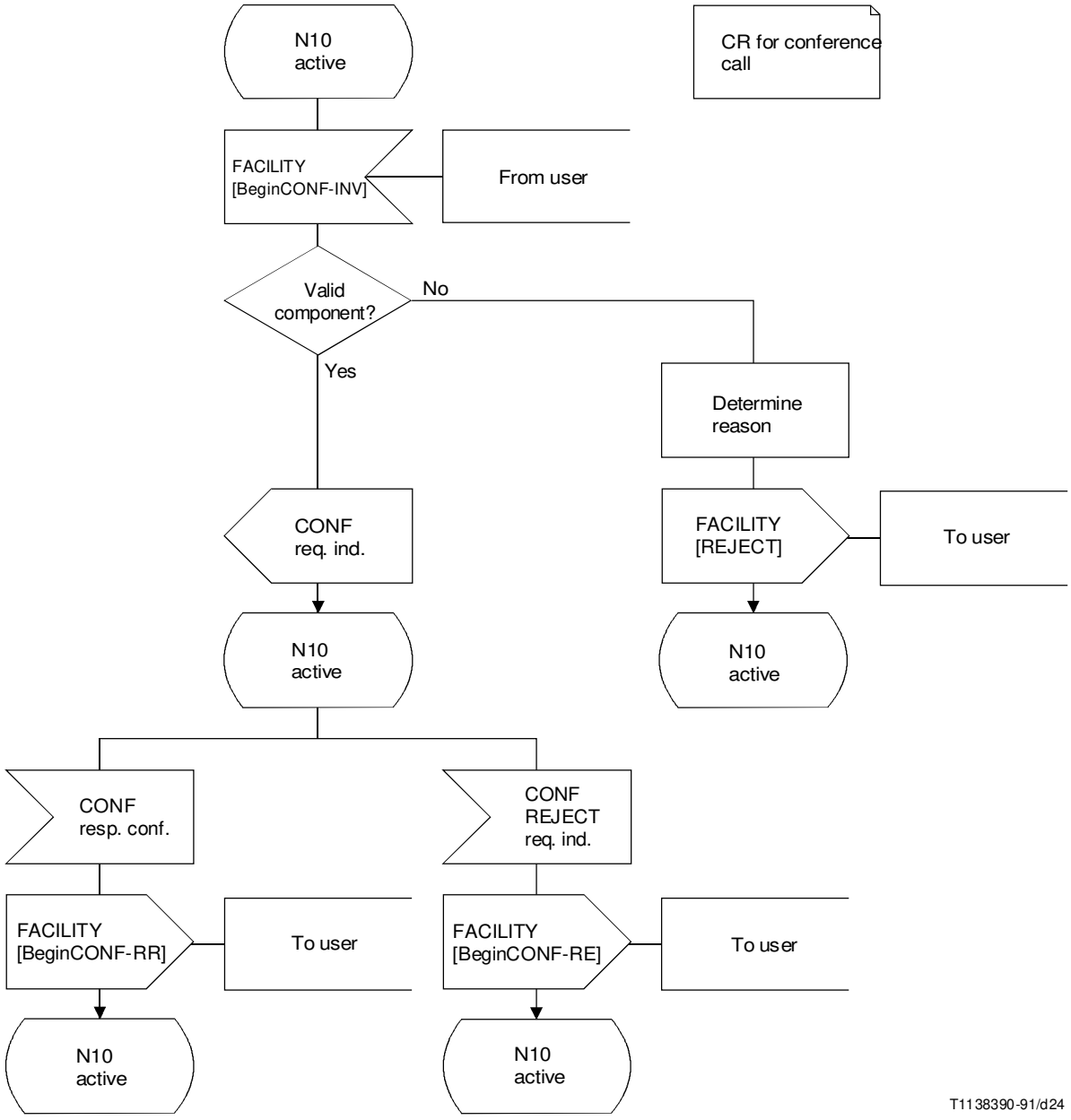


FIGURE 1-15/Q.954 (sheet 2 of 9)

Network side SDL process

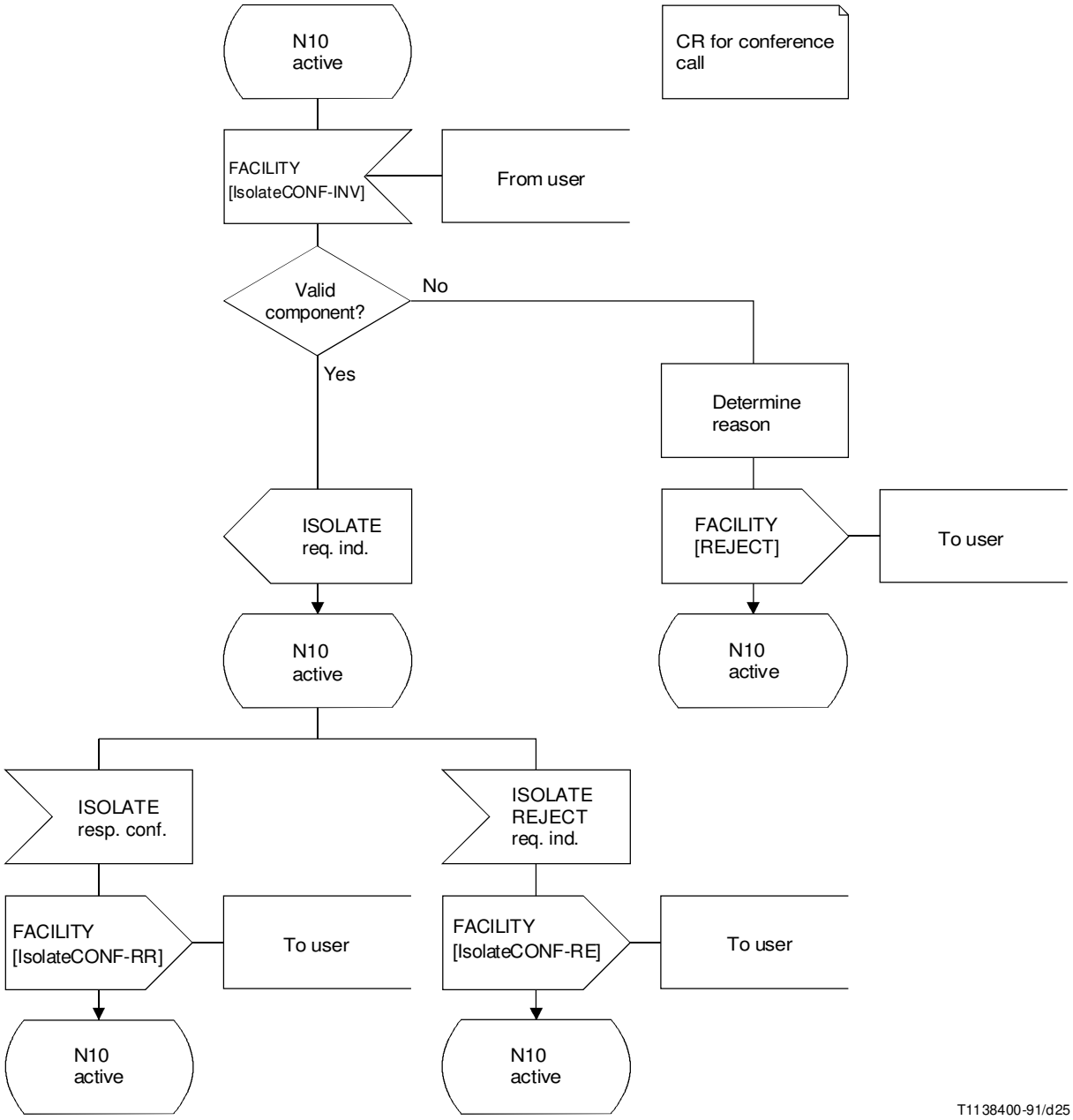


FIGURE 1-15/Q.954 (sheet 3 of 9)

Network side SDL process

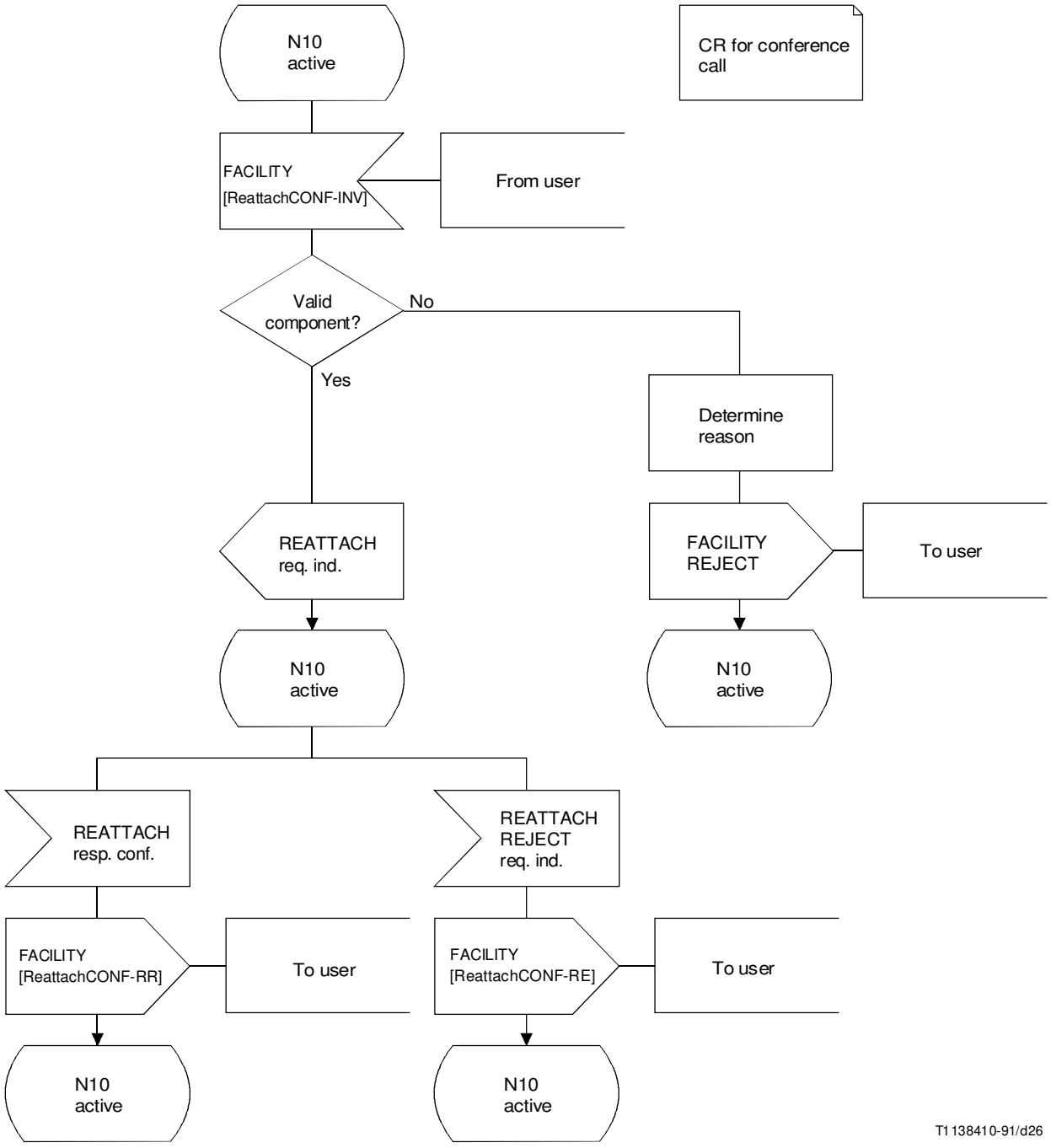


FIGURE 1-15/Q.954 (sheet 4 of 9)

Network side SDL process

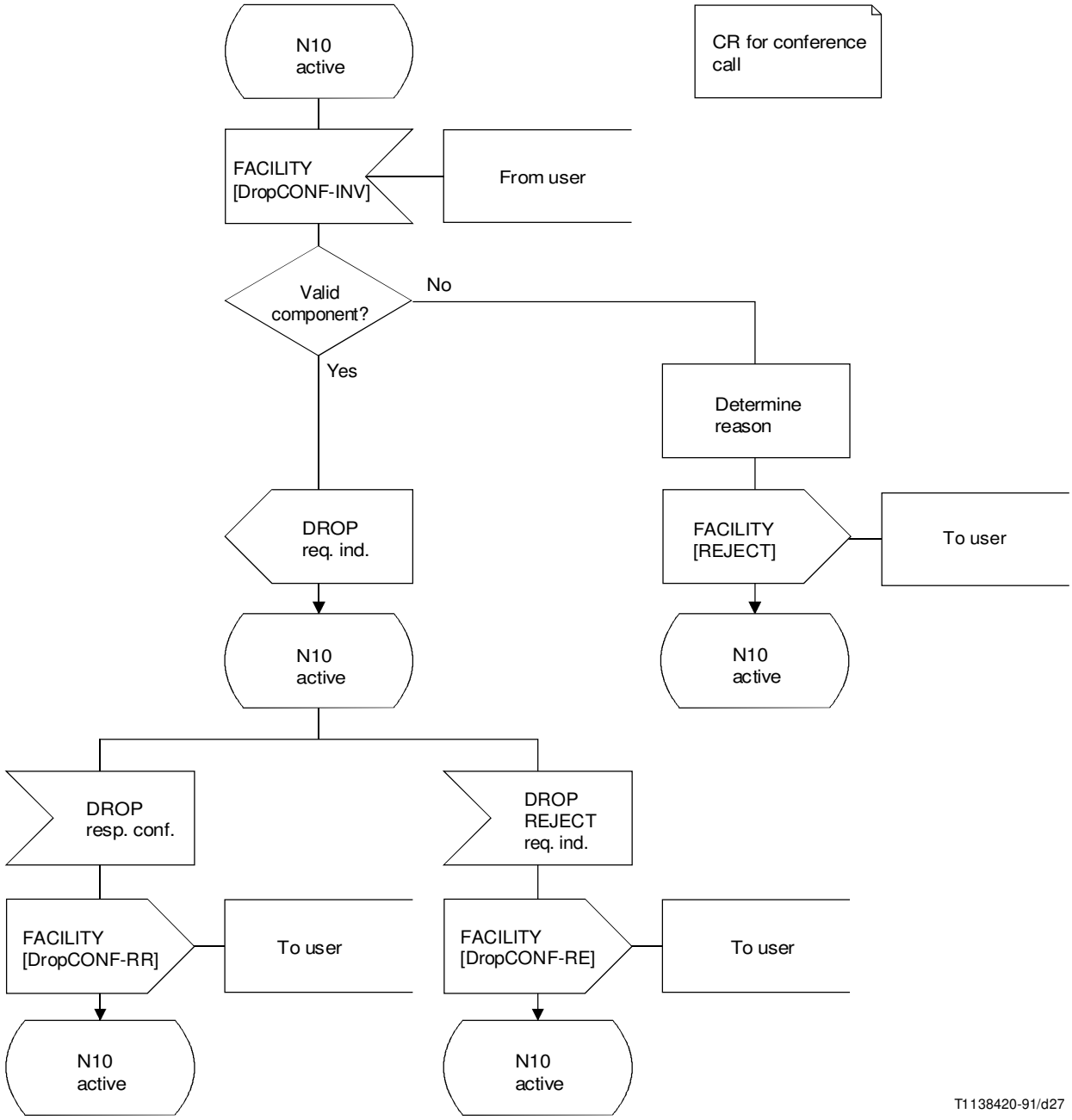


FIGURE 1-15/Q.954 (sheet 5 of 9)

Network side SDL process

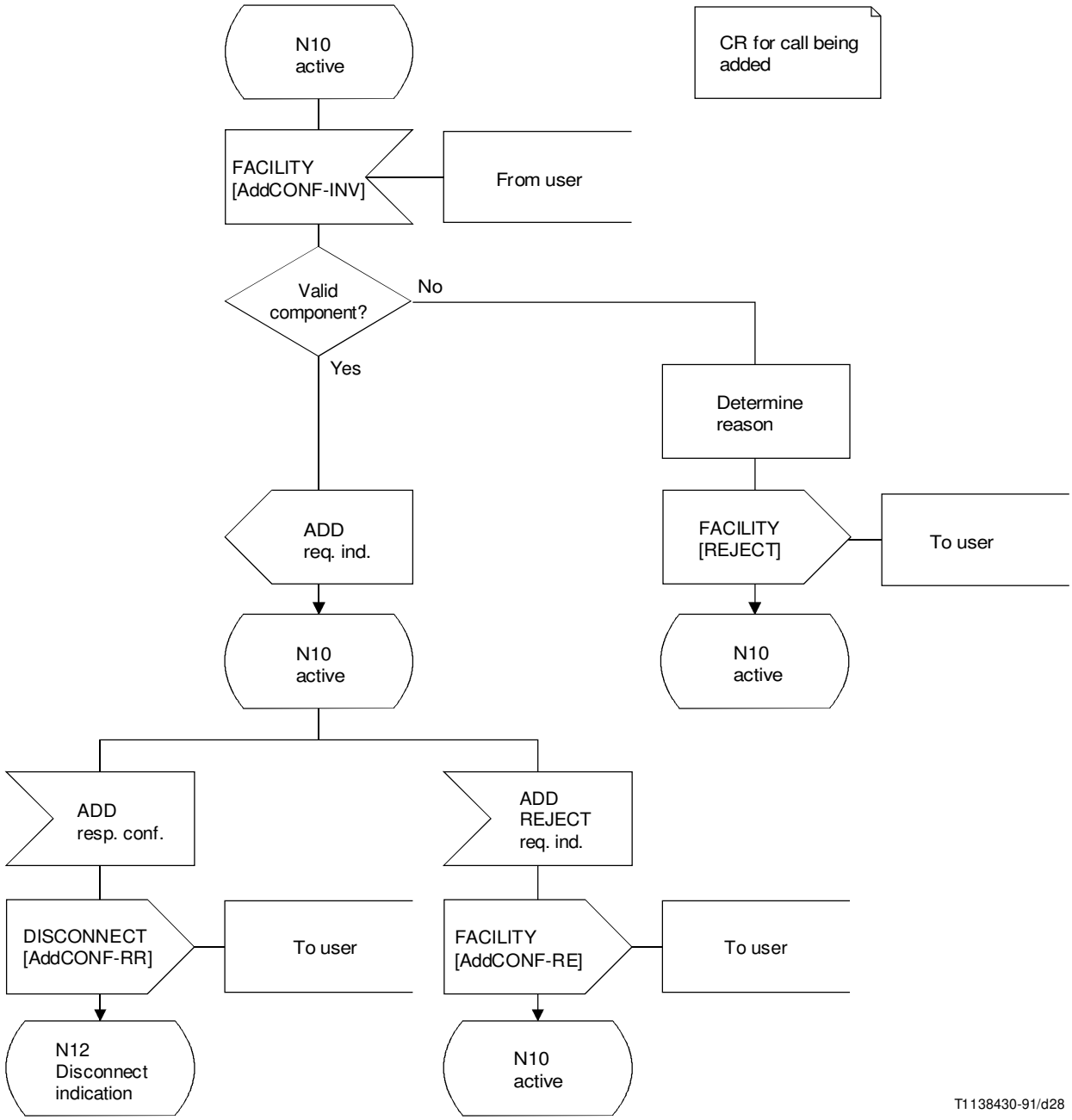


FIGURE 1-15/Q.954 (sheet 6 of 9)

Network side SDL process

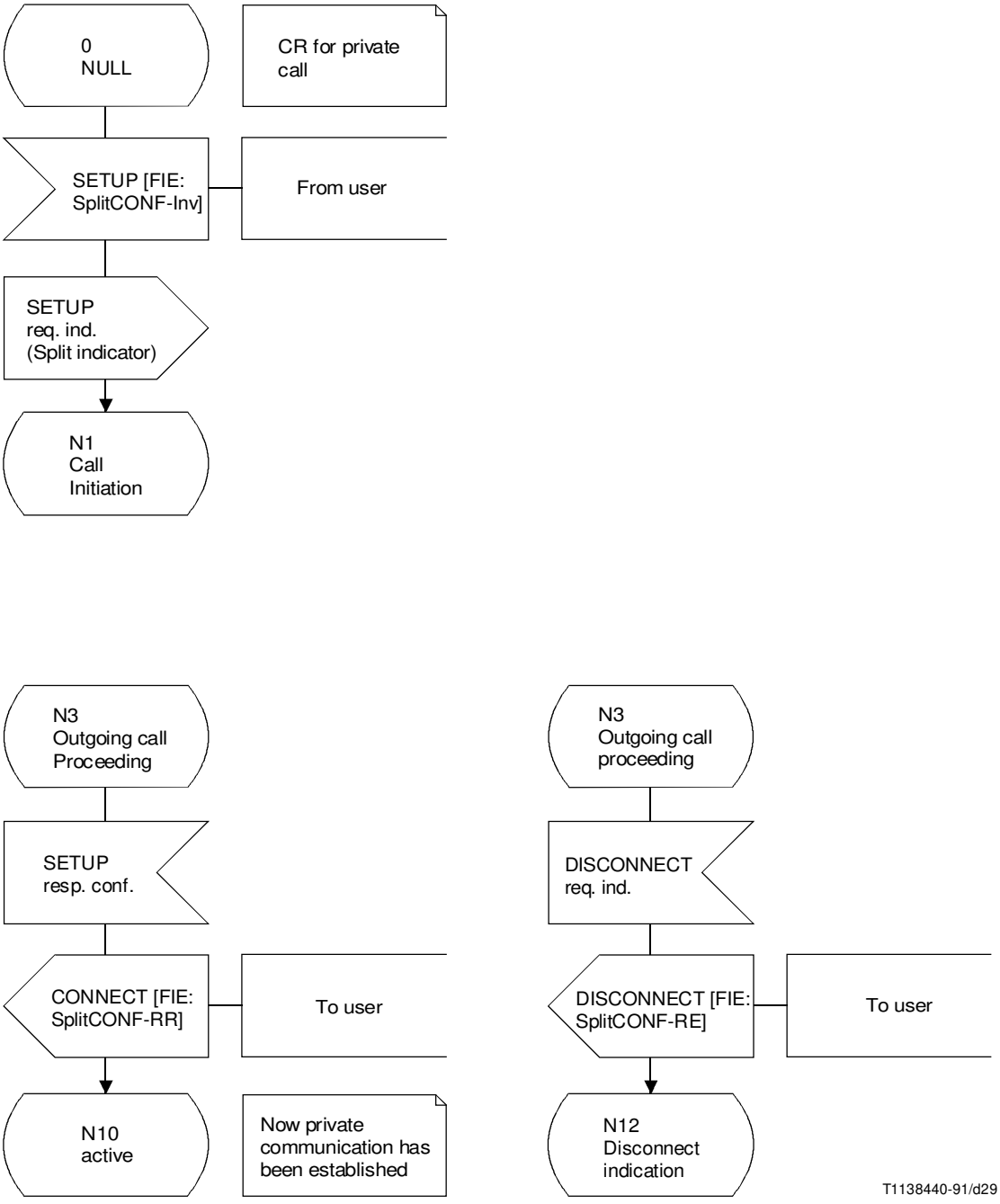


FIGURE 1-15/Q.954 (sheet 7 of 9)

Network side SDL process

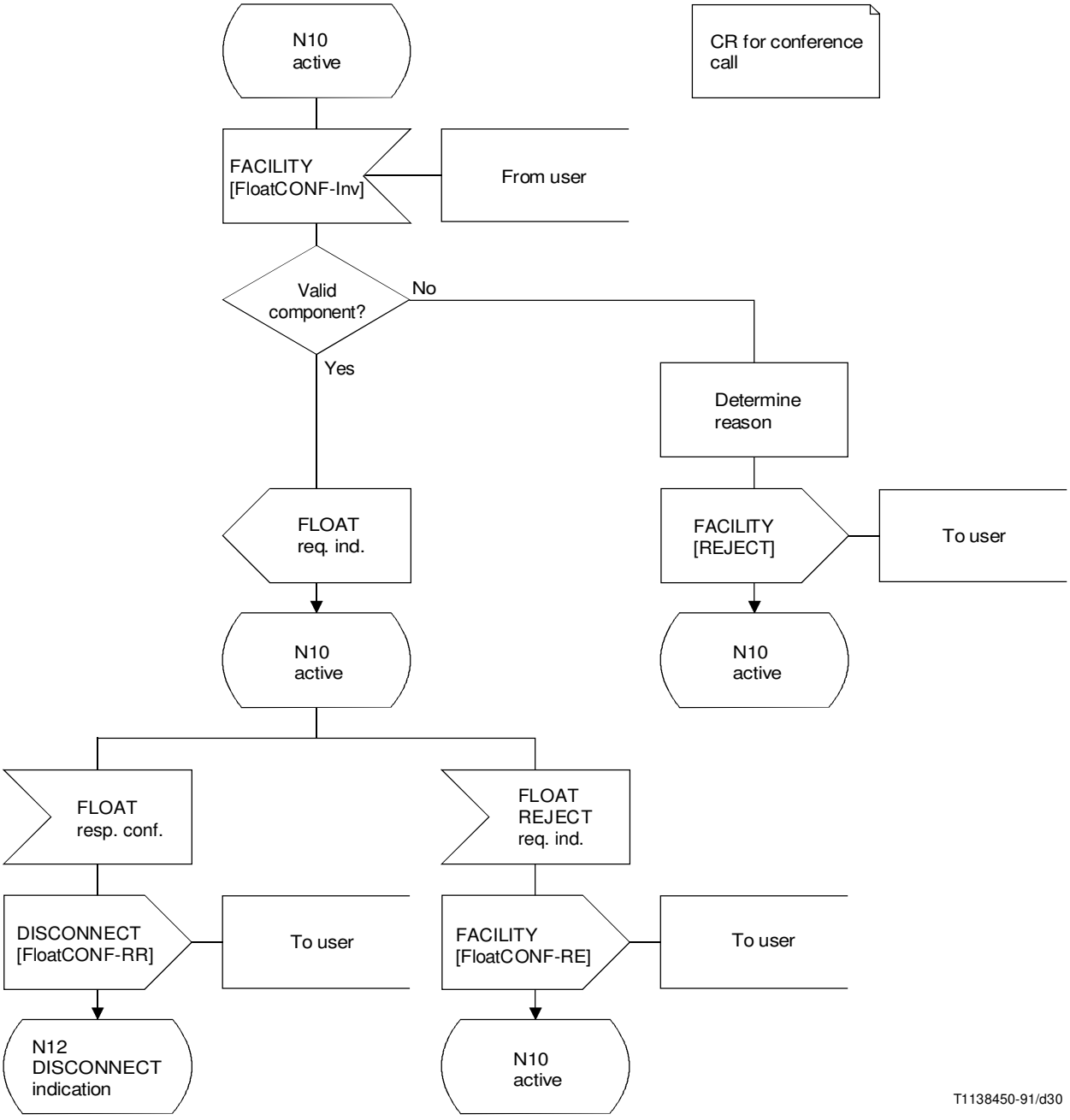


FIGURE 1-15/Q.954 (sheet 8 of 9)

Network side SDLprocess

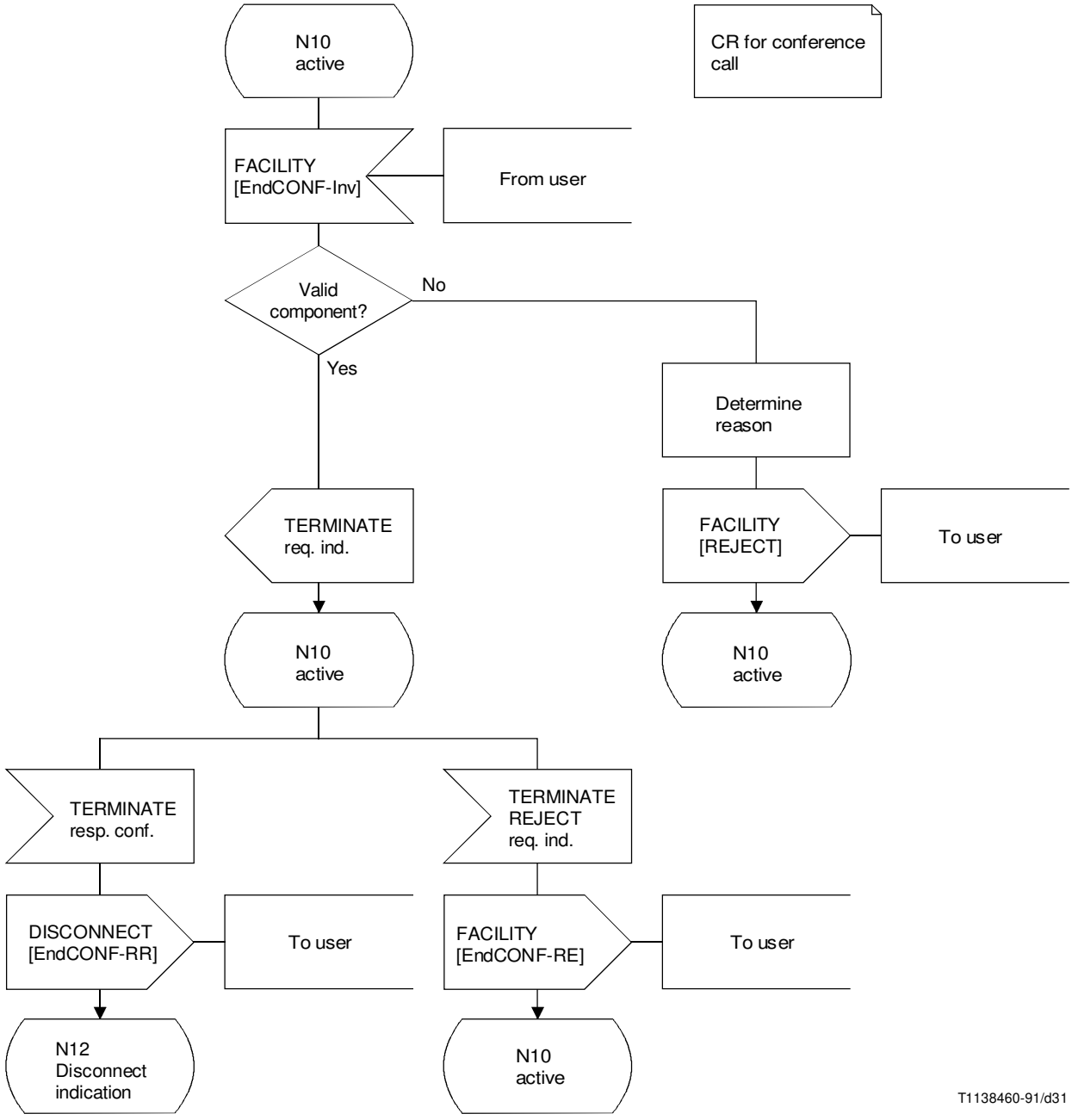


FIGURE 1-15/Q.954 (sheet 9 of 9)

Network side SDL process

2 Three-Party Service

2.1 Definition

The **three-Party supplementary service** enables a user to establish a three-party conversation.

2.2 Description

2.2.1 General description

The served user, who is involved in at least two calls (one active call and at least one call on hold), can join the active call and one held call into a three-way conversation by requesting the Three-Party supplementary service. Both calls shall be answered prior to the invocation of the Three-Party supplementary service.

During an active three-way conversation the served user at A can request that the service provider:

1) explicitly disconnects one of the parties;

2) terminates the three-way conversation;

3) creates a private communication with one of the parties.

2.2.2 Specific terminology

User

The DSS 1 protocol entity at the user side of the user-network interface.

Network

The DSS 1 protocol entity at the network side of the user-network interface.

Served user

During the invocation and active phases, the service is under the control of the "served user", i.e. the one for whom the service was invoked. This user is also referred to as "user A".

Remote parties (user B and user C)

The parties involved in the two calls that are joined together into a three-way conversation (user A with user B, user A with user C).

Invoke component

Defined in 8.2.5.1.1/Q.932.

Return result component

Defined in 8.2.5.1.1/Q.932.

Return error component

Defined in 8.2.5.1.1/Q.932.

2.2.3 Qualification on the applicability to telecommunication services

This supplementary service is applicable to the Telephony teleservice and the speech and 3.1 kHz audio bearer services. This supplementary service is not applicable to non-voice services.

2.2.4 States definitions

This supplementary service uses states defined for circuit basic call control procedures.

2.3 Operational requirements

2.3.1 Provision/withdrawal

The Three-Party supplementary service is subscribed to by prior arrangement with the service provider.

Withdrawal of the service is made by the service provider upon request by the subscriber or for service provider reasons.

2.3.2 Requirements on the originating network side

The hold supplementary service shall be available to the served user to allow the Three-Party supplementary service to be used by the served user.

2.3.3 Requirements in the network

Not applicable.

2.3.4 Requirements on the destination network side

The hold supplementary service shall be available to the served user to allow the Three-Party supplementary service to be used by the served user.

2.4 Coding requirements

In addition to the FACILITY message, this supplementary service makes use of messages identified for circuit basic call control procedures.

This supplementary service uses the following information elements:

- facility;
- notification indicator; and
- basic call control information elements.

2.4.1 Facility information element

Table 2-1 shows the definition of the operations required for the TPY supplementary service using ASN.1 as specified in Recommendation X.208 and using the OPERATION macro as defined in Figure 4/X.219.

2.4.2 Notification indicator information element

Table 2-2 contains the additional codepoints for the three-party supplementary service which shall be employed in Octet 3 of the notification indicator information element.

2.5 Signalling requirements

2.5.1 Activation/deactivation/registration

Not applicable.

2.5.2 Invocation and operation

NOTE – It is assumed that

- the call between users A and B is Active-Held and uses Call Reference x (CR x);
- the call between users A and C is Active-Idle and uses Call Reference y (CR y).

2.5.2.1 Beginning Three-Party Service

2.5.2.1.1 Normal operation

The served user, who is involved in at least two calls (one active call and at least one call on hold), can join the active call and one held call into a three-way conversation by requesting the Three-Party supplementary service.

TABLE 2-1/Q.954

Definition of operations and errors

```
CCITT-Three-Party-service-Operations
        { ccitt recommendation q 954 three-party (2) operations-and-errors (1) }

DEFINITIONS ::=

BEGIN

EXPORTS         BeginTPY, endTPY

IMPORTS         OPERATION
                FROM Remote-Operation-Notation
                { joint-iso-ccitt remote-operations(4)notation(0) }
                UsernotSubscribed,notAvailable, invalidCallState,
                resourceUnavailable,
                supplementaryServiceInteractionNotAllowed
                FROM General-Error-List
                { ccitt recommendation q 950 general-error-list (1) };

BeginTPY ::=        OPERATION
                RESULT
                ERRORS {
                UsernotSubscribed,notAvailable,invalidCallState,
                resourceUnavailable,
                supplementaryServiceInteractionNotAllowed }


EndTPY ::=      OPERATION
                RESULT
                ERRORS  {
                invalidCallState }


beginTPY    BeginTPY        ::= 4

endTPY      EndTPY          ::= 5

END
```

TABLE 2-2/Q.954

Additional codepoints in the notification indicator information element

Bits 7 6 5 4 3 2 1	Meaning
1 0 0 0 0 1 0	Conference established
1 0 0 0 0 1 1	Conference disconnected

User A sends a FACILITY message to the network, containing the Call reference of the Active-Held call (CR x) and a beginTPY invoke component in the Facility information element. The network accepting this request shall connect the three-way path and return a FACILITY message (CR x) to user A, containing a beginTPY return result component in the Facility information element.

Then, as an option, the network can send a NOTIFY message to user B and to user C, containing a "Conference established" indication in the Notification indicator information element.

2.5.2.1.2 Exceptional procedures

2.5.2.1.2.1 At the user side

If, after having sent a FACILITY message carrying a beginTPY invoke component, user A receives a FACILITY message with a return error component or a reject component, the three-way conversation is assumed not to be activated and remains idle.

2.5.2.1.2.2 At the network side

If the network receives a FACILITY message, with the call reference of an active-idle call, containing a beginTPY invoke component, the network shall reject the three-way connection request and return a FACILITY message to user A, containing a return error component "invalid call state".

If the network receives a FACILITY message, with the call reference of an Active-held call, containing a beginTPY invoke component that cannot be accepted, the network should reject the request and return a FACILITY message to user A, containing a return error component with one of the following:

- not subscribed;
- resource unavailable;
- not available;
- supplementary service interaction not allowed.

If, while a three-way conversation is already in operation, the network receives a FACILITY message containing a beginTPY invoke component for that same user A, the network should reject the request and return a FACILITY message to user A, containing a return error component "Supplementary service interaction not allowed".

2.5.2.2 Managing an active three-way conversation

During an active three-way conversation:

- User A can
  - explicitly disconnect one of the parties;
  - terminate the three-way conversion;
  - create a private communication with one of the parties.
- Either of the remote parties (user B or user C) can request that the network releases it from the three-way conversation.

2.5.2.2.1 Normal operation

2.5.2.2.1.1 To explicitly disconnect one of the parties

To disconnect one of the parties, user A shall send a DISCONNECT message to the network, containing the appropriate call reference:

- On receipt of a DISCONNECT message containing CR x (that call was in the "active-held" auxiliary state), the network shall return a RELEASE message to the user, release the three-way connection and all resources associated with the call A $\leftrightarrow$ B. This results in a simple active call between users A and C. In addition, and as an option, a NOTIFY message containing the notification indicator coded as "Conference disconnected" can be sent to user C.
- On receipt of a DISCONNECT message containing CR y (that call was in the "active-idle" auxiliary state), the network shall return a RELEASE message to the user, release the three-way connection and all resources associated with the call A $\leftrightarrow$ C, and reserve a B-channel for the user. In addition, and as an option, a NOTIFY message containing the notification indicator coded as "Conference disconnected" can be sent to user B.

  Furthermore, user A shall send a RETRIEVE message containing CR x to the network, in order to retrieve the held call between A and B. The network shall then follow the hold procedures. This results in a simple active call between users A and B.

2.5.2.2.1.2 To terminate the three-way conversation

To terminate the three-way conversation, user A shall send two DISCONNECT messages to the network:

- for the first DISCONNECT message, see the procedures described in 2.5.2.2.1.1;
- for the second DISCONNECT message, normal call clearing procedures apply (see Recommendation Q.931).

2.5.2.2.1.3 To create a private communication with one of the parties

To create a private communication with one of the other parties, user A shall send a FACILITY message to the network, containing the call reference of one of the two calls, and a endTPY invoke component in the Facility information element. The network accepting this request shall return a FACILITY message to user A, containing a endTPY return result component in the Facility information element. As an option, the network can also send a NOTIFY message to the remote users, containing a Notification indicator information element coded as "Conference disconnected".

In addition, as the call A $\leftrightarrow$ B is still Active-held and the call A $\leftrightarrow$ C still active-Idle, if user A wants to create a private communication with user B, user A shall send a HOLD message containing CR y, and then a RETRIEVE message containing CR x. Then the hold and retrieve procedures shall apply.

2.5.2.2.2 Exceptional procedures

2.5.2.2.2.1 At the user side

If user A, involved in an active three-way conversation, has sent to the network a FACILITY message carrying a endTPY invoke component, and receives a FACILITY message with a return error component or a reject component, the three-way conversation will remain activated.

2.5.2.2.2.2 At the network side

If the network receives a FACILITY message containing a endTPY invoke component for a call reference which is not involved in an active three-way conversation, the network should return a FACILITY message to the user, containing a return error component "invalid call state".

2.5.2.3 Remote users request during the three-way conversation

To release from the three-way conversation:

User B (or C) sends a DISCONNECT message to the network. On receipt of this request, the network shall release the three-way connection and apply normal call clearing procedures regarding that call. The B-channel at user A interface is retained for the remaining call.

As an option, the network can also send a NOTIFY message to the other remote user, containing a notification indicator information element coded as "conference disconnected".

2.6 Interactions with other supplementary services

2.6.1 Call Waiting

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.2 Call Transfer

If the served user requests to transfer a call and this call is already involved in a three-way conversation as requested by the served user, the network shall apply the procedure described in 2.5.2.1.2, indicating the error "Supplementary service interaction not allowed".

2.6.3 Connected Line Identification Presentation

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.4 Connected Line Identification Restriction

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.5 Calling Line Identification Presentation

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.6 Calling Line Identification Restriction

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.7 Closed User Group

If the CUG restrictions are not met, the network shall apply the procedure described in 2.5.2.1.2.2 indicating the error "supplementary service interaction not allowed".

2.6.8 Conference Calling

2.6.8.1 Add-on Conference

If the served user requests to join two calls and one of the calls is a conference call established by the served user, the network shall apply the procedure described in 2.5.2.1.2.2 indicating the error "supplementary service interaction not allowed".

2.6.8.2 Meet-me Conference

If the service provider is able to identify that a call belongs to a meet-me conference, then it shall take the appropriate measures to prevent a meet-me conference call from being joined with another call into a three-way conversation. For rejection of the three-way conversation request, the network shall apply the procedure described in 2.5.2.1.2.2 indicating the error "supplementary service interaction not allowed".

2.6.9 Direct-Dialling-In

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.10 Call diversion services

2.6.10.1 Call Forwarding Busy

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.10.2 Call Forwarding No Reply

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.10.3 Call Forwarding Unconditional

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.10.4 Call Deflection

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.11 Line Hunting

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.12 Three-Party Service

If the served user requests to join two calls and one of the calls is already involved in a three-way conversation as established by the served user, the network shall apply the procedure described in 2.5.2.1.2.2 indicating the error "supplementary service interaction not allowed".

2.6.13 User-to-User Signalling

User-to-user signalling services 1, 2 and 3 are offered according to Q.931 procedures. The routing of UUI between users A and B, and between users A and C, uses the associated call references.

2.6.14 Multiple Subscriber Number

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.15 Call Hold

If the three-way conversation is held or retrieved, no Notify message shall be sent to the remote users.

2.6.16 Advice of Charge

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.17 Sub-addressing

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.18 Terminal Portability

If the 3TPY served user requests the terminal portability supplementary service, the network shall reject this request in a SUSPEND REJECT message indicating the error "Facility rejected".

2.6.19 Completion of Calls to Busy Subscriber

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.20 Malicious Call Identification

No impact, i.e. neither supplementary service affects the operation of the other supplementary service.

2.6.21 Reverse Charging

For further study.

2.6.22 Multi-Level Precedence and Preemption

The interaction of three-way conversation with MLPP is specified in the DSS 1 MLPP service description (see 3/Q.955).

2.7 Interactions with other networks

2.7.1 Interaction with non-ISDNs

Users B and C belonging to a non-ISDN may not be notified of changes occurring.

2.7.2 Procedures for interworking with private ISDNs

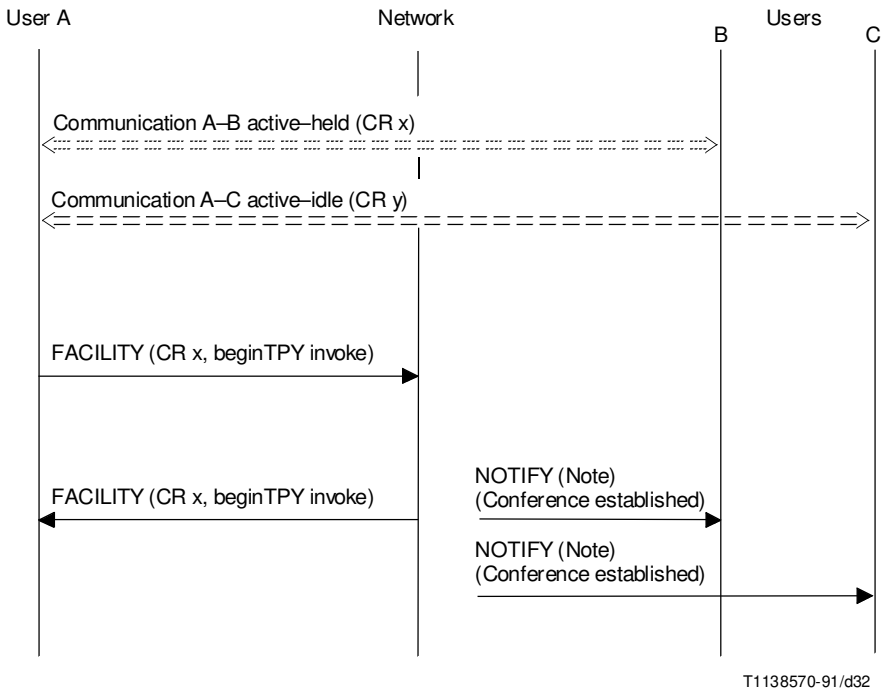
The procedures described in 2.5 are not appropriate for private networks to request the Three-Party supplementary service as provided by the public network.

Appropriate notifications sent by a private ISDN should be transferred through a public ISDN to the remote user.

If the remote user resides in a private ISDN, the public network shall send the notifications to the private ISDN according to the procedures of 2.5.

2.8 Signalling flows

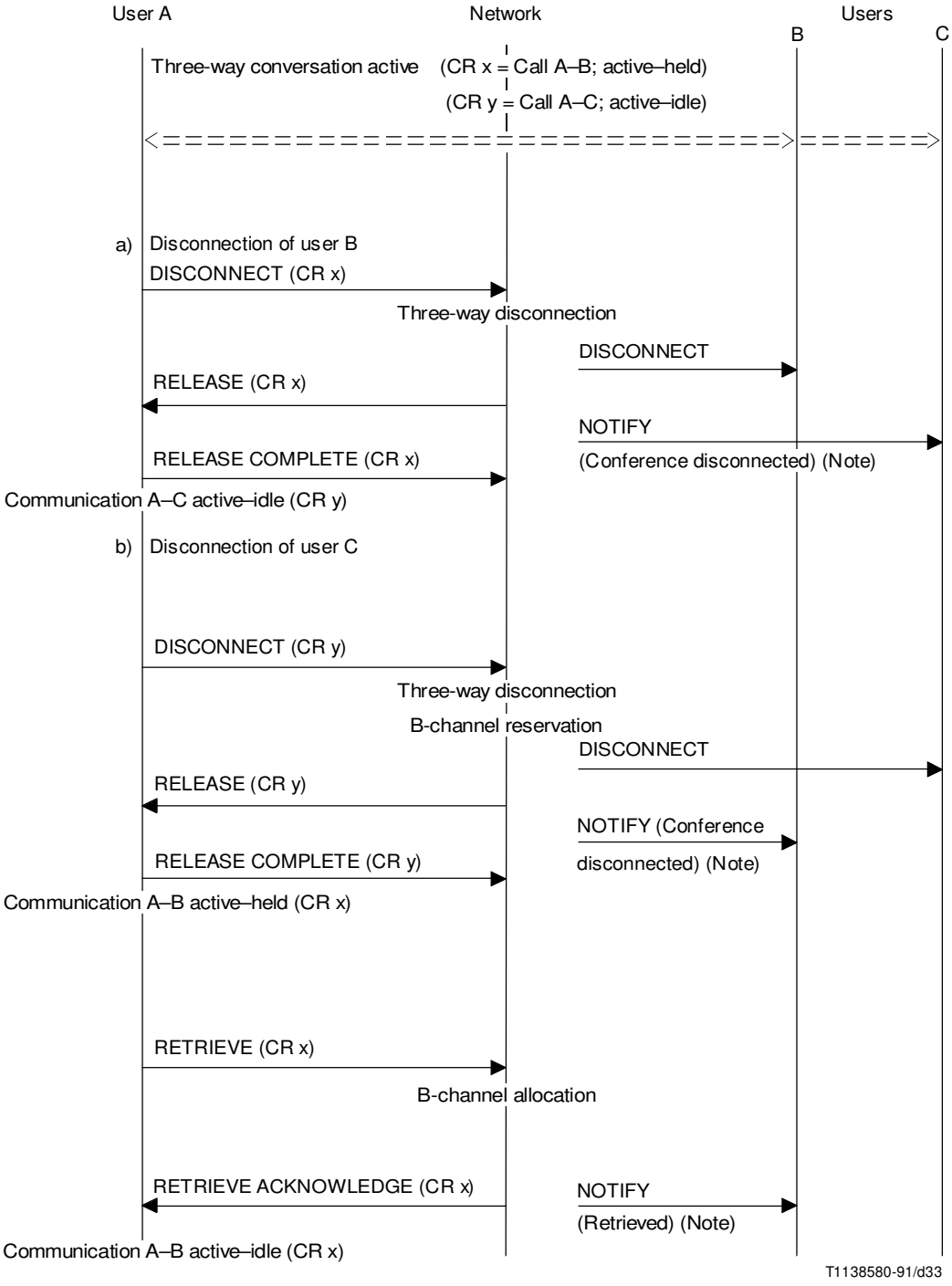
See Figures 2-1 to 2-5.



NOTE – The sending of notification is optional.

FIGURE 2-1/Q.954

Three-way conversation request



NOTE – The sending of notification is optional.

FIGURE 2-2/Q.954

User A request to explicitly disconnect one of the parties

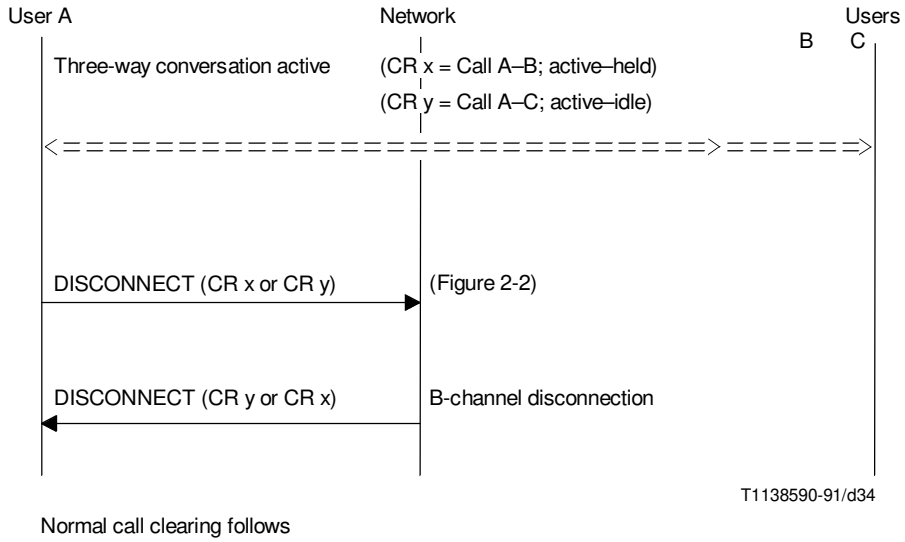
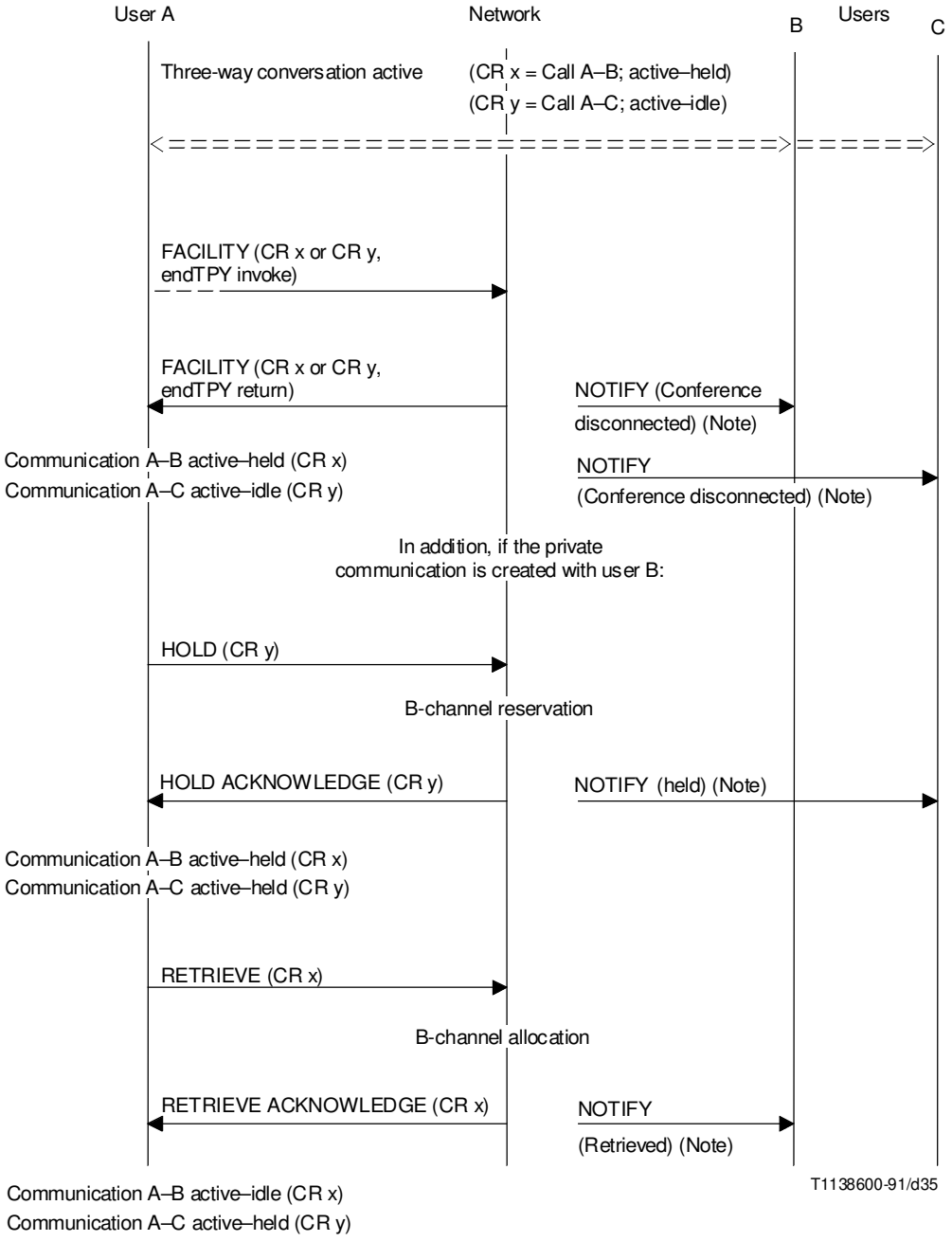


FIGURE 2-3/Q.954

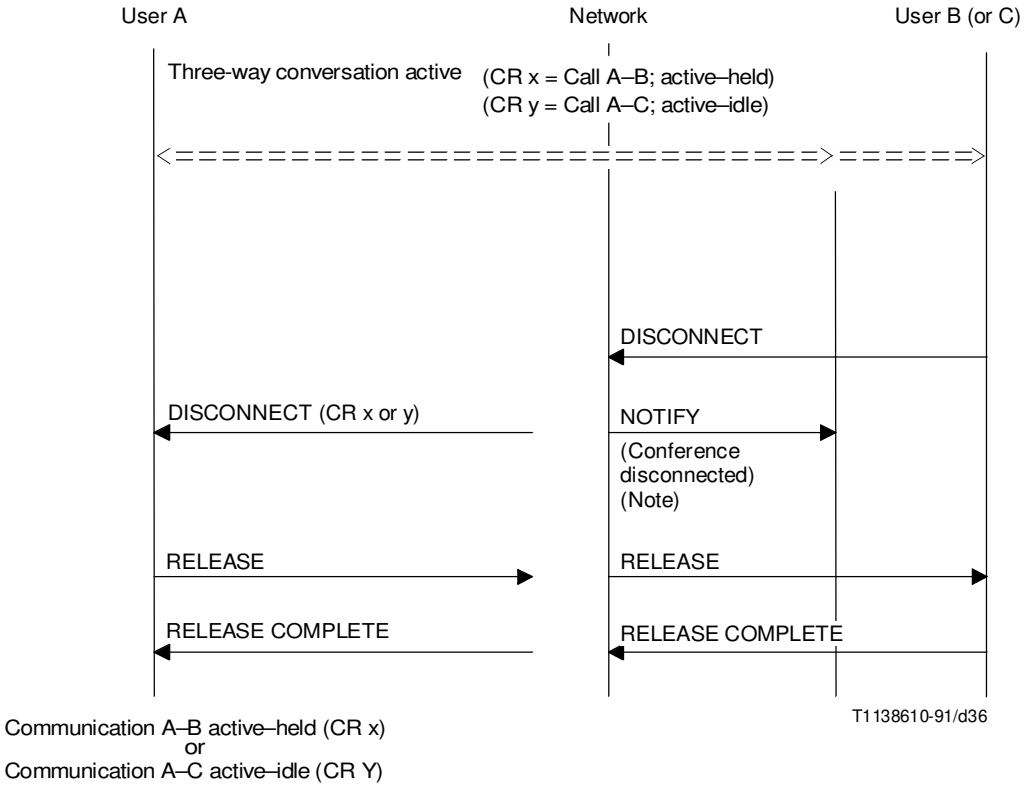
User A requests to terminate the three-way conversation



NOTE – The sending of notification is optional.

FIGURE 2-4/Q.954

User A request to create a private communication with one of the parties



NOTE – The sending of notification is optional.

FIGURE 2-5/Q.954

User B (or C) request to release it from the three-way conversation

2.9 Parameter values

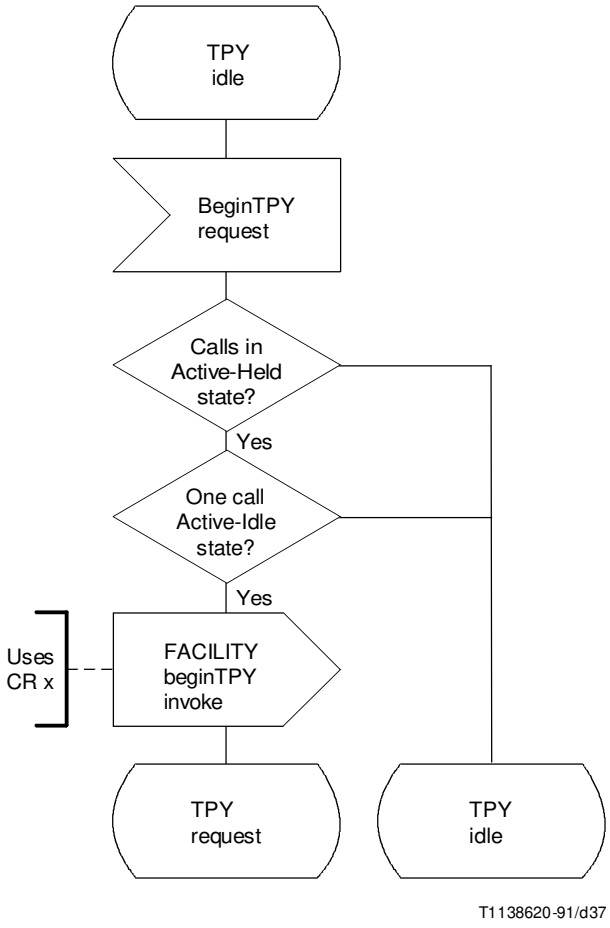
None identified.

2.10 Dynamic description

The dynamic descriptions are specified in Figures 2-6 and 2-7.

Figure 2-6 shows the user side SDLs.

Figure 2-7 shows the network side SDLs.



NOTE – Two basic calls are involved in the TPY:

– one Active-Held call: CR x; and
– one Active-Idle call: CR y.

FIGURE 2-6/Q.954 (sheet 1 of 4)

User side SDL

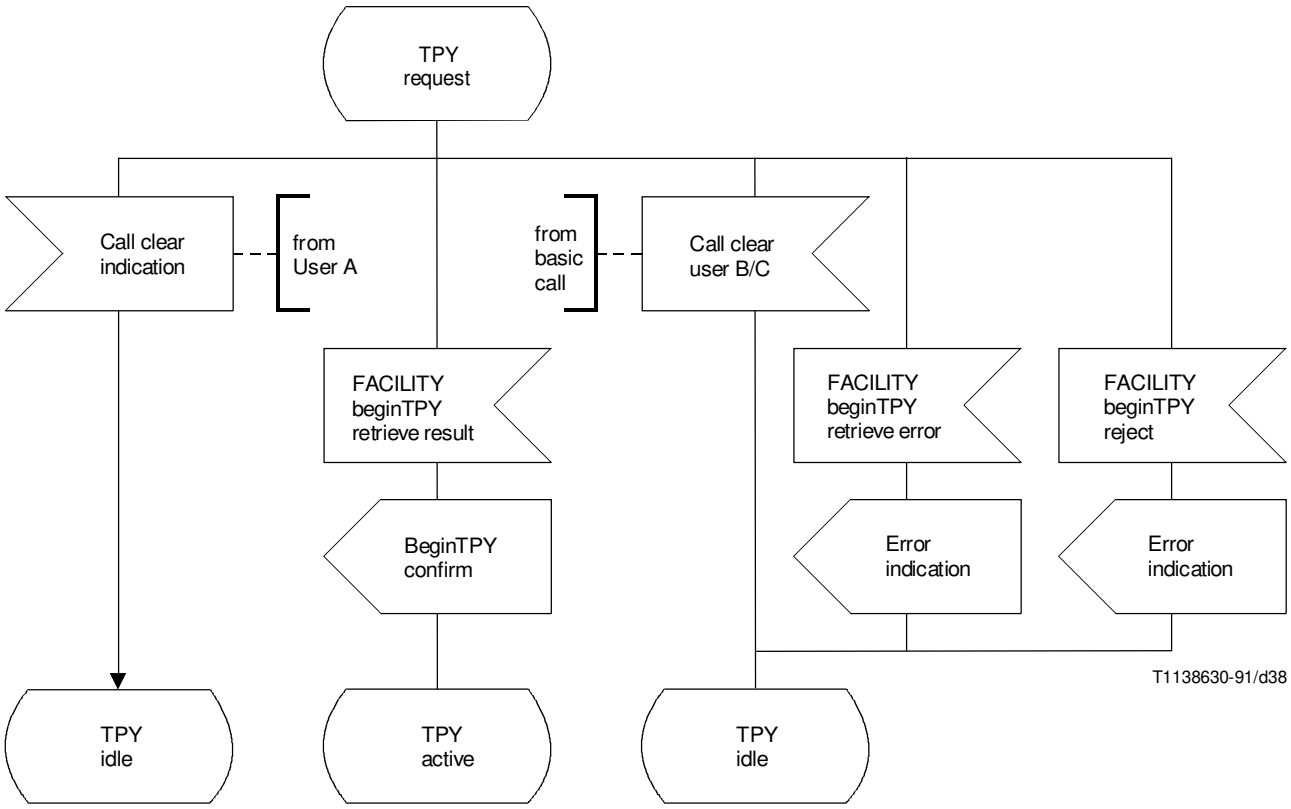


FIGURE 2-6/Q.954 (sheet 2 of 4)

User side SDL

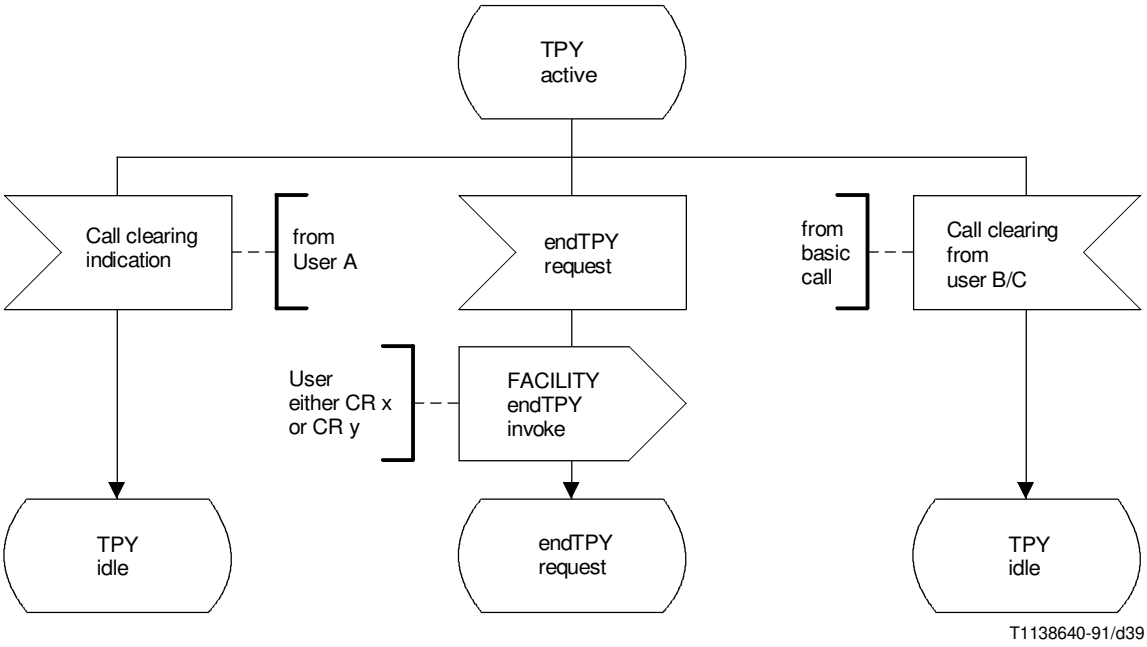


FIGURE 2-6/Q.954 (sheet 3 of 4)

User side SDL

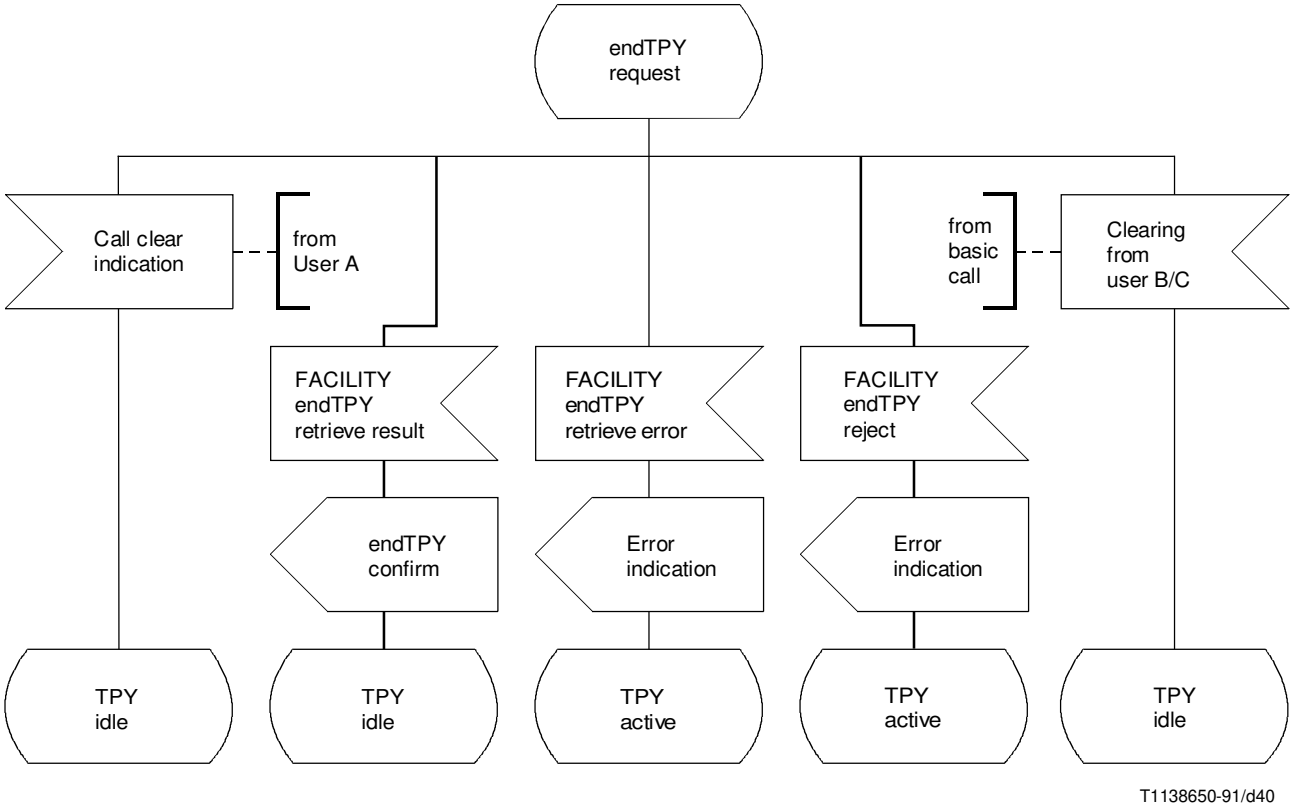
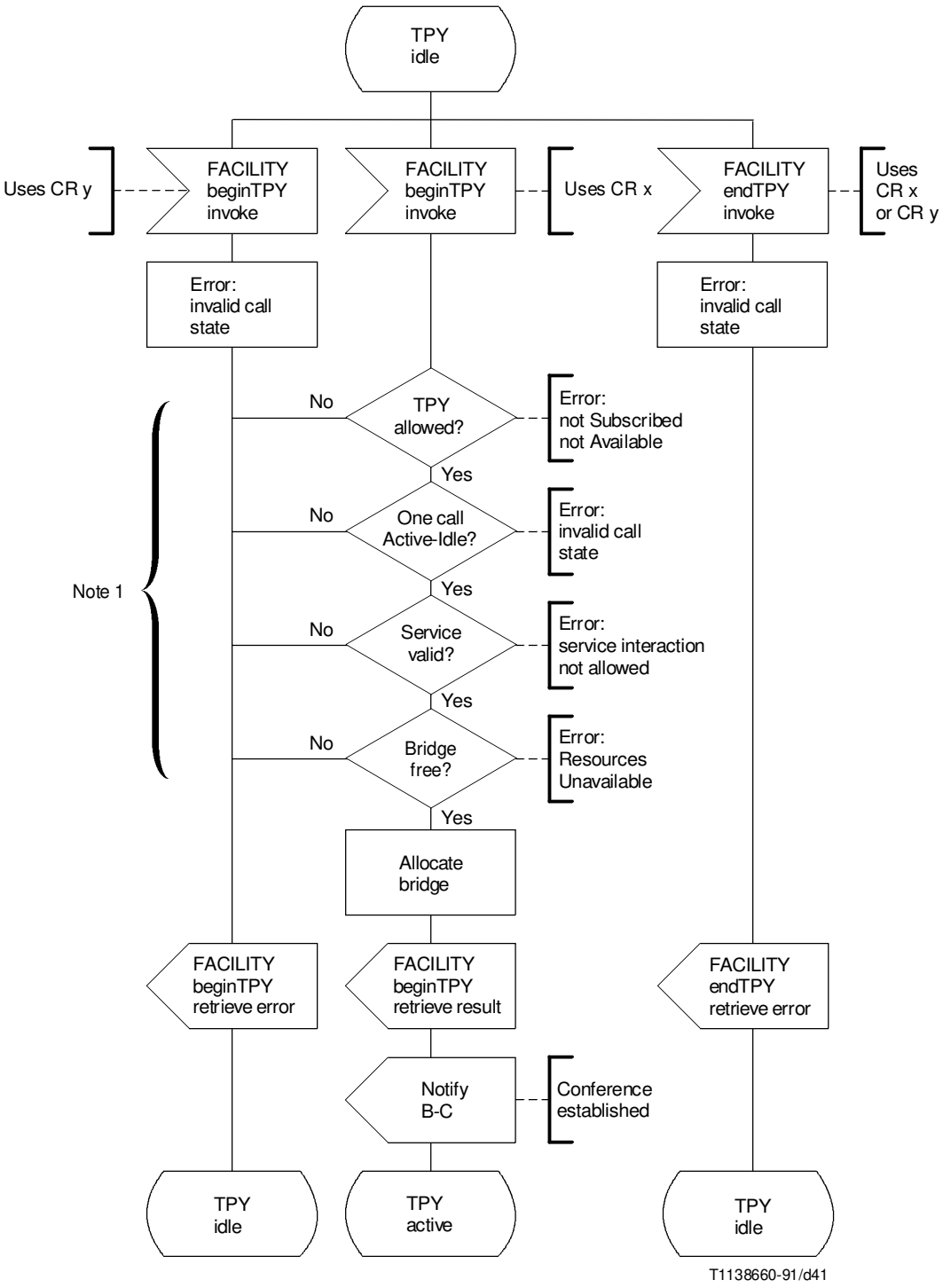


FIGURE 2-6/Q.954 (sheet 4 of 4)

User side SDL



NOTES

1 The order of these tests is implementation dependent.

2 Two basic calls are involved in the TPY:
– one Active-Held call: CR x; and
– one Active-Idle call: CR y.

FIGURE 2-7/Q.954 (sheet 1 of 2)

Network side SDL

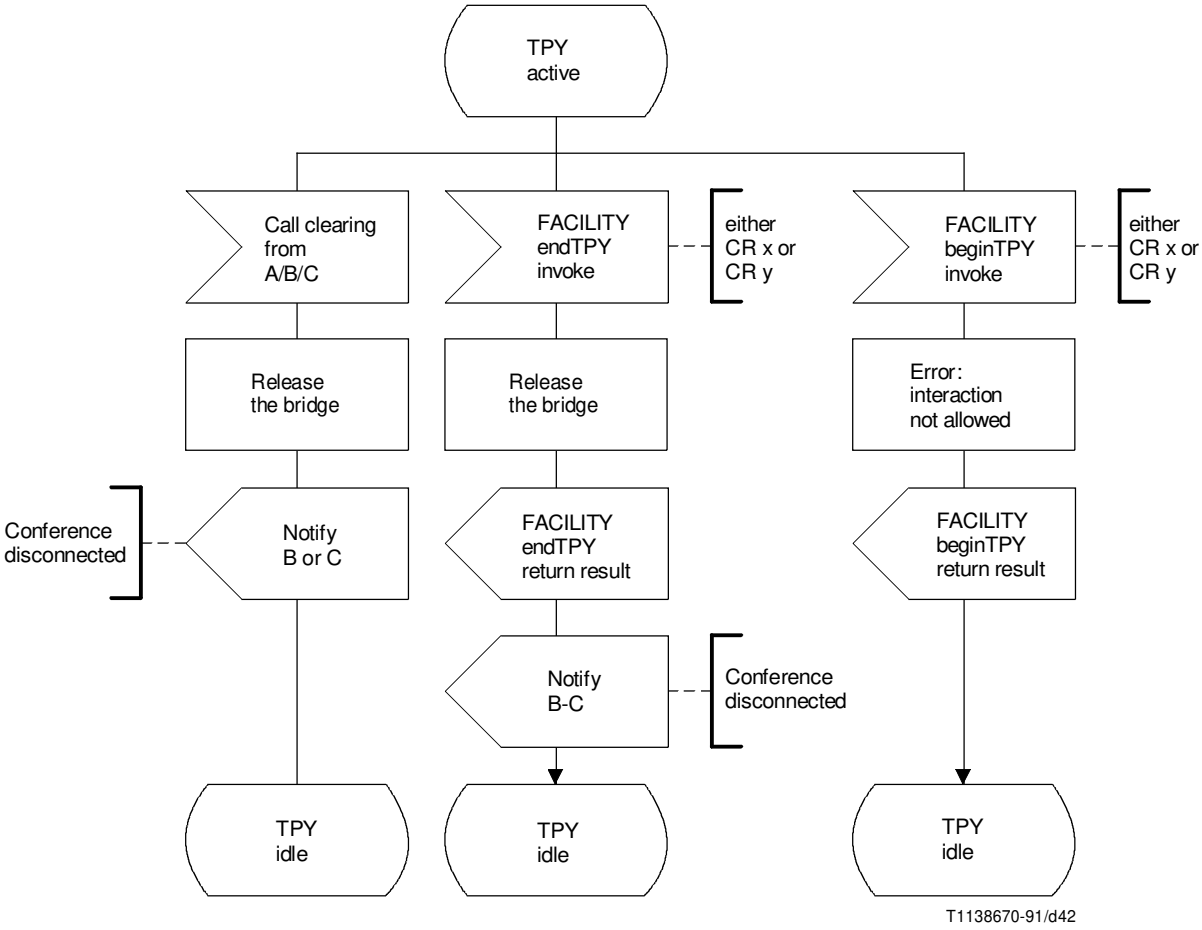


FIGURE 2-7/Q.954 (sheet 2 of 2)

Network side SDL

Appendix I

(referred to in clause 2)

Diagrammatic description of coding requirements

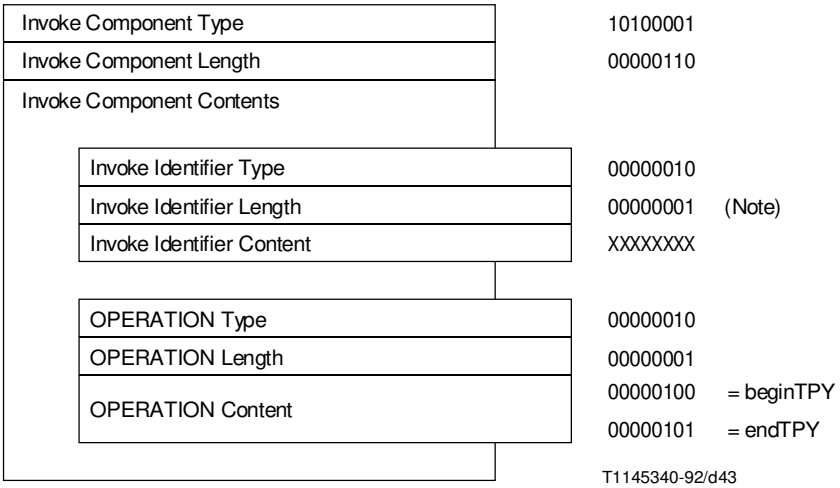
(This appendix does not form an integral part of this Recommendation)

Example component structures for the Three-Party supplementary service are shown in Figures I.1, I.2 and I.3.

In case of discrepancies between this appendix and 2.4.1, 2.4.1 is considered as the prime source.

I.1 Invoke components

See Figure I.1.



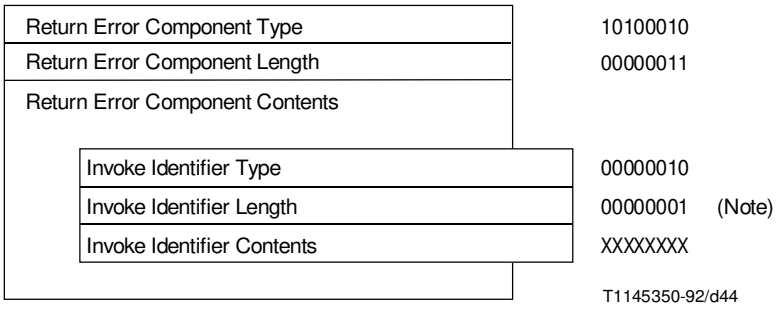
NOTE – The length of the invoke identifier is either 1 or 2 octets.

FIGURE I.1/Q.954

BeginTPY and endTPY invoke components

I.2 Return result components

See Figure I.2.



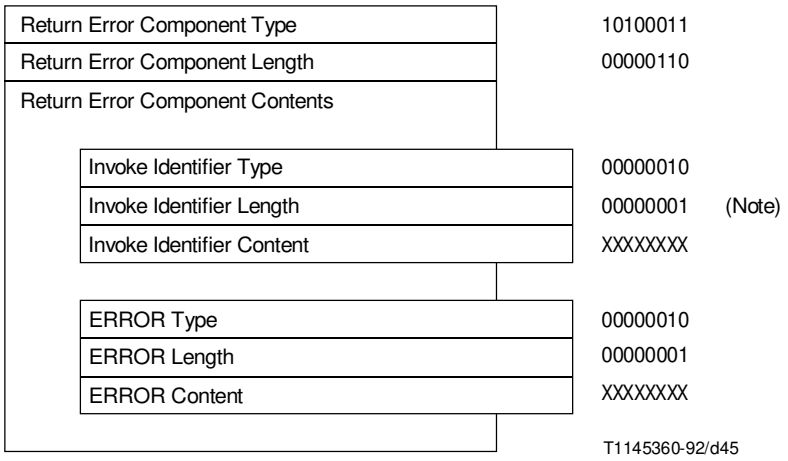
NOTE – The length of the invoke identifier is either 1 or 2 octets.

FIGURE I.2/Q.954

BeginTPY and endTPY return result components

I.3 Return error components

See Figure I.3.



NOTE – The length of the invoke identifier is either 1 or 2 octets.

FIGURE I.3/Q.954

BeginTPY and endTPY return error components

References

[1] CCITT Recommendation, *Generic procedures for the control of ISDN supplementary services*, Rec. Q.932, 1992.

[2] CCITT Recommendation *ISDN user-network interface layer 3 specification for basic call control*, Rec. Q.931,1992.

[3] CCITT Recommendation *ISDN 64 kbit/s circuit mode switched bearer services*, Rec. Q.71, 1988.

[4] CCITT Recommendation *Specification of abstract syntax notation one (ASN.1)*, Rec. X.208 1988.

[5] CCITT Recommendation *Remote operations: model, notation and service definition*, Rec. X.219, 1992.

[6] CCITT Recommendation *SDL specification description language*, Rec. Z.100, 1992.

[7] CCITT Recommendation *Stage 2 description for multiparty supplementary services*, Rec. Q.84, 1992.

[8] CCITT Recommendation *Stage 3 description for additional information transfer supplementary services using DSS 1*, Rec. Q.957, 1992.

[9] CCITT Recommendation *Stage 3 description for call completion supplementary services using DSS 1*, Rec. Q.953, 1992.

[10] CCITT Recommendation *Stage 3 description for community of interest supplementary services using DSS 1*, Rec. Q.955, 1992.