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History of Revised Versions

Version	Date	Outline
01	Dec. 17, 1996	Established
02	July 11, 1997	Appendix A.3 is added.
03	Dec. 19, 1997	Note on en-bloc sending procedure and overlap sending procedure is added to 3.2.1 (2) and their related examples of sequence are added or changed.
04	June 7, 2000	Changed all WLL into FWA. Description about ISDN is added. Clause 4 is deleted.

C-NW1.00-04-TS

PHS-FWA System :
System Configuration of PHS-FWA System

Contents

1. Conditions of Network Configuration

1.1 Network Configuration

Figure 1-1 shows the PHS-FWA Network Configuration integrated with PSTN, ISDN and leased line. WRS is omitted in the figure of following section.

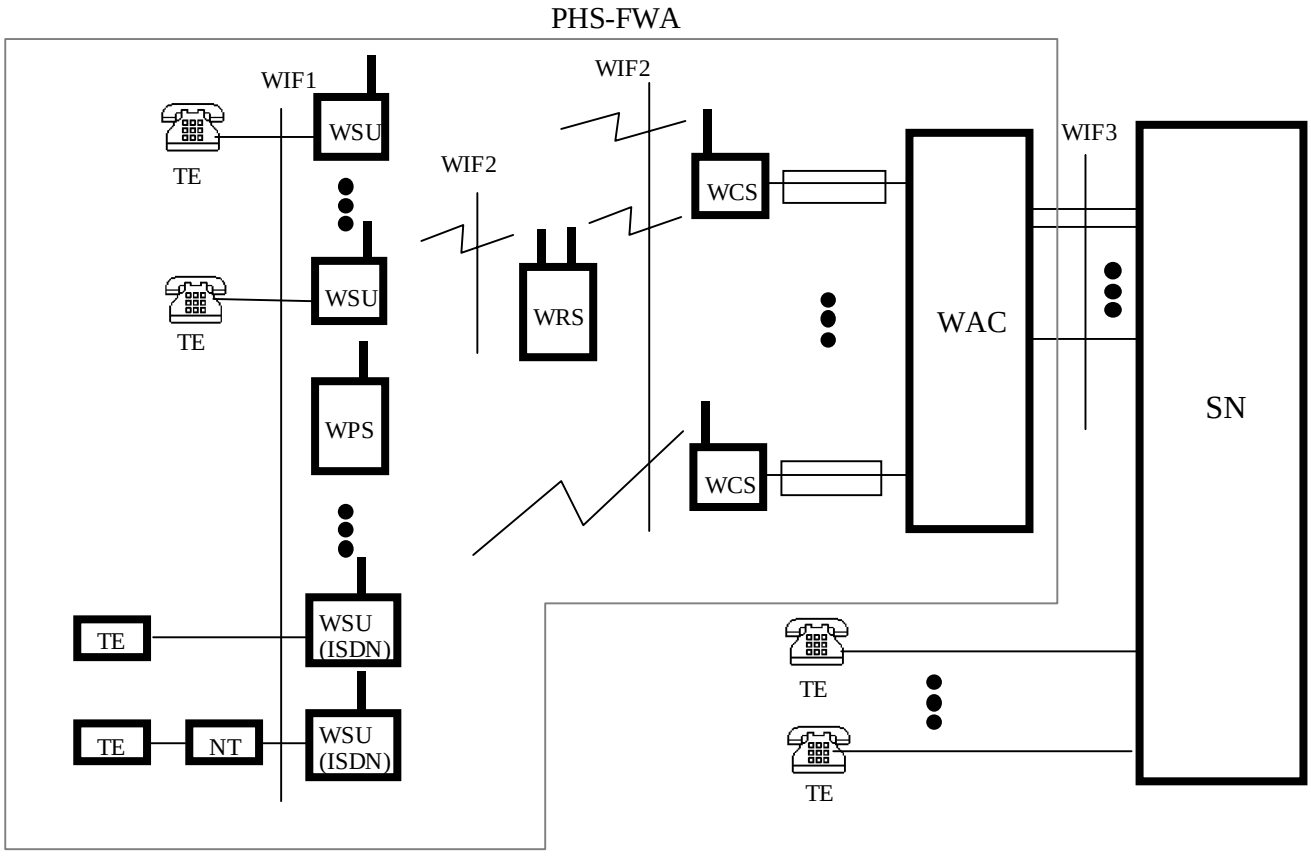


Figure 1-1/C-NW1.00 PHS-FWA Network Configuration

The service node (SN) is an existing Local Exchange of PSTN, ISDN and leased line.
Table 1-1/C-NW1.00 shows the outline of functions of each element.

Table 1-1/C-NW1.00 : Outline of functions of the PHS-FWA network elements

Item	Symbol	Outline of Functions
Service node	SN	SN which corresponds to the Local Exchange accommodates subscribers and processes originating / terminating calls.
FWA Access Controller	WAC	WAC accommodates WCSs for the PHS-FWA service and processes originating / terminating calls via the WCS ,WSU and WPS.
FWA Cell Station	WCS	WCS has the base station function of terminating the radio section for the PHS-FWA service.
FWA Personal Station	WPS	WPS is the user terminal for the PHS-FWA service which has the radio transmission function for up link/down link with WCSs and WPSs.
FWA Subscriber Unit	WSU	WSU is the subscriber unit which terminate user terminal for the PHS-FWA service ,and which has the radio transmission function for up link/down link with WCSs and WPSs.
FWA Repeater Station	WRS	WRS is the repeater station which repeats the radio interface of PHS-FWA system.

1.2 Reference points for PHS-FWA specific interfaces

Figure 1-1/C-NW1.00 defines the interface reference points in the PHS-FWA integrated with PSTN, ISDN and leased line.

For the present version, WIF1, WIF2, and WIF3 are defined in C-IF series documents.

2. Condition for Functions

2.1 Functions Required for PHS-FWA Network

The functions required for PHS-FWA network are shown in Table 2-1/C-NW1.00.

Table 2-1/C-NW1.00: Functions Required for PHS-FWA Network

Item No.	Function	Description
N-1	WCS Connection	Function to physically connect between network and WCS
N-2	Line Connection Control	Function to connect a line between a WCS accommodating WSU (WPS) s and WSU (WPS) communicating user
N-3	Paging	Function to notify idle WSUs (WPSs) s that a service has been activated
N-4	Call Control Function	Function to call control between SN and WSU (WPS)
N-5	Location Registration	Function for registration of the associated relationships between the telephone number assigned to a WSU (WPS) and the connection point for routing an incoming call
N-6	Location Information Control	Function for control of the associated relationships between the telephone number assigned to the WSU (WPS) registered by the location registration function and the connection point
N-7	Authentication	Function to enable either or both of a WSU (WPS) identified by a telephone number and the network to check for the validity of the WSU (WPS)
N-8	Authentication Information Control	Function to control information required for the authentication function
N-9	Supplementary Service Function	Function to provide supplementary services
N-10	SN Interface	Function to interface the service node (ex. 2W Analogue or V5.2 interface, G.961 and so on.)
N-11	Information Transfer	Function to transfer information between the network elements
N-12	Operator Identification	Function to identify the operator associated with the telephone number assigned to a WSU (WPS)
N-13	Collect Dial Digit	Function to collect DP/DTMF dial signaling
N-14	On hook/Off hook Detect Function	Function to detect on hook and off hook signal
N-15	Hooking Detect Function	Function to detect hooking signal
N-16	Howling Function	Function to detect howling condition and to make howler tone
N-17	Ringing Tone Generate	Function to make ringing tone pattern which is defined by service specification
N-18	Battery Back-Up	Function to backup power feeding by battery

2.2 Functions Required for Air Interface

The functions required for the wireless system in Table 2-2/C-NW1.00.

Table 2-2/C-NW1.00: Functions Required for Air Interface

Item No.	Function	Description
R-1	Voice Coding	Function to code Voice (analogue signals) into digital signals or integrate the coded digital signals
R-2	Wireless Access	Function to configure many communications channels through use of a given frequency band and gain access to one of the communications channels
R-3	Interference Detection Function	Function to let a WCS or WSU (WPS) attempting to start communications search for an idle channel and communicate by itself
R-4	Interference Avoidance Function	Function to monitor the condition of interference by another WSU (WPS), and if an interference occurs, avert the interference by automatically changing channels
R-5	User Scrambling	Function to perform scramble processing of the original signals to prevent tapping

3. Network Function Allocation

3.1 PHS-FWA Elements and Function Allocation

Figure 3-1/C-NW1.00 shows the network elements and the function allocation in PHS-FWA network. PHS-FWA network is composed of radio access network elements such as WAC/WCS, WSU and WPS. A typical function allocation using this network configuration is described below.

3.1.1 FWA Access Controller (WAC) and FWA Cell Station (WCS)

WAC/WCS has the function to control network services for PSTN, ISDN and leased line. WAC controls location registration information, authentication information, and various supplementary services. WCS controls radio interface. WCS has the radio interface with FWA subscriber unit (WSU) and FWA personal station (WPS). The radio interface includes interference detection and avoidance functions.

3.1.2 FWA Subscriber Unit (WSU)

WSU is a subscriber unit which consists of radio equipment made up of antenna, transmitter, receiver and so on, and interface to TE or NT.

3.1.3 Terminal Equipment (TE)

In the case of PSTN, TE is an existing analogue telephone. TE may support CLIP (Calling Line Identification Presentation) functionality.
In the case of ISDN, TE is ISDN terminal equipment (ISDN TE).

3.1.4 FWA Personal Station (WPS)

WPS is a user terminal that has the radio interface with WCS.

3.1.5 Service Node (SN)

In this document, Service Node (SN) is same as a Local Exchange (LE) for Public Switch Telephone Network or Integrated Service Digital Network. SN accommodates subscribers and processes originating / terminating calls.

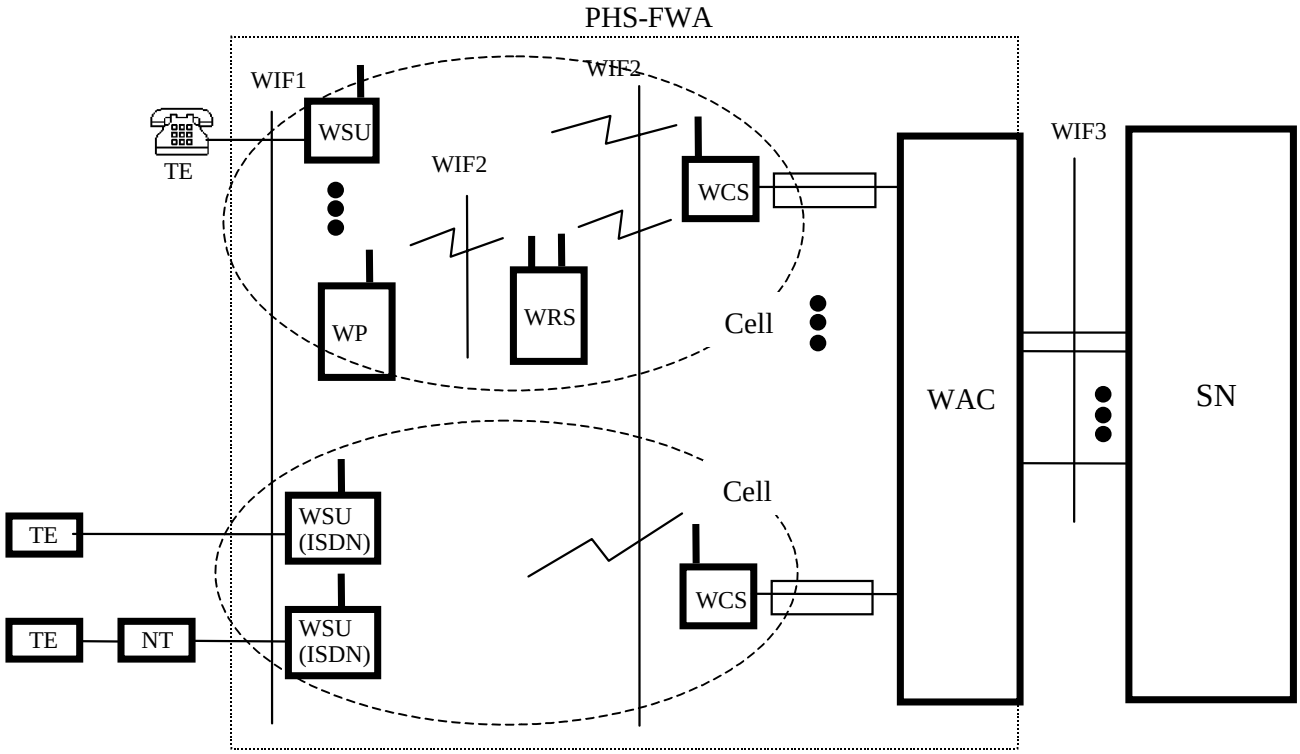
3.1.6 Location Registration Area

Location registration area is composed of one or more cell zones. When WSU or WPS has located to the location registration area (ex. Power ON etc.), the location registration procedure is activated. The registration information is updated in WAC.

Location registration procedure is optional function of PHS-FWA.

3.1.7 Cell

Cell is the area where WSU and/or WPS can receive the radio wave from a WCS. Interference avoidance procedure is activated when WSU and WPS detect some interference.



Network Element	Functions	
WAC	N-1. WCS connection	N-7. Authentication
	N-2. Line Connection Control	N-8. Authentication Information Control
	N-5. Location Registration	N-9. Supplementary Service Function
	N-6. Location Information Control	N-10. SN Interface
WCS	R-2. Wireless Access	R-4. Interference Avoidance Function
	R-3. Interference Detection Function	R-5. User Scrambling
WAC or WCS or both	N-3. Paging	N-13. Operator Identification
	N-4. Call Control Function	N-18. Battery Back-Up
	N-11. Information Transfer	
Service Node (SN)	N-4. Call Control Function	N-14. On hook/Off hook Detection Function
	N-9. Supplementary Service Function	N-15. hooking Detect Function
	N-11. Information Transfer	N-16. Howling Function
	N-13. Collect Dial Digit	N-17. Ringing Tone Generation
WSU	N-4. Call Control Function	R-1. Voice Coding
	N-13. Collect Dial Digit	R-2. Wireless Access
	N-14. ON-Hook/OFF-Hook Detection Function	R-3. Interference Detection Function
	N-15. Hooking Detect Function	R-4. Interference Averting Function
	N-16. Howling Function	R-5. User Scrambling
	N-17. Ringing Tone Generation	
	N-18. Battery Back-Up	
WPS	N-4. Call Control Function	R-3. Interference Detection Function
	R-1. Voice Coding	R-4. Interference Avoidance Function
	R-2. Wireless Access	R-5. User Scrambling
WRS	N-4. Call Control Function	R-3. Interference Detection Function
	R-2. Wireless Access	R-4. Interference Avoidance Function
	N-18. Battery Back-Up	R-5. User Scrambling

Figure 3-1/C-NW1.00 Network Element and Function Allocation

3.2 Location Registration Procedure

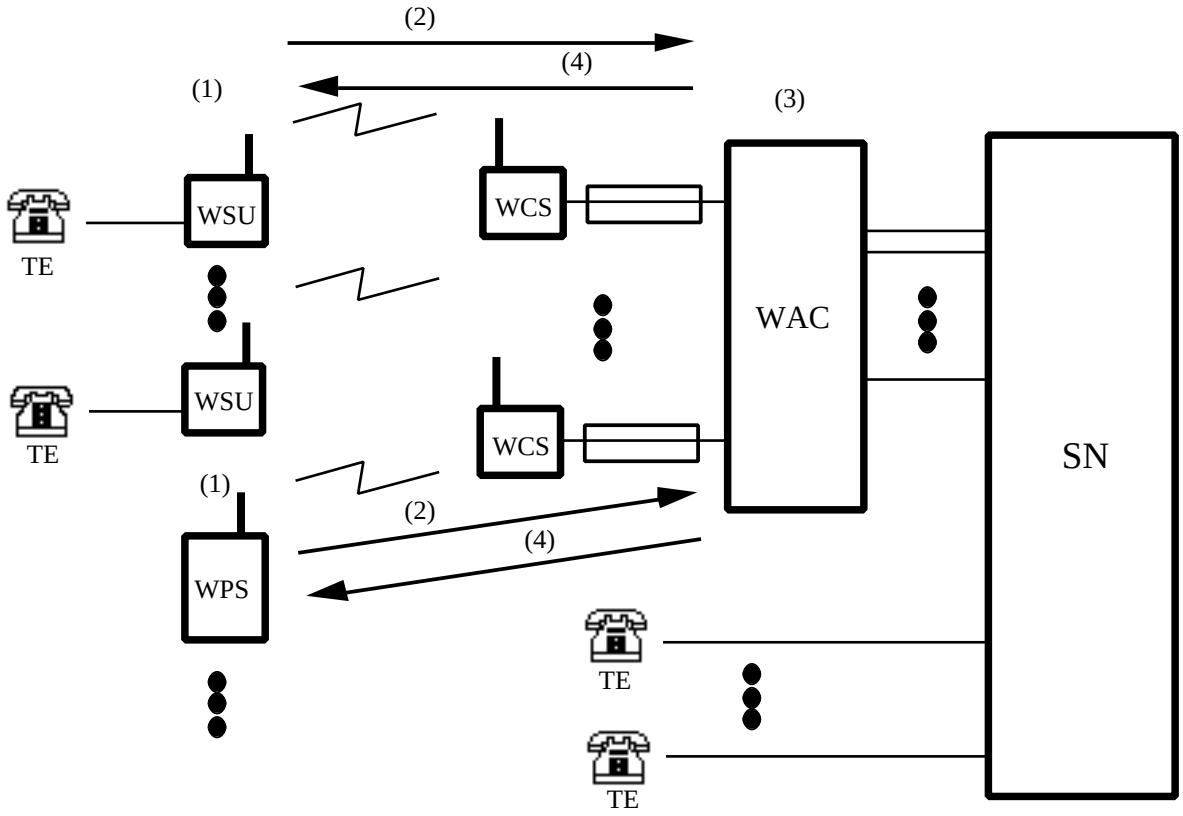
Location registration function includes holding location information of WSU (WPS) and updating the location information. "Area Number" is used as location information. The purpose of the location registration is to inform the location information to database in WAC when WSU (WPS) is located to the location registration area. Figure 3-2/C-NW1.00 shows an example of location registration procedure.

(1) WSU (WPS) recognizes the present location registration area by information from WCS.

(2) When WSU recognizes a new location registration area, WSU transmits the location registration request message to WAC after the authentication procedure is executed.

(3) The location information in WAC is updated.

(4) WAC sends the complete message of the location registration is transferred to WSU (WPS) through WCS.



(1) WSU(WPS) recognizes the present location registration area by information from WCS.
(2) When WSU recognizes a new location registration area, WSU transmits the location registration request message to WAC after the authentication procedure is executed.
(3) The location information in WAC is updated.
(4) WAC sends the complete message of the location registration is transferred to WSU(WPS) through WCS.

Figure 3-2/C-NW1.00 Location Registration Procedure

3.3 Authentication Procedure

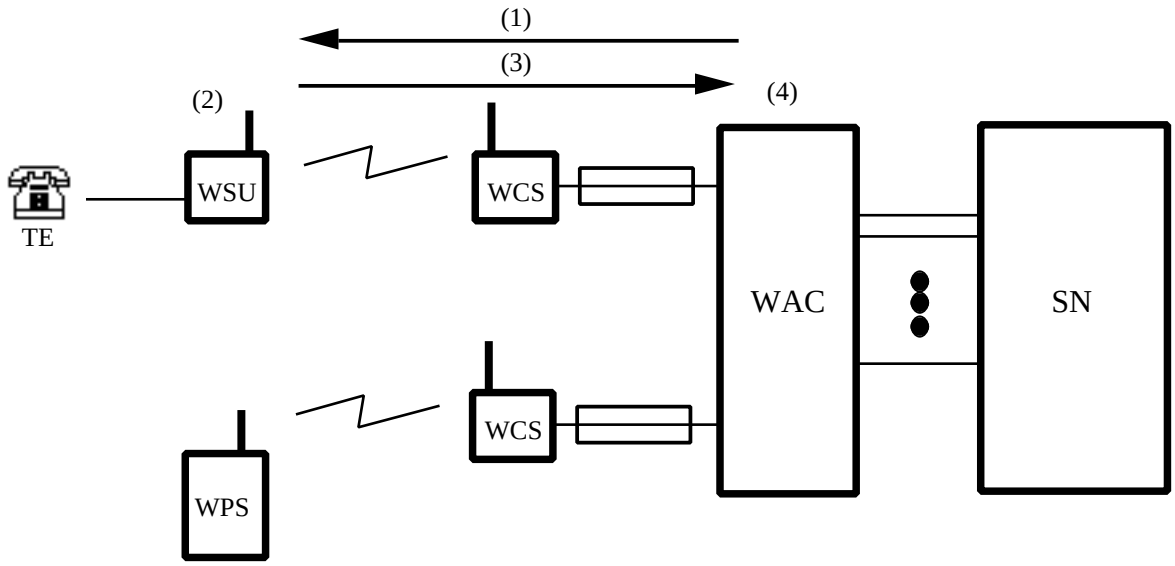
When the necessary function request declared by the user ends, the WAC proceeds the authentication procedure based on RCR standard STD-28.. Figure 3-3/C-NW1.00 shows an example of authentication procedure.

(1) WAC/WCS sends authentication request to WSU (WPS).

(2) WSU (WPS) performs calculation by using an authentication algorithm.

(3) WSU (WPS) sends the authentication response to WAC/WCS.

(4) WAC/WCS verifies the result and permits WSU (WPS) to communicate with SN.



(1) WAC/WCS sends authentication request to WSU(WPS).
(2) WSU(WPS) performs calculation by using an authentication algorithm.
(3) WSU(WPS) sends the authentication response to WAC/WCS.
(4) WAC/WCS verifies the result and permits WSU(WPS) to communicate with SN.

Figure 3-3/C-NW1.00 Authentication Procedure

3.4 Interference Avoidance Procedure

The WCS and WSU (WPS) perform continuous line monitoring after a service channel established. When WCS or WSU (WPS) detects some interfering condition in the using service channel, interference avoidance procedure based on STD-28 is performed.

Figure 3-4/C-NW1.00 shows an example of channel switching procedure which averts interference.

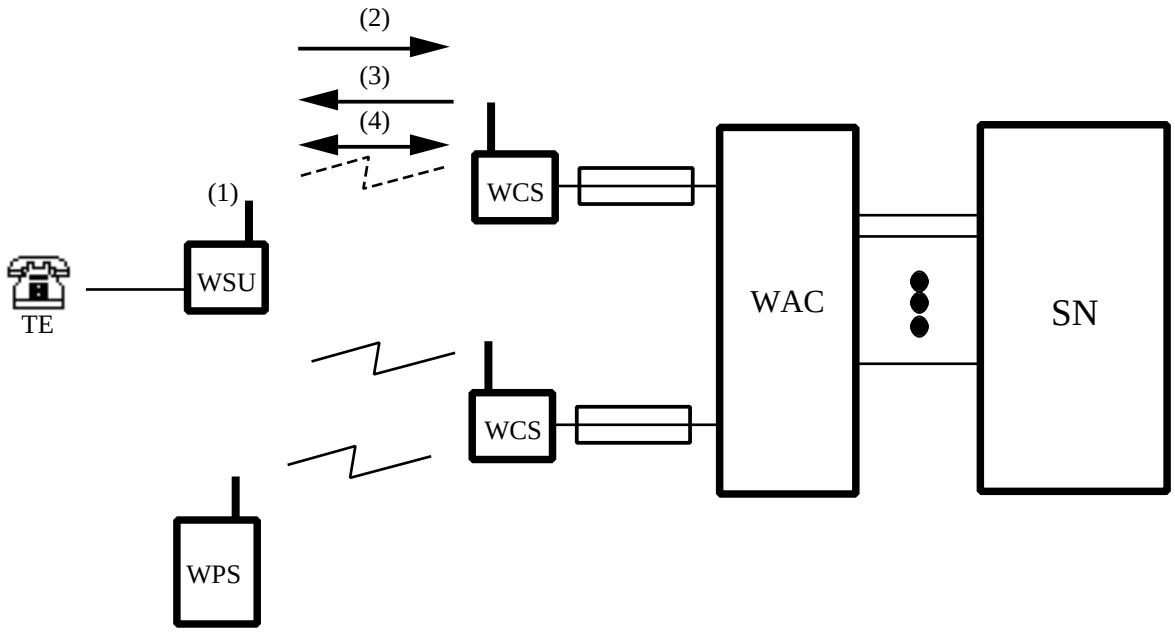
(1) WSU (WPS) recognizes that the quality of the service channel becomes error condition.

(2) WSU (WPS) sends TCH switching request to WCS. (NOTE1)

(3) WCS sends TCH switching indication to WSU (WPS).

(4) WCS and WSU (WPS) start to change channel, and new channel are established.

NOTE1: Unnecessary in case of WCS activation.



(1) WSU(WPS) recognizes that the quality of the service channel becomes error condition.
(2) WSU(WPS) sends TCH switching request to WCS. (NOTE1)
(3) WCS sends TCH switching indication to WSU(WPS).
(4) WCS and WSU(WPS) start to change channel, and new channel are established.

Figure 3-4/C-NW1.00 TCH Switching Procedure

3.5 PSTN procedure

3.5.1 Call Connection Procedure

3.5.1.1 Originating Call

The general flow of originating call connection is shown in Figure 3-5/C-NW1.00.

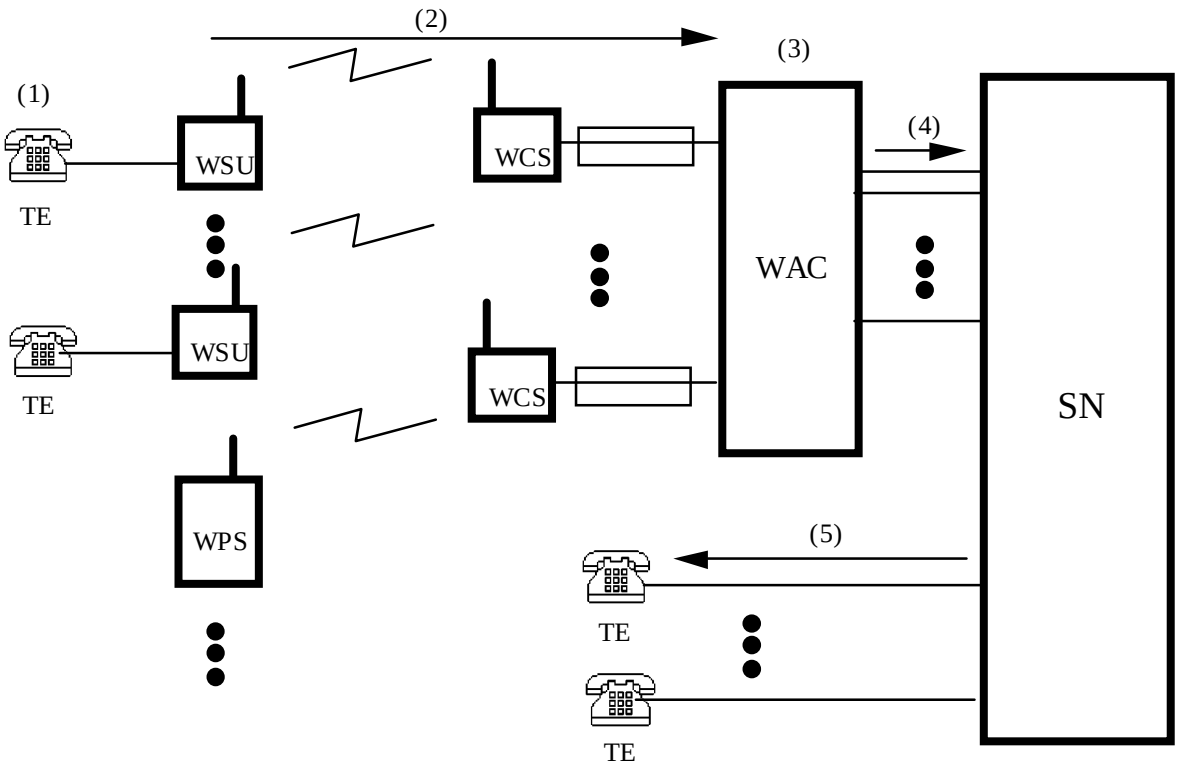
(1) Subscriber dials PSTN number at originating terminal.

(2) Setup message is transferred to WAC. (NOTE1)

(3) The authentication procedure is executed in WAC.

(4) WAC performs the originating procedure to the PSTN.

(5) The connection path is established to the terminating terminal.



(1) Subscriber dials PSTN number at originating terminal.
(2) Setup message is transferred to WAC.
(3) The authentication procedure is executed in WAC.
(4) WAC performs the originating procedure to the PSTN.
(5) The connection path is established to the terminating terminal.

Figure 3-5/C-NW1.00 Call Connection Procedure (Originating Call)

NOTE1:

There are four cases described as following.
Bilateral agreement about procedure is necessary between WSU and WCS+WAC.

case1 : En-bloc sending procedure
case2 : Overlap sending procedure

In case of the case 1, WSU once accumulates all dial digits from TE. Then WSU will send Setup message based on the en-bloc sending procedure, and WAC will send dial digits to SN one by one. So it takes more long delay time than case2.

The case2 includes following types.

Type1 : Using inband DTMF, after en-bloc sending procedure on WIF2.
Type2 : Overlap sending procedure, using inband DT from SN.
Type3 : Overlap sending procedure, using DT generated locally in WSU.

Type1 : Using inband DTMF, after en-bloc sending procedure on WIF2

When WSU detects off hook condition, WSU initiates the en-bloc sending procedure on WIF2 and connects a pass from WSU to SN. Dial tone is transmitted to TE from SN. Then TE transmits the dial signal which used DTMF signal. This DTMF signal is sent to the SN through the established path.

Type2 : Overlap sending procedure, using inband DT from SN

When WSU detects off hook condition, WSU initiates the overlap sending procedure and connects a pass from WSU to SN. Dial tone is transmitted to TE from SN. Then TE transmits the dial signal which is received by WSU. WSU sends additional dial information to SN, using overlap sending procedure.

Type3 : Overlap sending procedure, using DT generated locally in WSU

When WSU detects off hook condition, WSU generates DT locally. Then TE transmits the dial signal which is received by WSU. WSU initiates the overlap sending procedure.

Table 3-1/C-NW1.00 Comparison of each procedures

Item		case1	case2		
			Type1	Type2	Type3
Delay time	Off-hook ~ DT	S	M	M	S
	Dial ~ Alerting	L	S	S	S
TE	DTMF dialing	X	X	X	X
	DP dialing	X	NA	X	X

L : Long M ; Medium S: short X : Applicable NA : Not applicable

3.5.1.2 Terminating Call

The general flow of terminating call connection is shown in Figure 3-6/C-NW1.00.

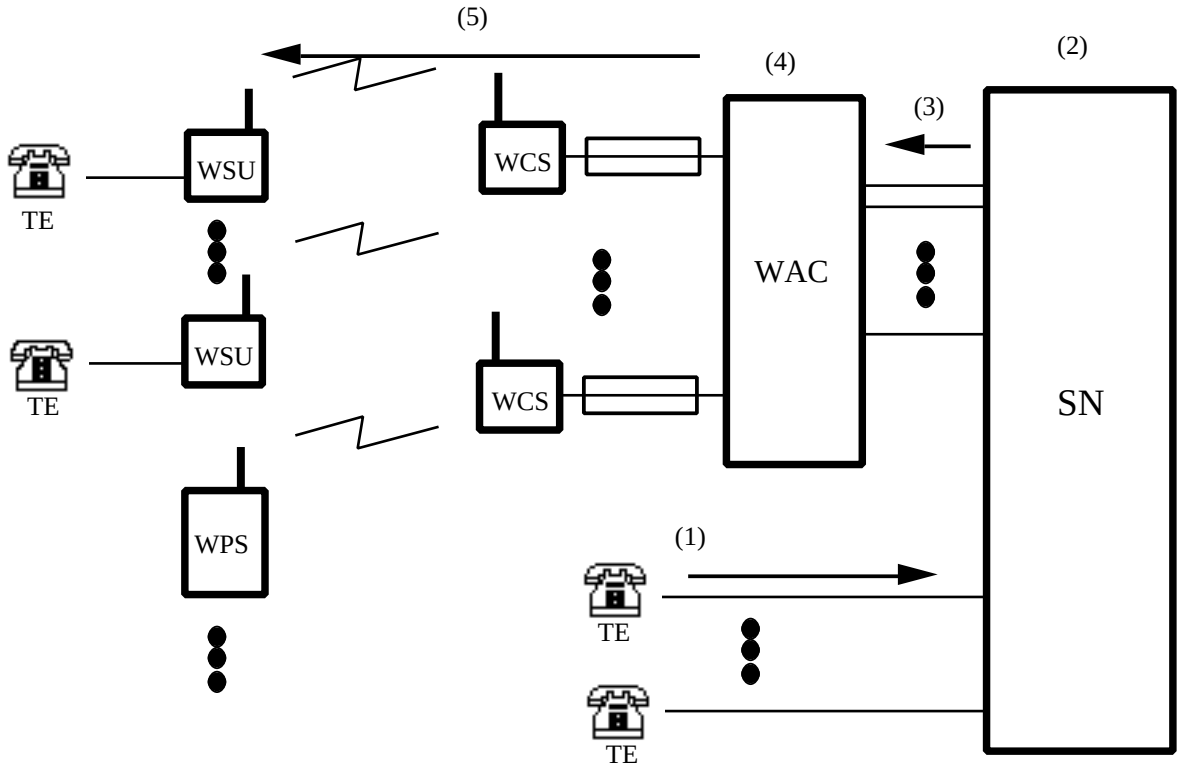
(1) Subscriber dials PSTN number at originating terminal which is connected directly to the Local Exchange.

(2) Terminating Call Procedure is performed in SN.

(3) The connection is established to the terminating WAC.

(4) WAC selects appropriate WCS and pages the termination WSU (WPS).

(5) The authentication of the terminating WSU (WPS) is executed at WAC. The connection is established to the terminating terminal.



(1) Subscriber dials PSTN number at originating terminal which is connected directly to the Local Exchange.
(2) Terminating Call Procedure is performed in SN.
(3) The connection is established to the terminating WAC.
(4) WAC selects appropriate WCS and pages the termination WSU (WPS).
(5) The authentication of the terminating WSU(WPS) is executed at WAC. The connection is established to the terminating terminal.

Figure 3-6/C-NW1.00 Call Connection Procedure (Terminating Call)

3.5.2 Howler Tone Sending Procedure

When a call cleared by another terminal, WSU starts the supervisory timer which detects the on-hook condition of its telephone. If the supervisory timer is expired, WSU sends warning signal i.e. howler tone to the telephone. Figure 3-7/C-NW1.00 shows an example of howler tone sending procedure.

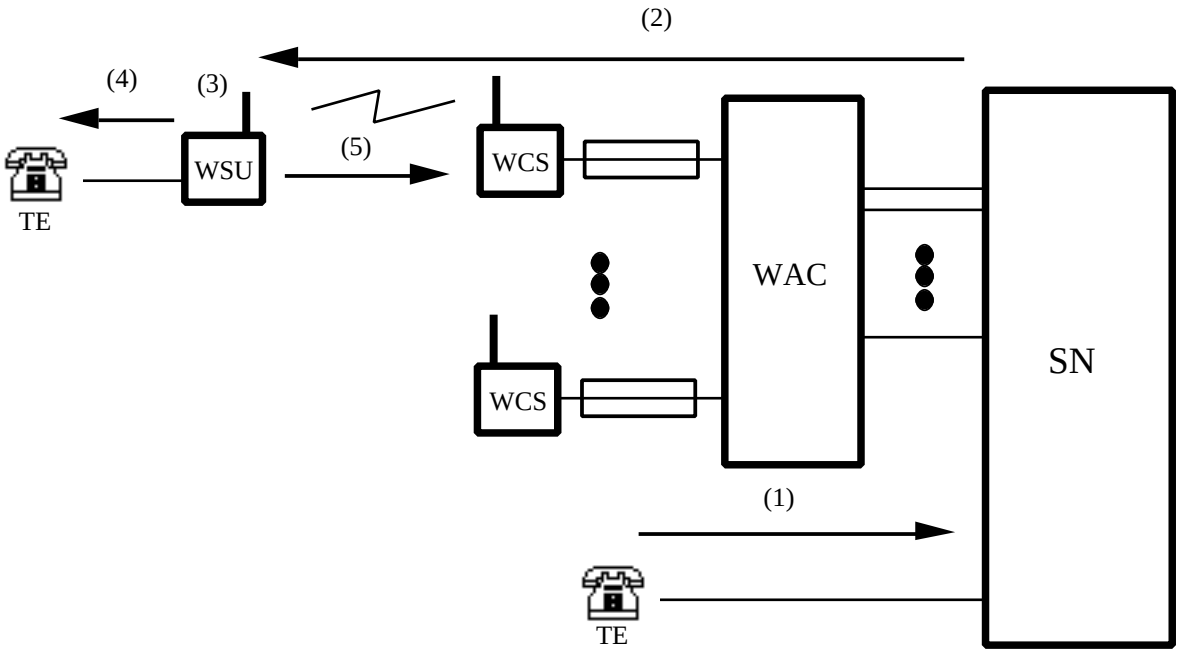
(1) A disconnect information is sent to SN from a telephone in the condition of connection in progress.

(2) SN sends the disconnect information is sent to WSU via WAC and WCS to proceed clear call procedure.

(3) WSU proceeds clear call procedure, and starts the supervisory timer which detect on-hook condition.

(4) If the supervisory timer is expired, WSU sends the howler tone to a telephone (TE).

(5) WSU proceeds the channel release procedure at the air interface.



(1) A disconnect information is sent to SN from a telephone in the condition of connection in progress.
(2) SN sends the disconnect information is sent to WSU via WAC and WCS to proceed clear call procedure.
(3) WSU proceeds clear call procedure, and starts the supervisory timer which detect on-hook condition.
(4) If the supervisory timer is expired, WSU sends the howler tone to a telephone(TE).
(5) WSU proceeds the channel release procedure at the air interface.

Figure 3-7/C-NW1.00 Howler Tone Sending Procedure

3.5.3 Hooking Signal Transmission Procedure

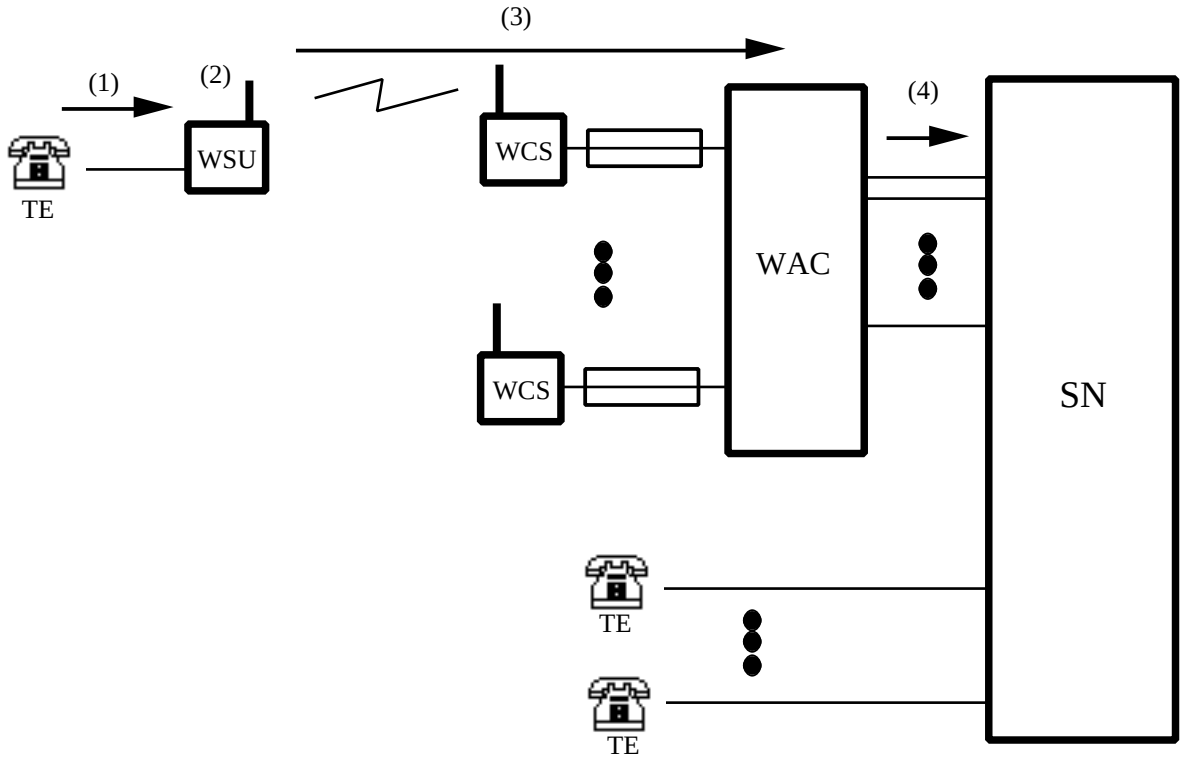
Hooking Signal (Hook-flash) is often used to invoke supplementary services. Figure 3-8/C-NW1.00 shows an example of hooking signal transmission procedure.

(1) The hooking signal is sent to WSU from a telephone in the condition of communication in progress.

(2) WSU converts the hooking signal to the air interface message based on STD-28.

(3) The hooking signal information is transmitted to WAC via WCS .

(4) WAC sends the hooking signal to SN.



(1) The hooking signal is sent to WSU from a telephone in the condition of communication in progress.
(2) WSU converts the hooking signal to the air interface message based on STD-28.
(3) The hooking signal information is transmitted to WAC via WCS .
(4) WAC sends the hooking signal to SN.

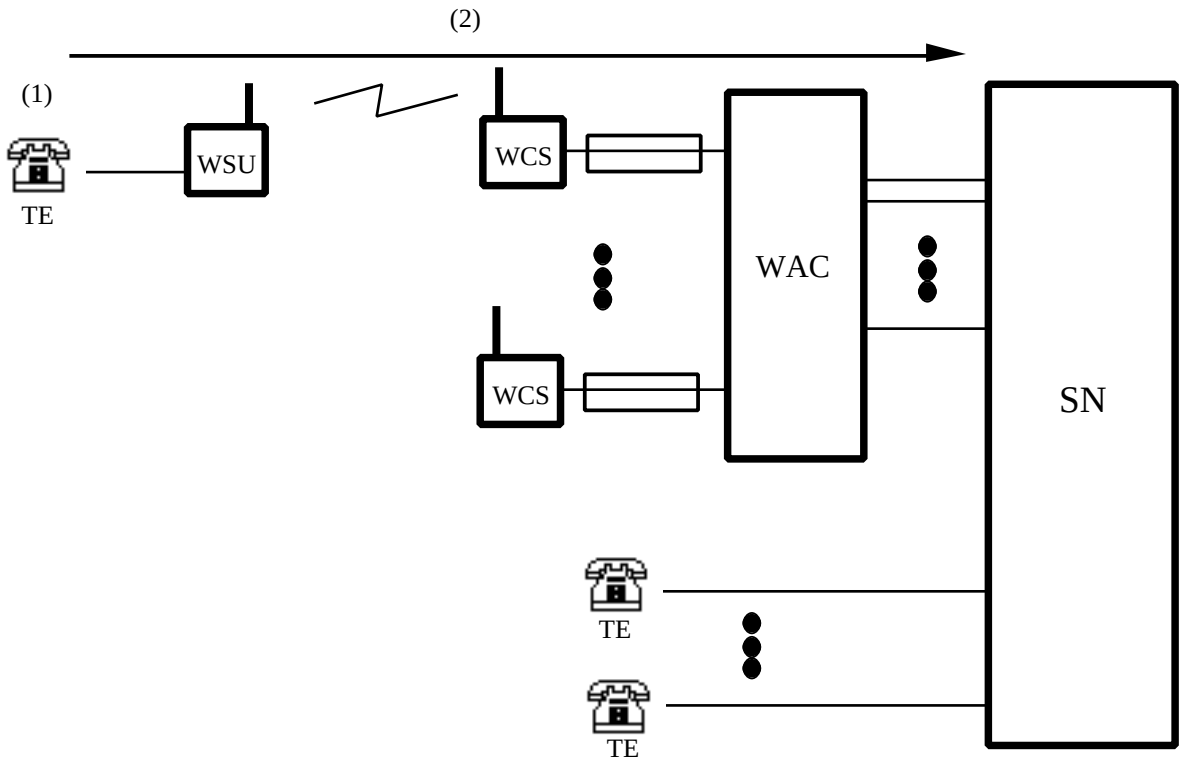
Figure 3-8/C-NW1.00 Hooking Signal Transmission Procedure

3.5.4 DTMF Signal Transmission Procedure

Figure 3-9/C-NW1.00 shows an example of DTMF signal transmission procedure.

(1) A telephone which connected to WSU generates DTMF signal in the condition of communication in progress.

(2) DTMF signal is transmitted to SN via communication channel.



(1) A telephone which connected to WSU generates DTMF signal in the condition of communication in progress.
(2) DTMF signal is transmitted to SN via communication channel .

Figure 3-9/C-NW1.00 DTMF Signal Transmission Procedure

3.5.5 Direct Dialing In

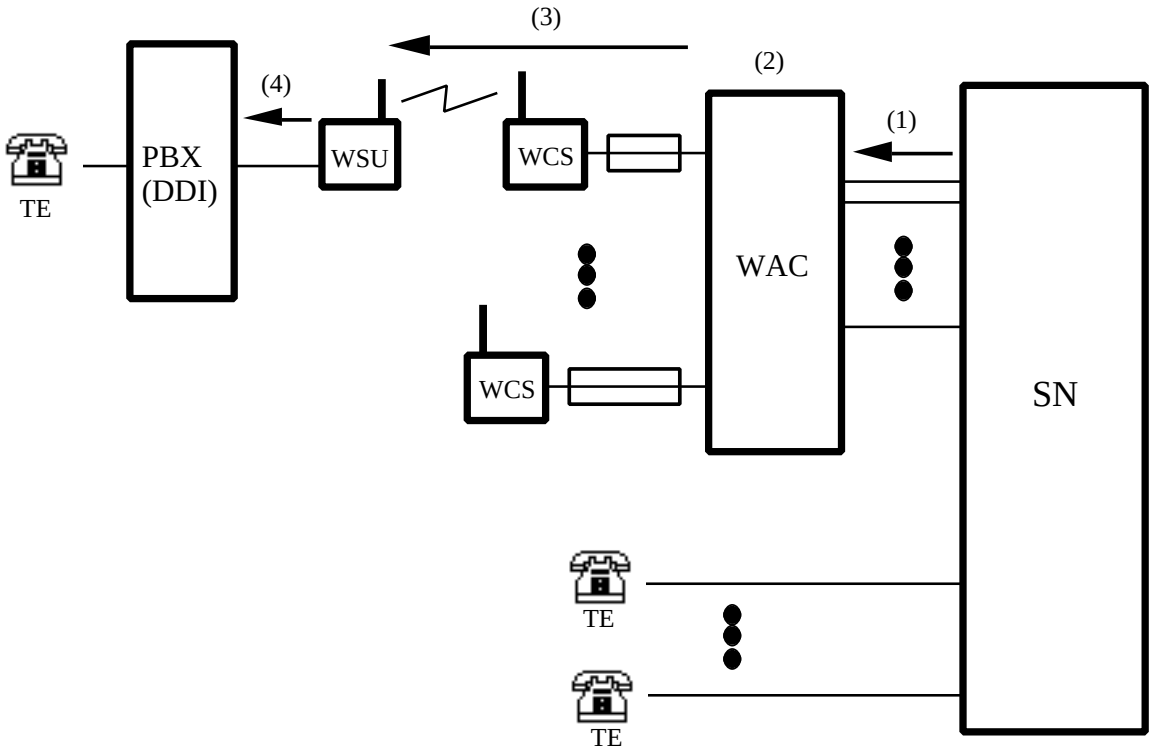
When a PBX using Direct Dialing In (DDI) service is connected to WSU, WAC and WSU should support DDI service.
Figure 3-10/C-NW1.00 shows the procedure of DDI.

(1) SN sends DDI dialing information to WAC by using DTMF signal.

(2) WAC collects the dial digits and mapping DDI number into called party number in a Setup message.

(3) WAC transmits a Setup message to WSU via WCS.

(4) WSU converts called party number information to DDI number dial digits, and sends DTMF dial digits to PBX .



(1) SN sends DDI dialing information to WAC by using DTMF signal.
(2) WAC collects the dial digits and mapping DDI number into called party number in a Setup message.
(3) WAC transmits a Setup message to WSU via WCS.
(4) WSU converts called party number information to DDI number dial digits, and sends DTMF dial digits to PBX .

Figure 3-10/C-NW1.00 Direct Dialing In

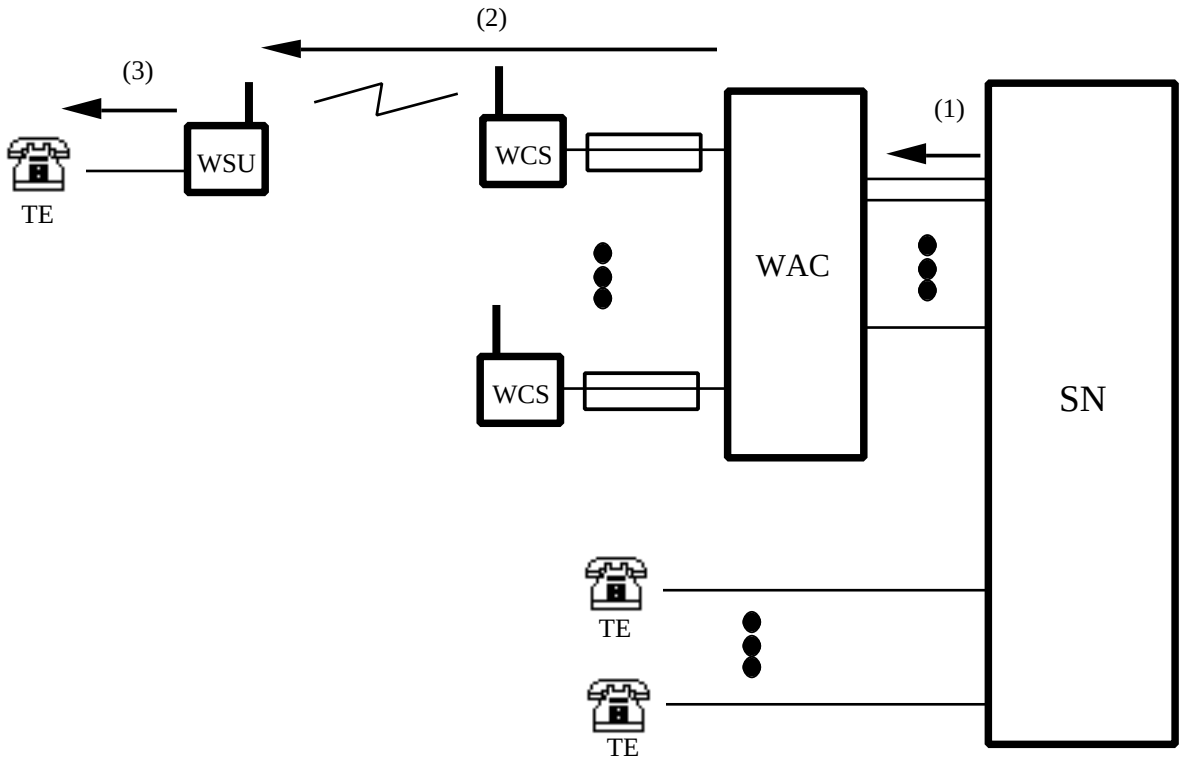
3.5.6 Calling Line Identification Presentation

Figure 3-11/C-NW1.00 shows an example of calling line identification presentation.

(1) The calling number information is sent to the WAC from SN using specific in-band signaling system.

(2) WAC detect the calling number information and puts in this information to SETUP message to WSU.

(3) WSU receives SETUP message from WCS, and sends the calling number information to TE using appropriate in-band signaling.



(1) The calling number information is sent to the WAC from SN using specific in-band signaling system.
(2) WAC detect the calling number information and puts in this information to SETUP message to WSU.
(3) WSU receives SETUP message from WCS, and sends the calling number information to TE using appropriate in-band signaling.

Figure 3-11/C-NW1.00 Calling Line Identification Presentation

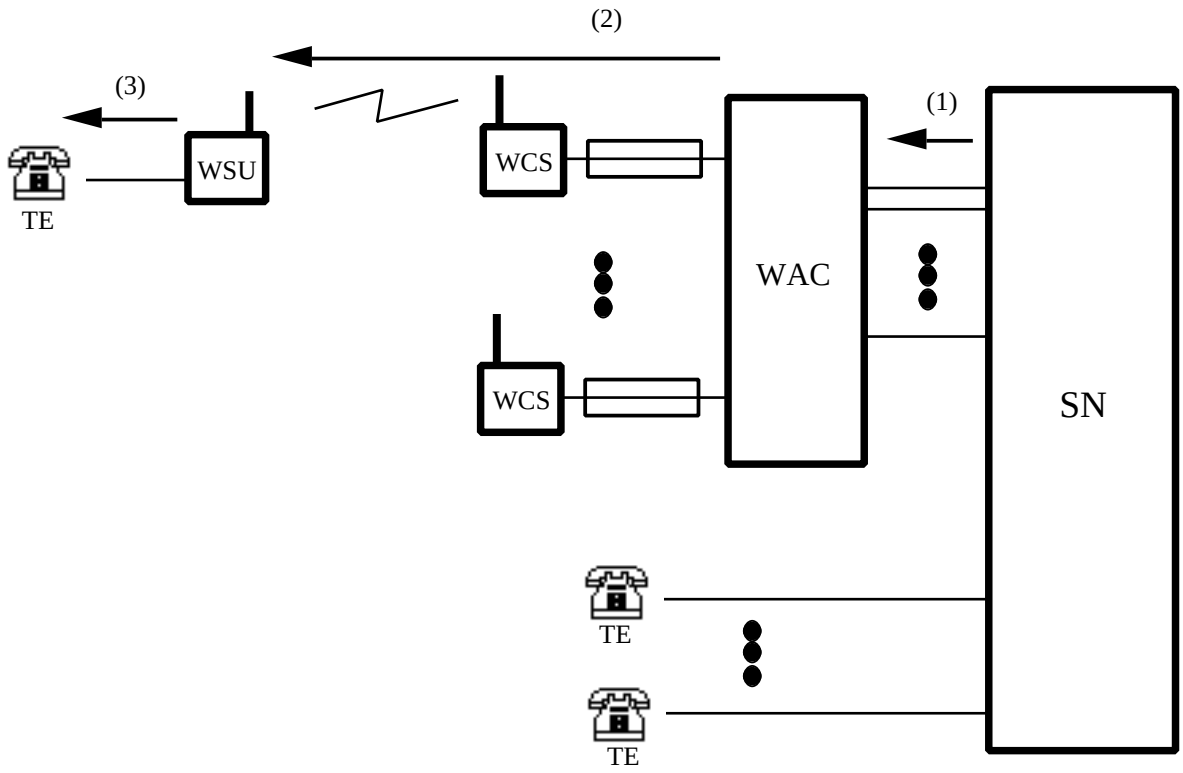
3.5.7 Meter Pulsing Signal Delivery

Figure 3-12/C-NW1.00 shows an example of meter pulsing signal delivery procedure.

(1) Meter pulsing signal is sent to WAC during communication in progress.

(2) WAC detect the charging signal, and puts in this information to INFOrmation message to WSU.

(3) WAC receives INFOrmation message, and generates meter pulsing signal to TE.



(1) Meter pulsing signal is sent to WAC during communication in progress.
(2) WAC detect the charging signal, and puts in this information to INFOrmation message to WSU.
(3) WAC receives INFOrmation message, and generates meter pulsing signal to TE.

Figure 3-12/C-NW1.00 Meter Pulsing Signal Delivery

3.6 ISDN Procedure

ISDN service is realized by Type 2 system. In Type 2 system, the communication channels are established by using public PHS interface, and those channels are act as B channels and D channel of the Network. The signaling messages of Layer 2 and/or Layer 3 are transparently conveyed through the D channel.

Figure 3-13/C-NW1.00 shows an example of ISDN call set up sequence.

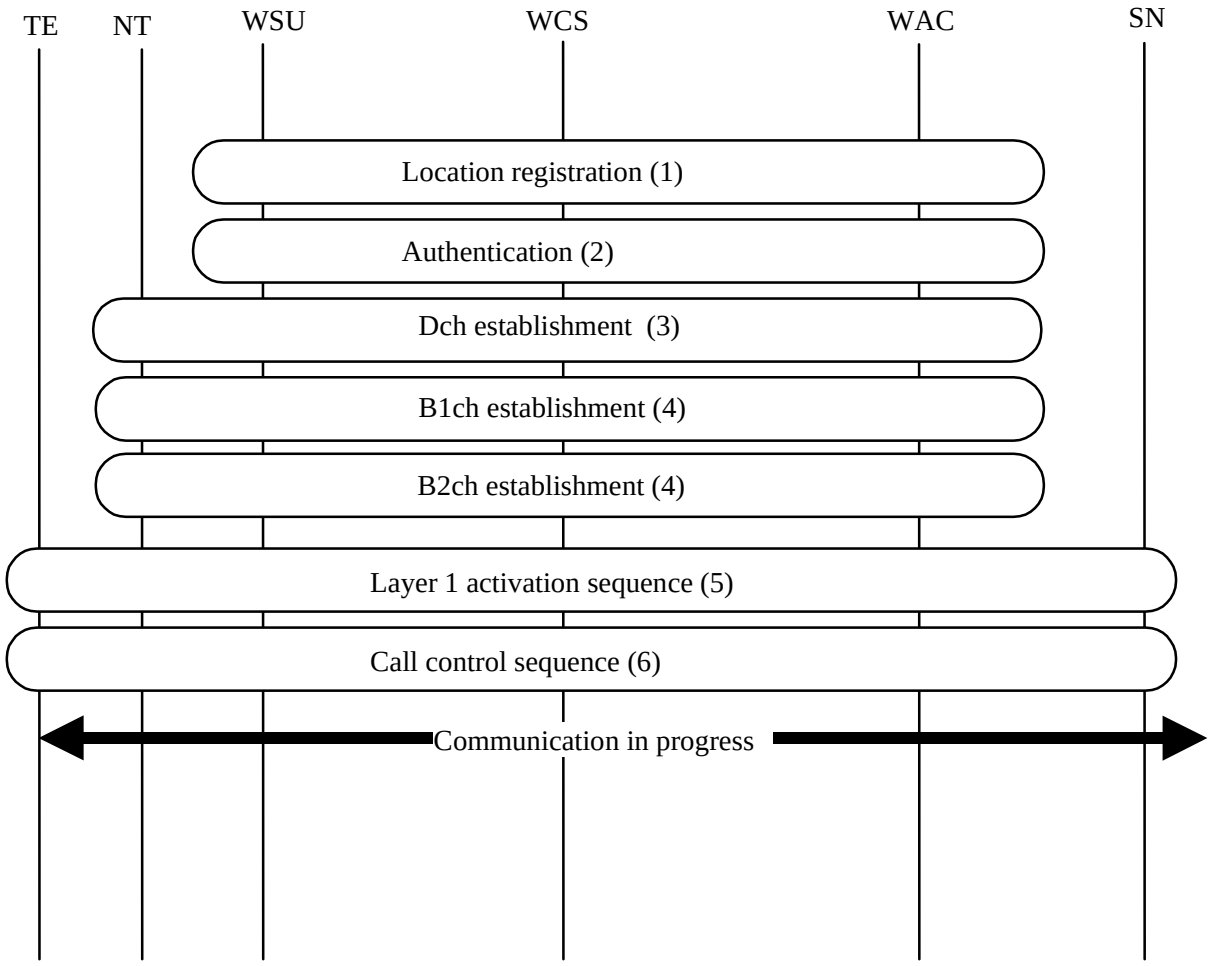


Figure 3-13/C-NW1.00 An example of ISDN call set up sequence

(1) Location Registration

Location Registration procedure conforms to sub-clause 3.3 of this specification.

(2) Authentication

Authentication procedure conforms to sub-clause 3.4 of this specification.

(3) D channel establishment

D channel is using a part of 32kbit/s physical communication channel of PHS.

D channel establishment sequence conforms to C-IF2.01.

(4) B channel (B1ch/B2ch) establishment

B channel (B1ch/B2ch) is using 64kbit/s physical communication channel of PHS.

B channel establishment sequence conforms to C-IF2.01.

(5) Layer 1 activation

Layer 1 activation sequence conforms to C-IF1.02, C-IF3.02, C-IF3.03, C-IF3.05.

(6) Call control

In call control sequence, the signaling messages of Layer 2 and/or Layer 3 are transparently conveyed through the D channel.

3.7 Leased Line Procedure

Leased line service is realized by Type 2 system. In Type 2 system, the communication channels are established by using public PHS interface.

Figure 3-14/C-NW1.00 shows an example of leased line set up sequence.

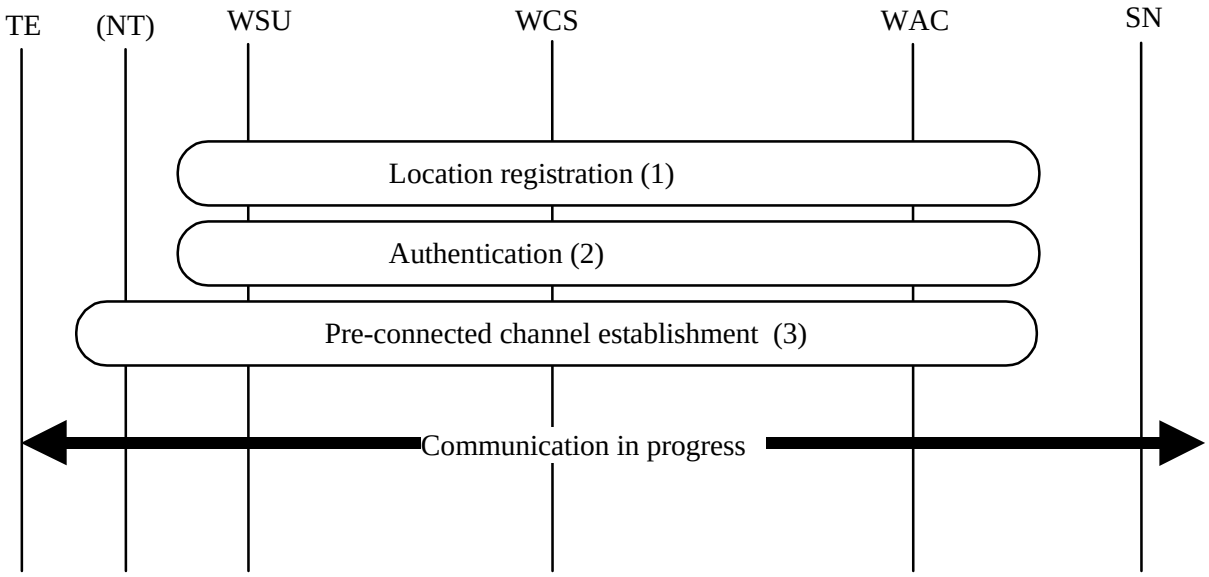


Figure 3-14/C-NW1.00 An example of leased line set up sequence

(1) Location Registration

Location Registration procedure conforms to sub-clause 3.3 of this specification.

(2) Authentication

Authentication procedure conforms to sub-clause 3.4 of this specification.

(3) Pre-connected channel establishment

Pre-connected channel is using 32kbit/s, 64kbit/s and 128kbit/s (= 64kbit/s * 2) physical communication channel of PHS.

Physical communication channel establishment sequence conforms to C-IF2.01.

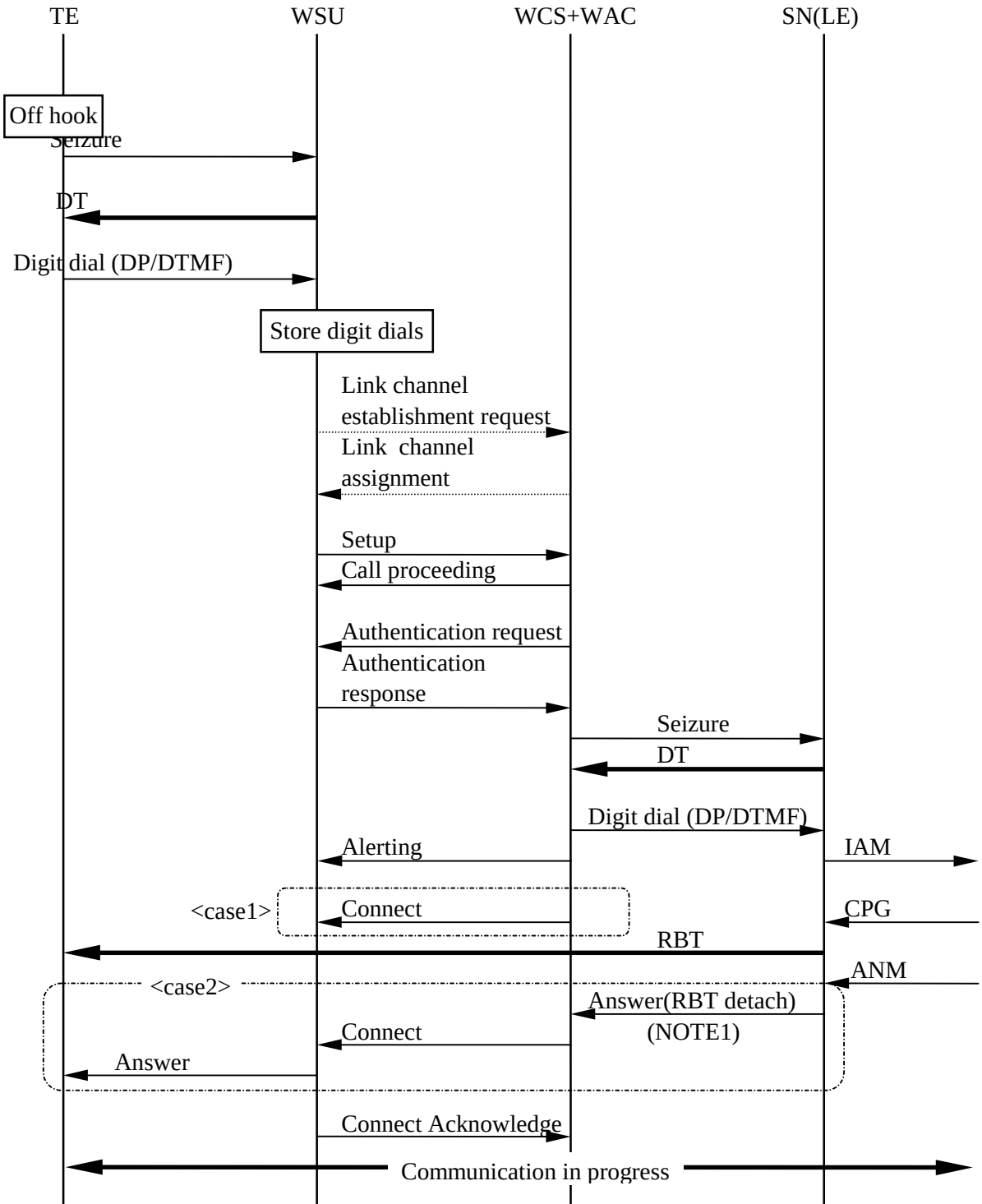
Appendix A. Example of Sequence

This appendix indicate some examples of message sequence. The Network signaling protocol is assumed to be the signaling system No.7. Network messages are indicated only essential messages which effect to the FWA network. These figures are intended to complement the description in the proceeding text and do not illustrate all possible situations.

The definition of messages, signals, in-band tones, and timers are described in C-IF series documents.

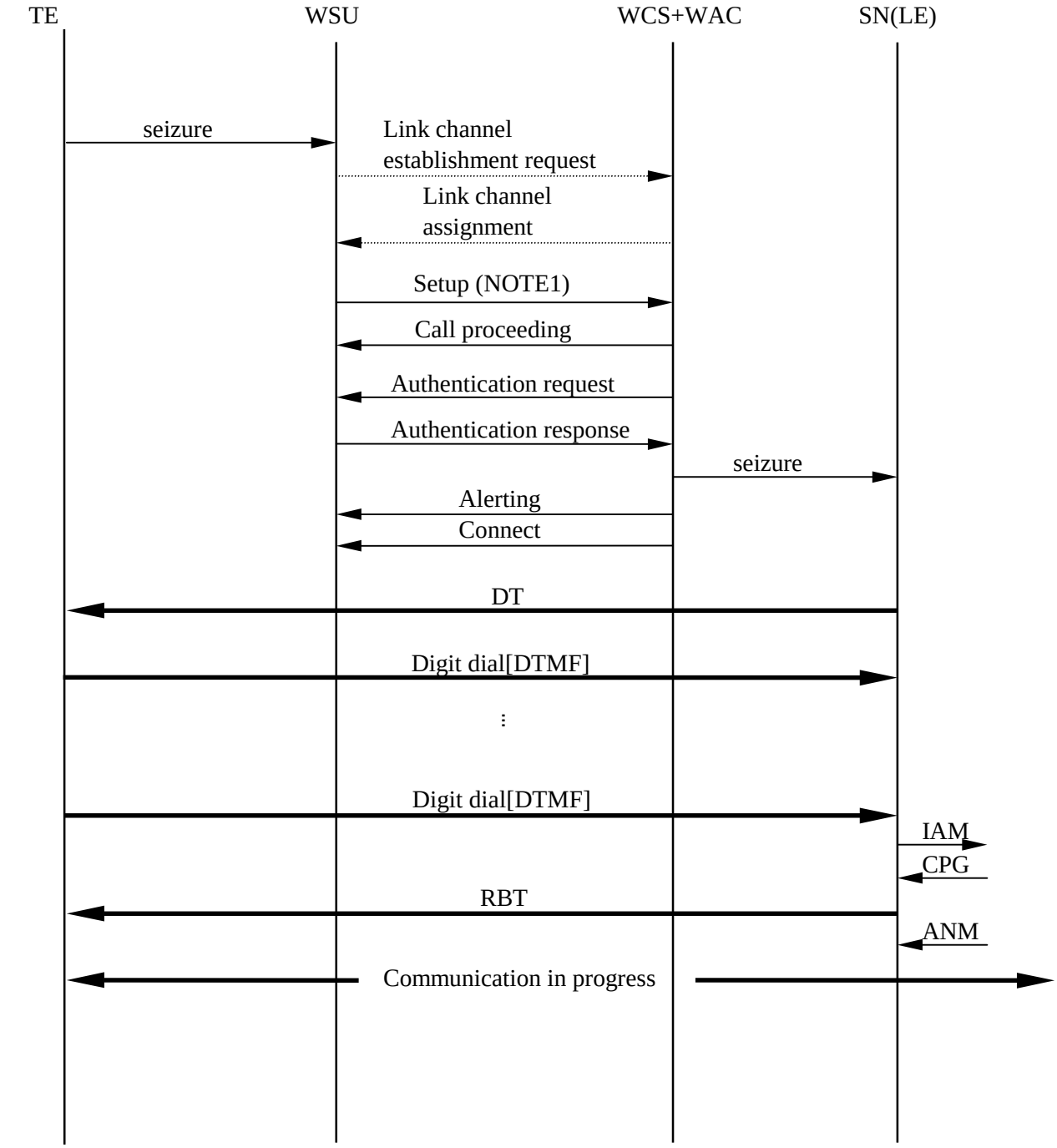
< NOTE >
The timer T15 is equivalent to the timer T5 of C-IF1.01. T35 is equivalent to the release guard timing of C-IF3.01 or re-answer timing of C-IF3.03.

A.1 Two-wire Analogue Interface
A1.1 Originating call



NOTE1: In some network,this Answer signal is not transmitted. In this case, Case l should be applied.

Figure A1-1/C-NW1.00(1/6) Originating Call (CASE1: en bloc sending)



NOTE1: In this SETUP message, Called Number is not included.

Figure A1-1/C-NW1.00(2/6) Originating Call (CASE2: Overlap sending-Type1)

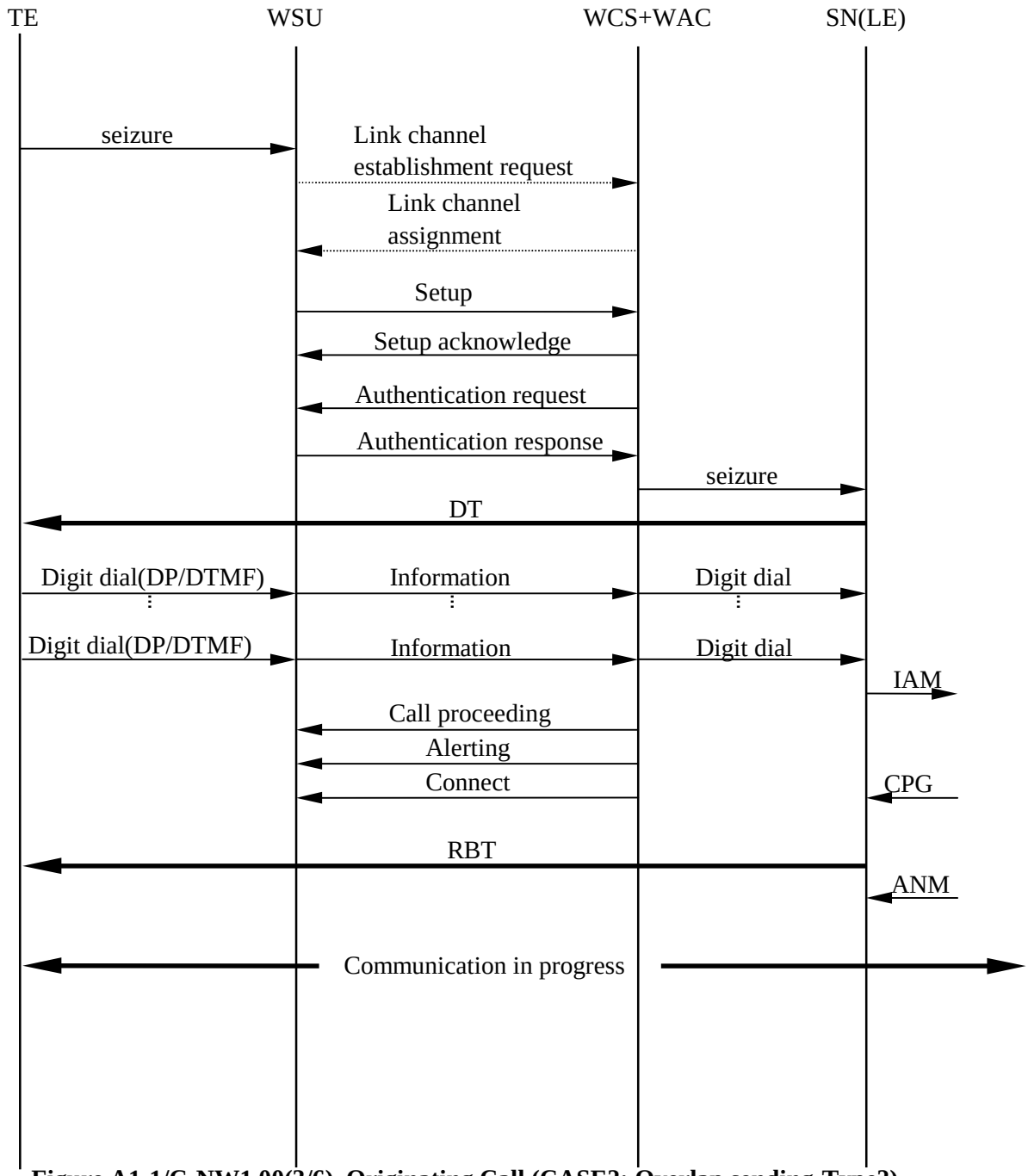


Figure A1-1/C-NW1.00(3/6) Originating Call (CASE2: Overlap sending-Type2)

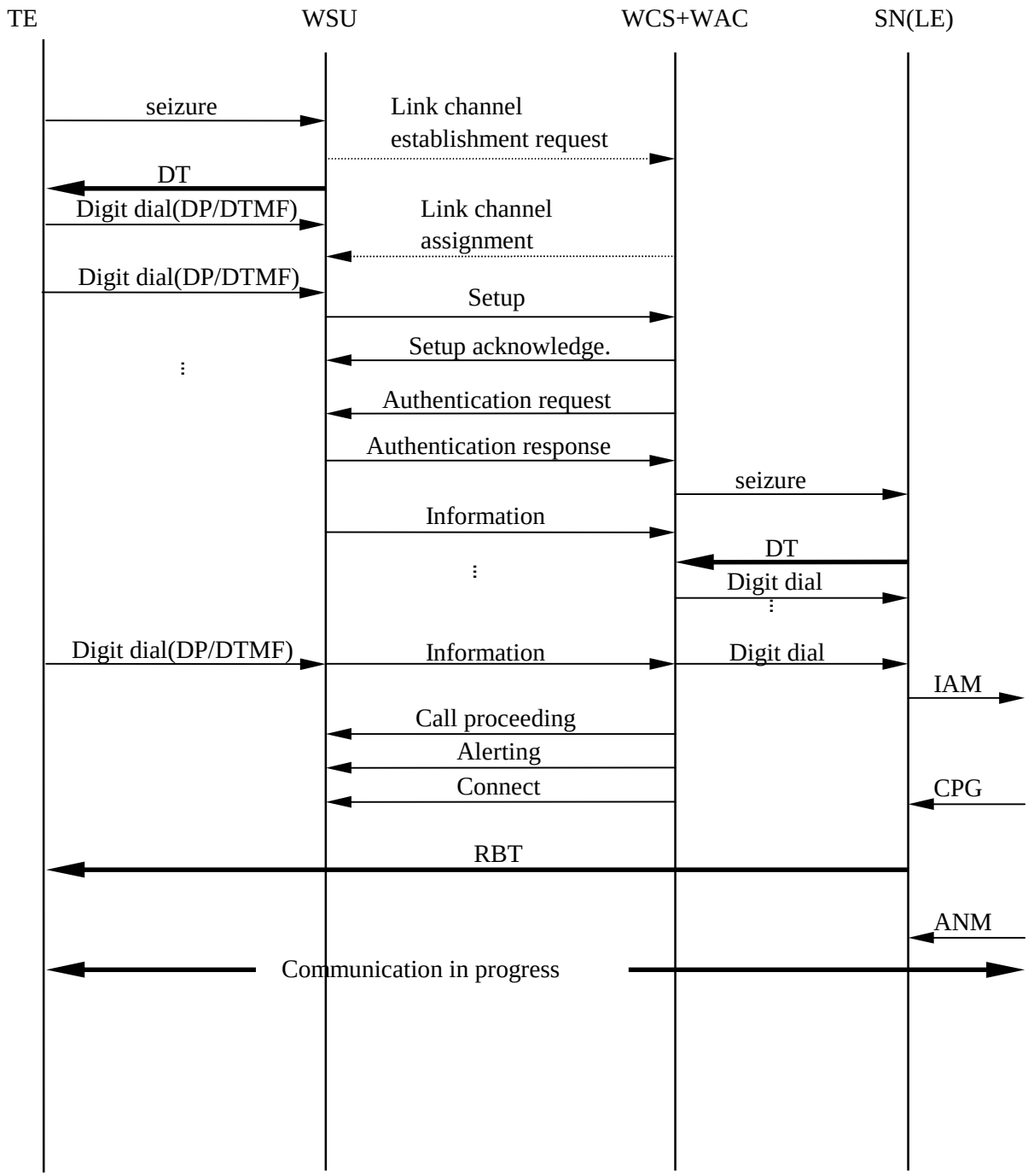


Figure A1-1/C-NW1.00(4/6) Originating Call (CASE2: Overlap sending-Type3)

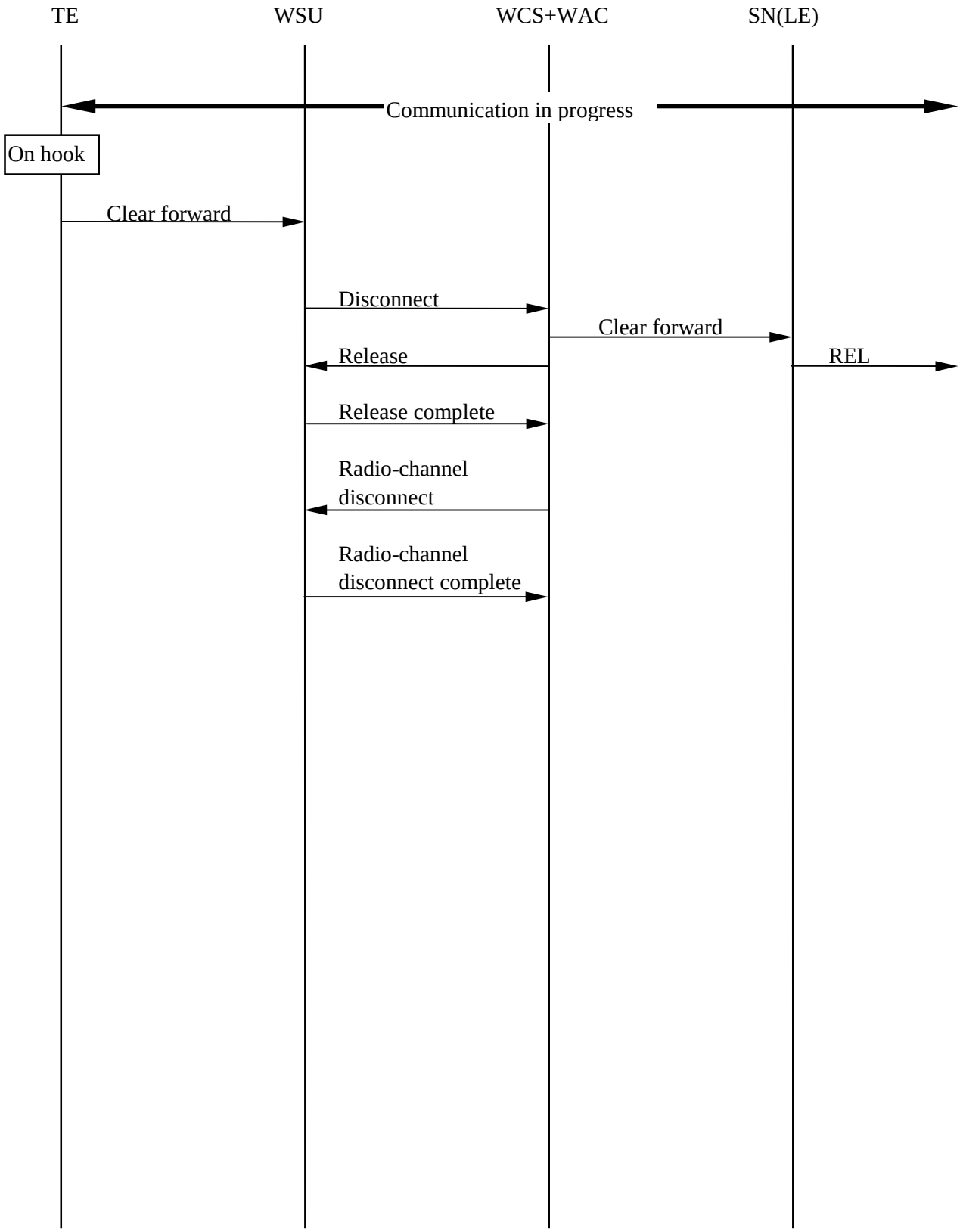


Figure A1-1/C-NW1.00(5/6) Originating Call (FWA-Release)

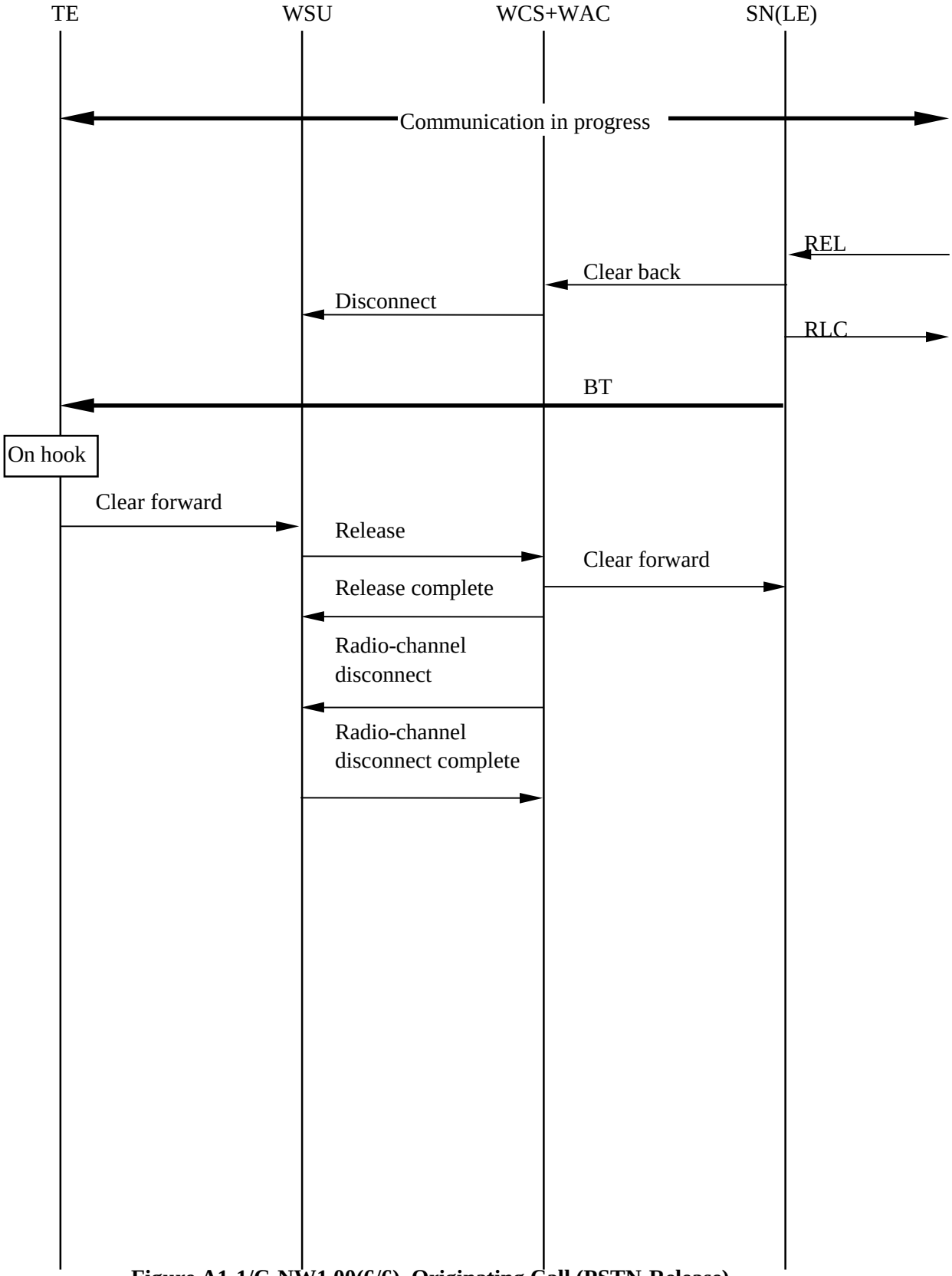


Figure A1-1/C-NW1.00(6/6) Originating Call (PSTN-Release)

A1.2 Terminating Call

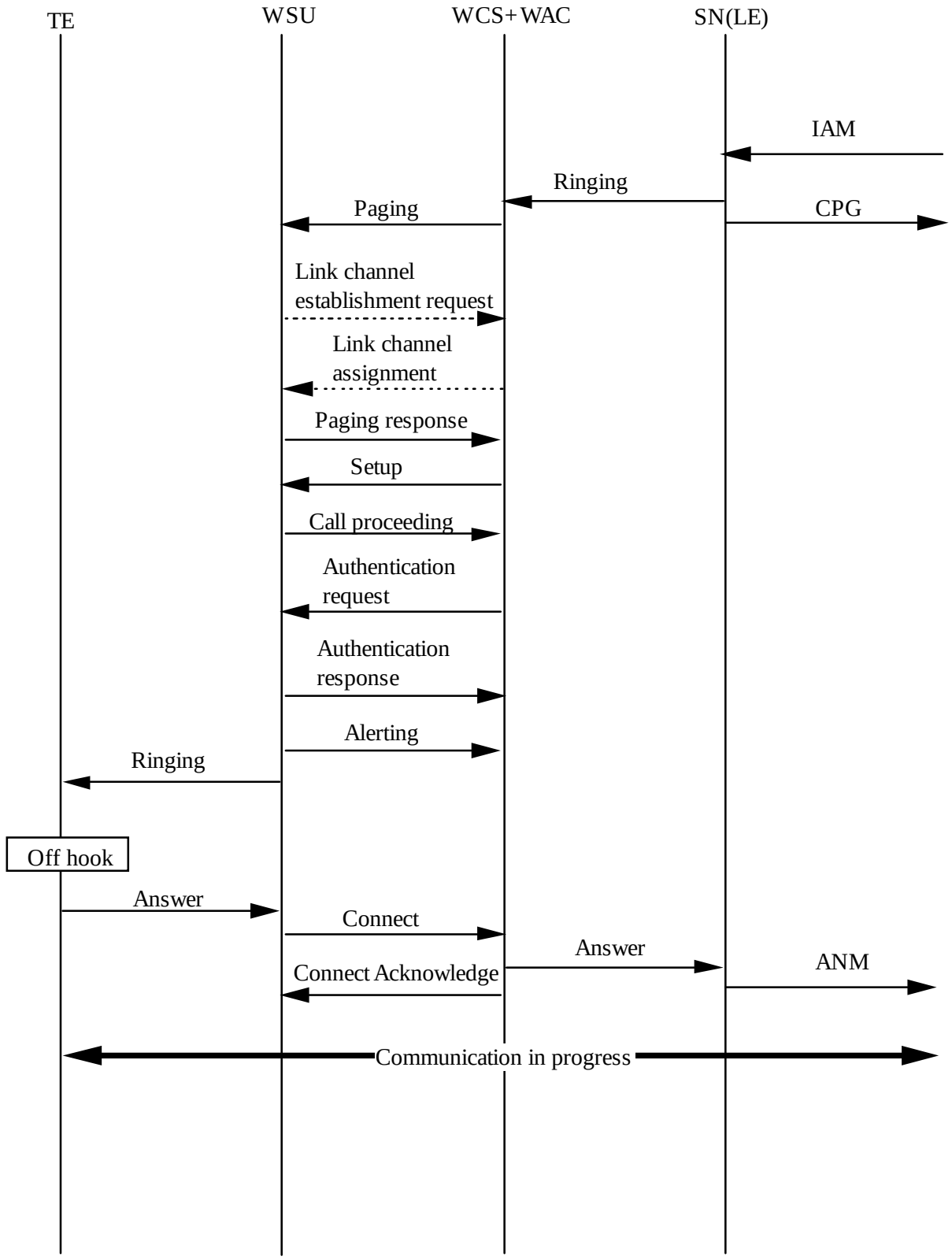


Figure A1-2/C-NW1.00(1/3) Terminating Call

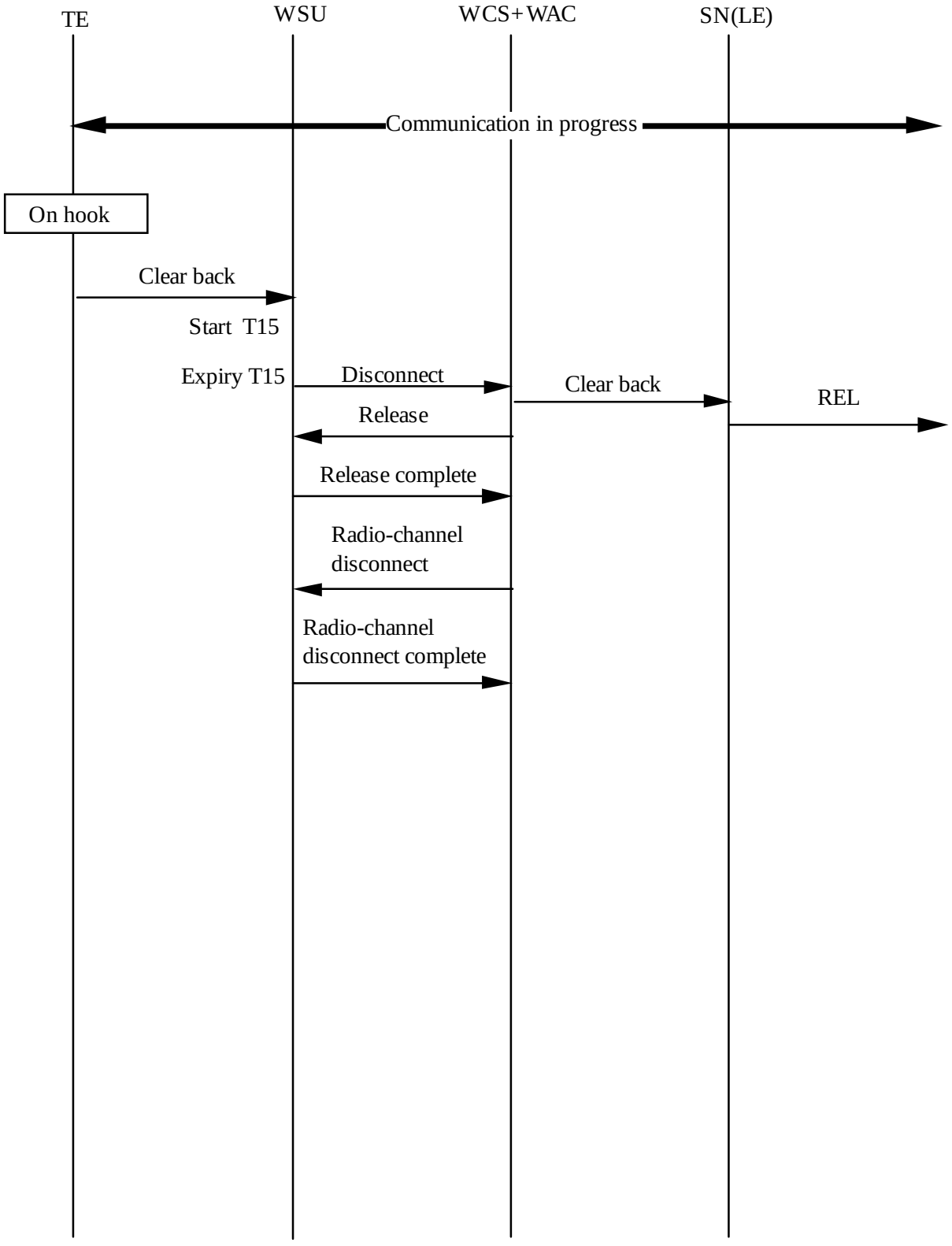


Figure A1-2/C-NW1.00(2/3) Terminating Call (FWA-Release)

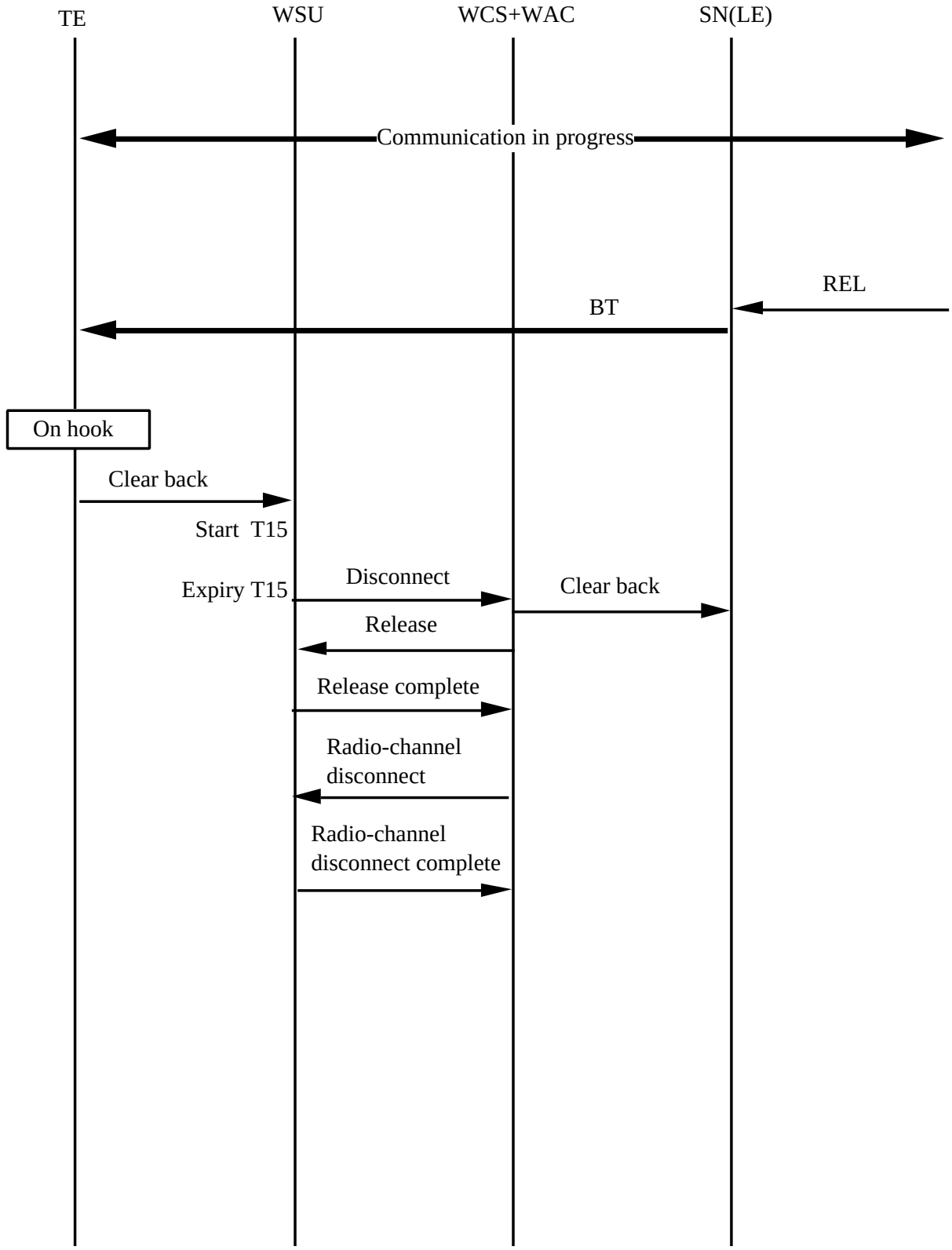


Figure A1-2/C-NW1.00(3/3) Terminating Call (PSTN-Release)

A1.3 Hooking Signal Transmission Procedure

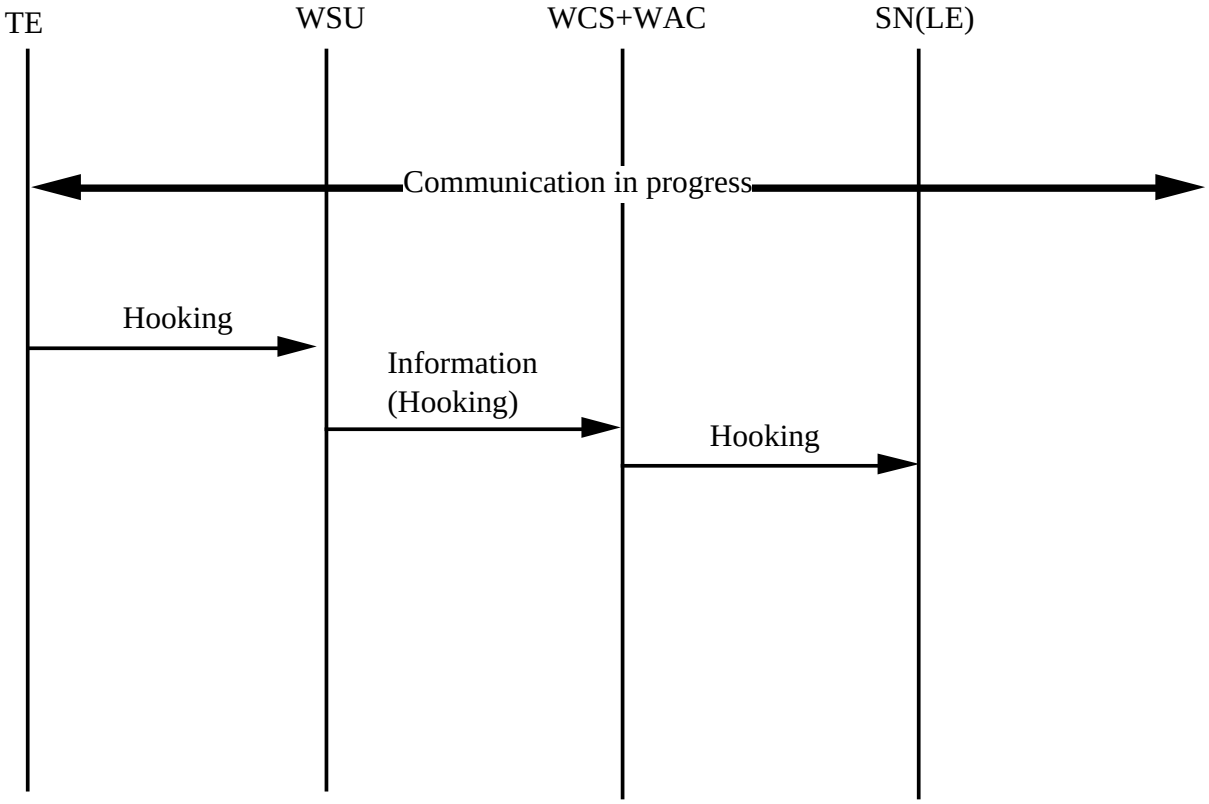


Figure A1-3/C-NW1.00 Hooking Signal Transmission Procedure

A1.4 DTMF Signal Transmission Procedure

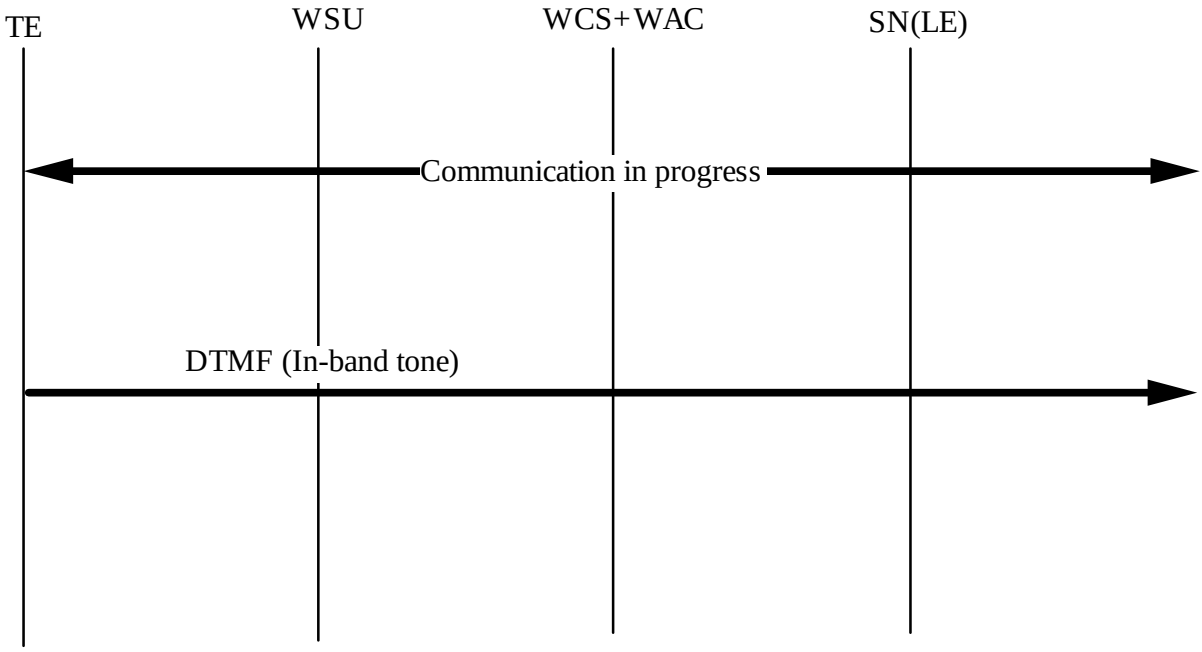


Figure A1-4/C-NW1.00(1/2) DTMF Signal Transmission Procedure (WSU+TE)

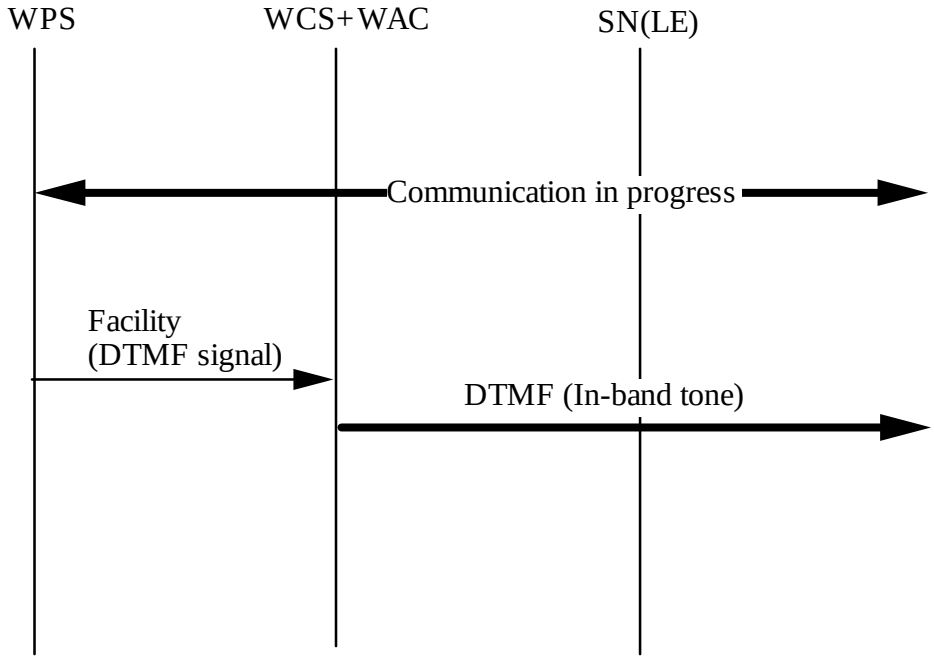
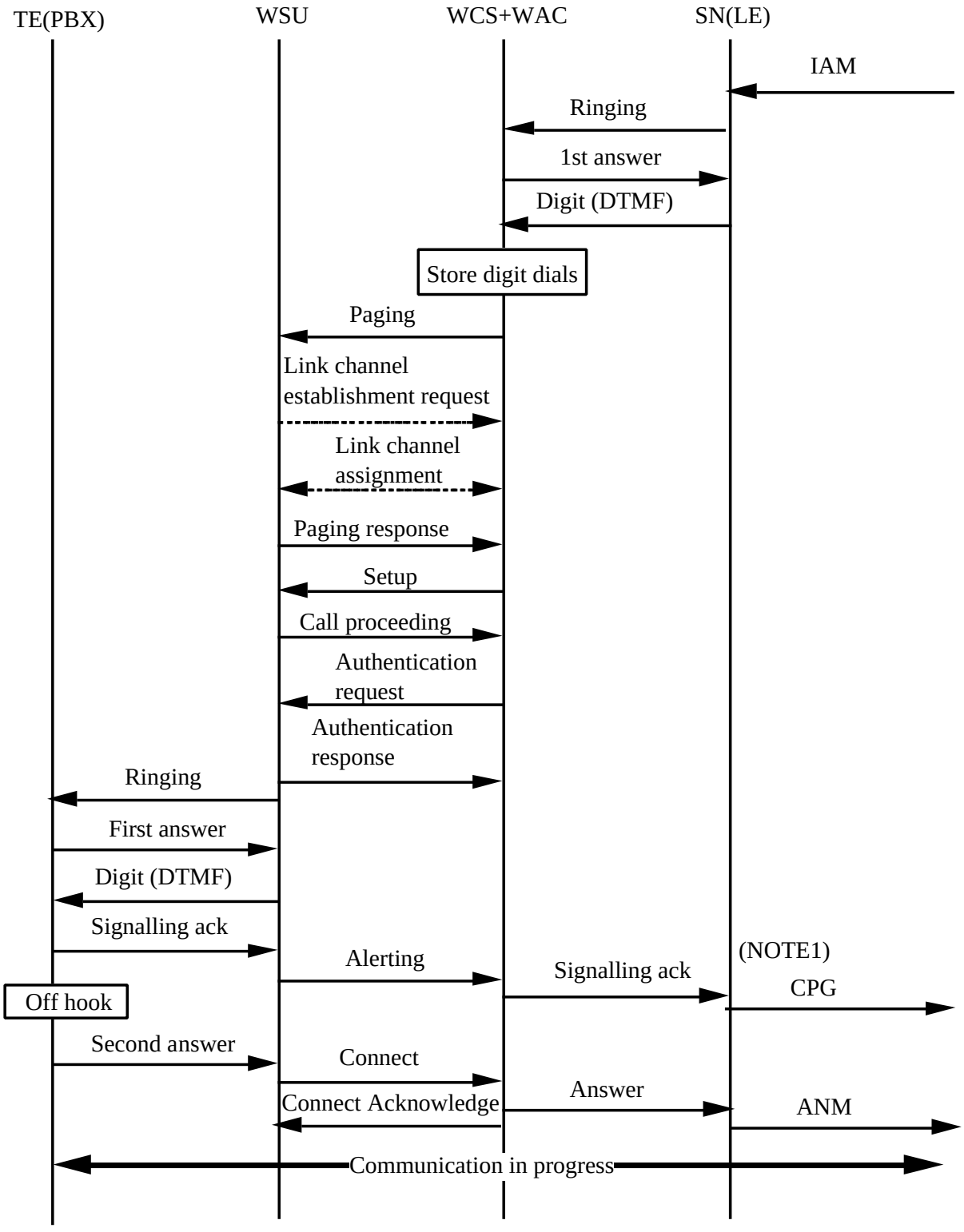


Figure A1-4/C-NW1.00(2/2) DTMF Signal Transmission Procedure (WPS)

A1.5 Direct Dialling In Procedure



NOTE1: The timing condition at WIF3 will be different from usual timing condition.

Figure A1-5/C-NW1.00(1/2) Direct Dialling In Procedure (for NTT)

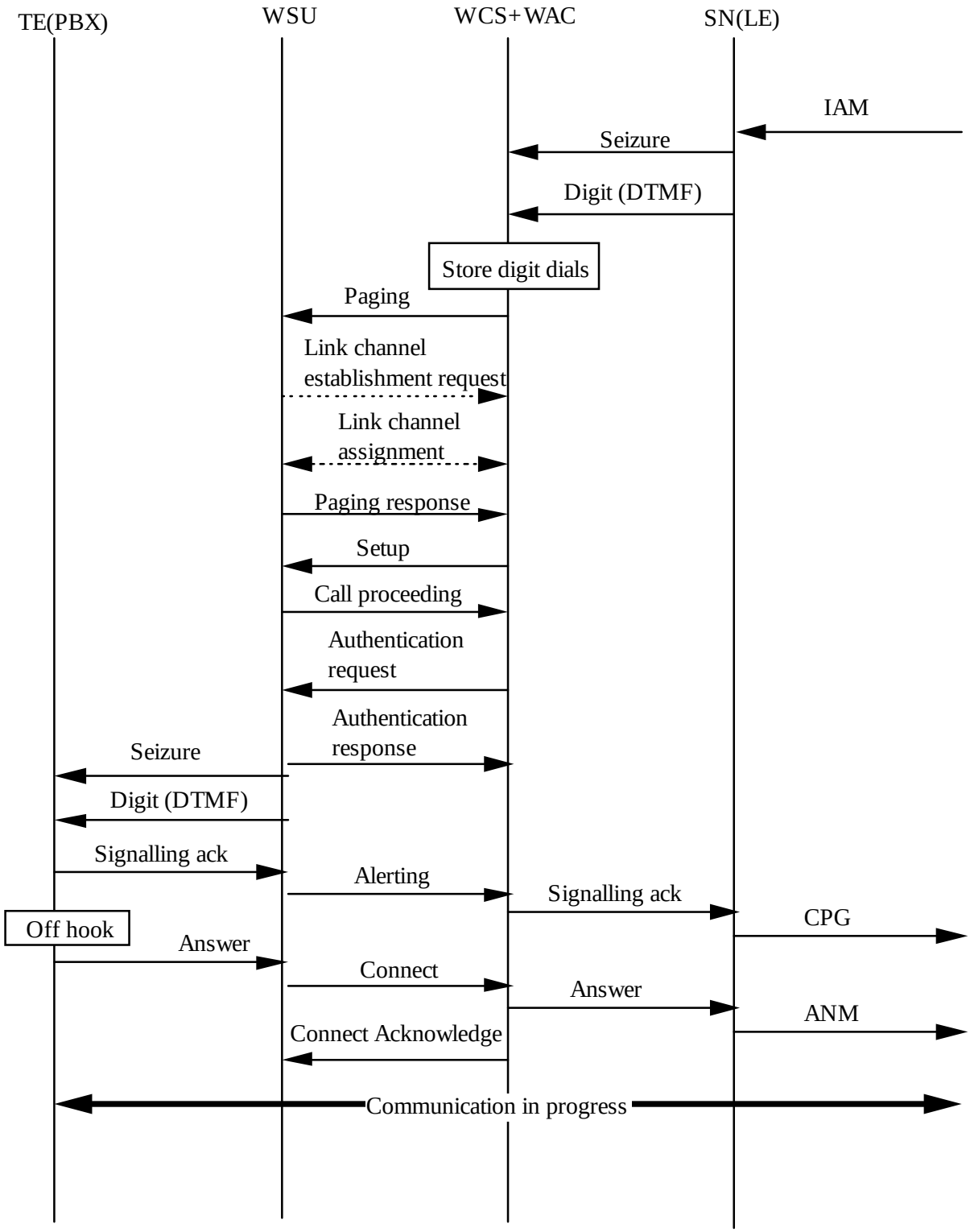


Figure A1-5/C-NW1.00(2/2) Direct Dialling In Procedure (DTMF DDI)

A1.6 Calling Line Identification Presentation Procedure

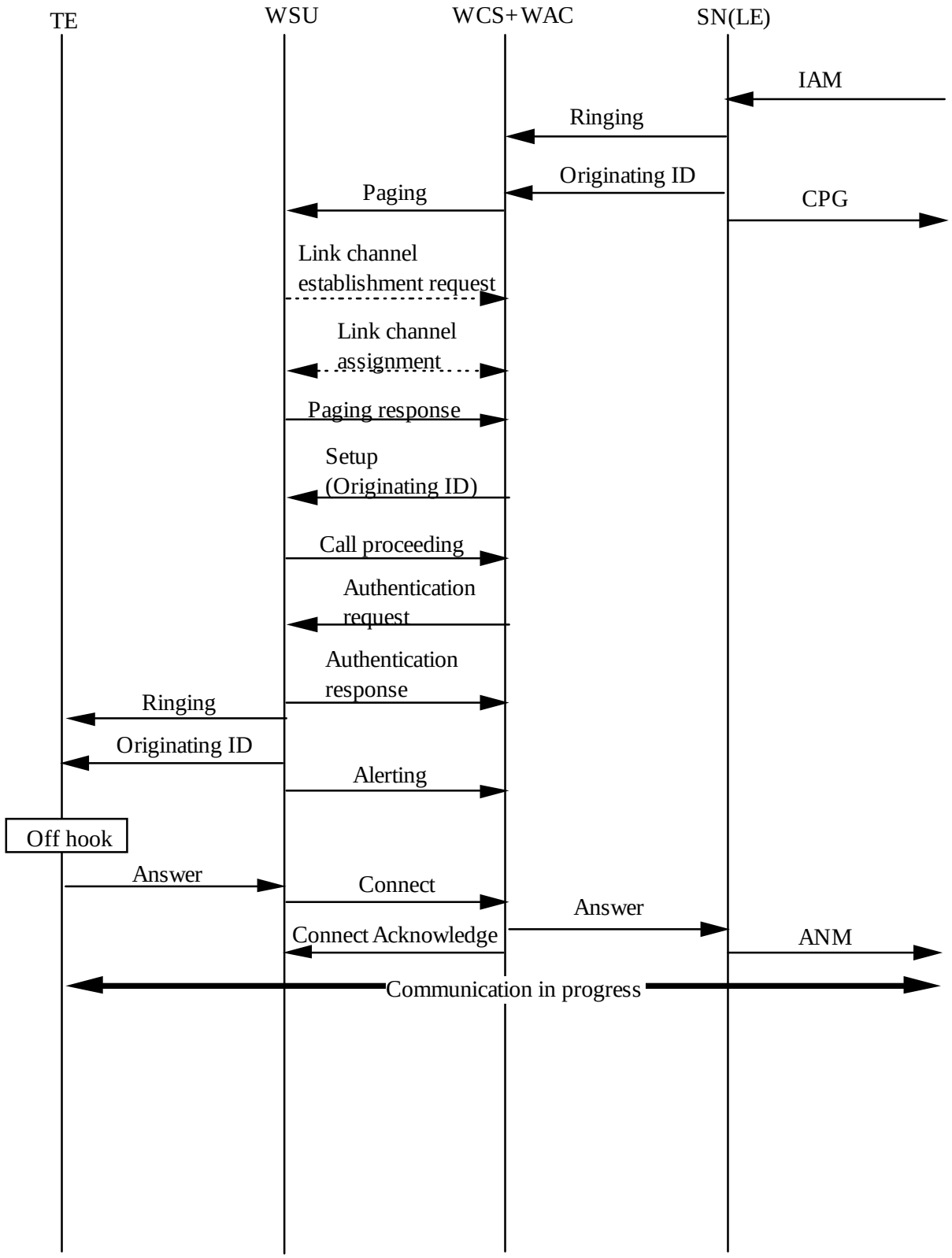
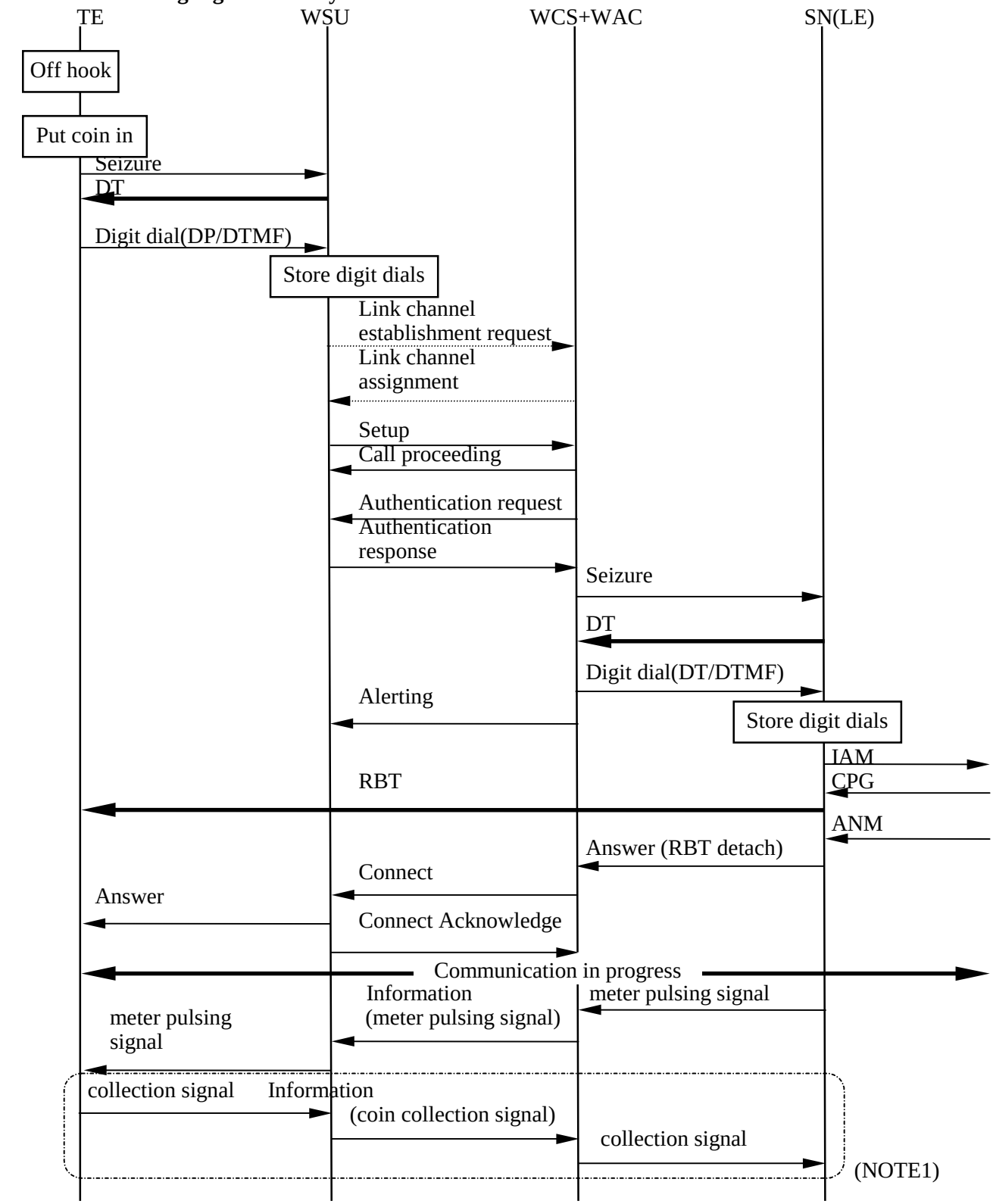


Figure A1-6/C-NW1.00 Calling Line Identification Presentation Procedure

A1.7 Meter Pulsing Signal Delivery Procedure

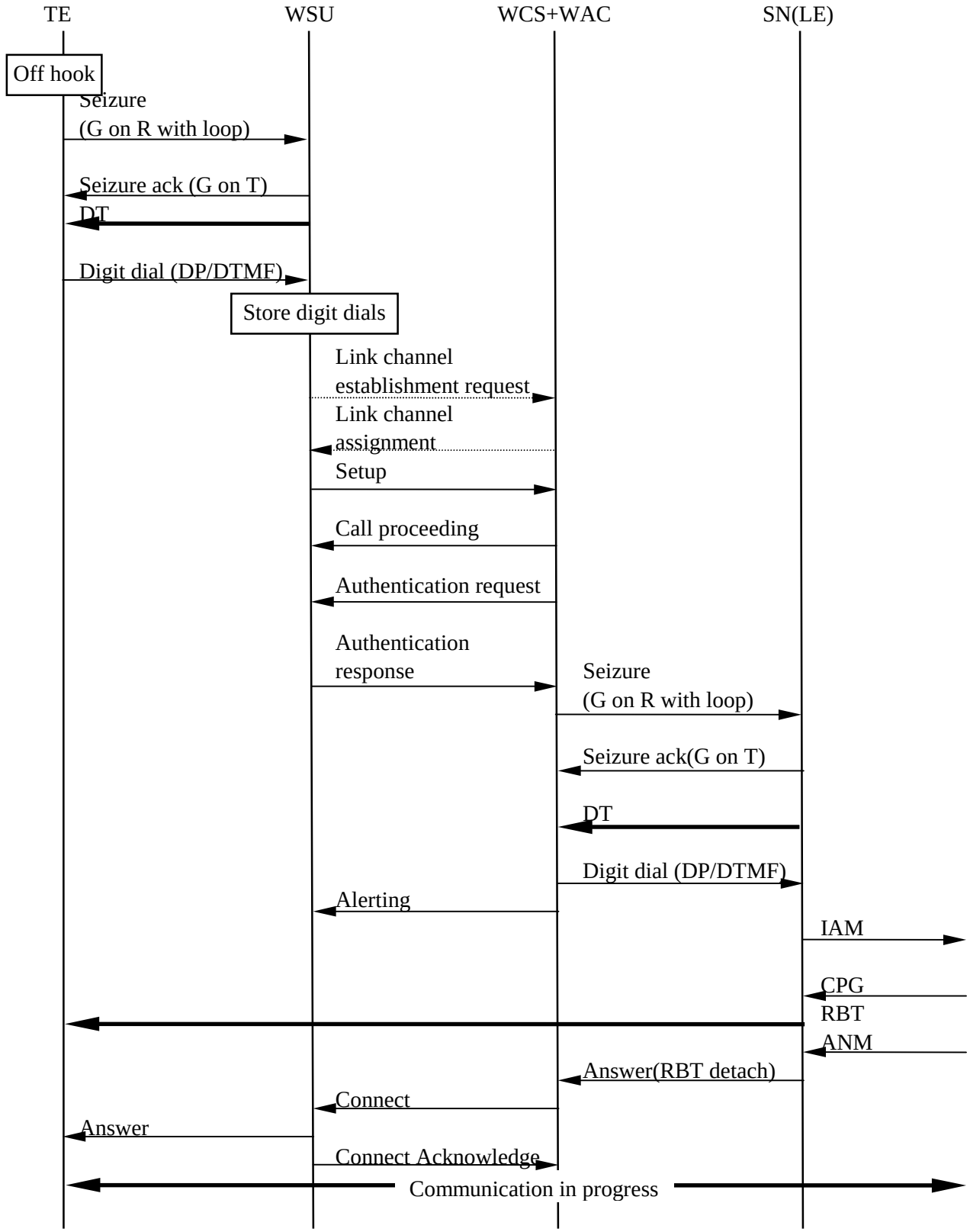


NOTE1: In some countries, this response signal is returned,and the detail specification is specified by the operators of these countries.

NOTE2: This example is indicated based on en bloc sending sequence.

Figure A1-7/C-NW1.00 Meter Pulsing Signal Delivery Procedure

A1.8 Ground Start PBX Procedure

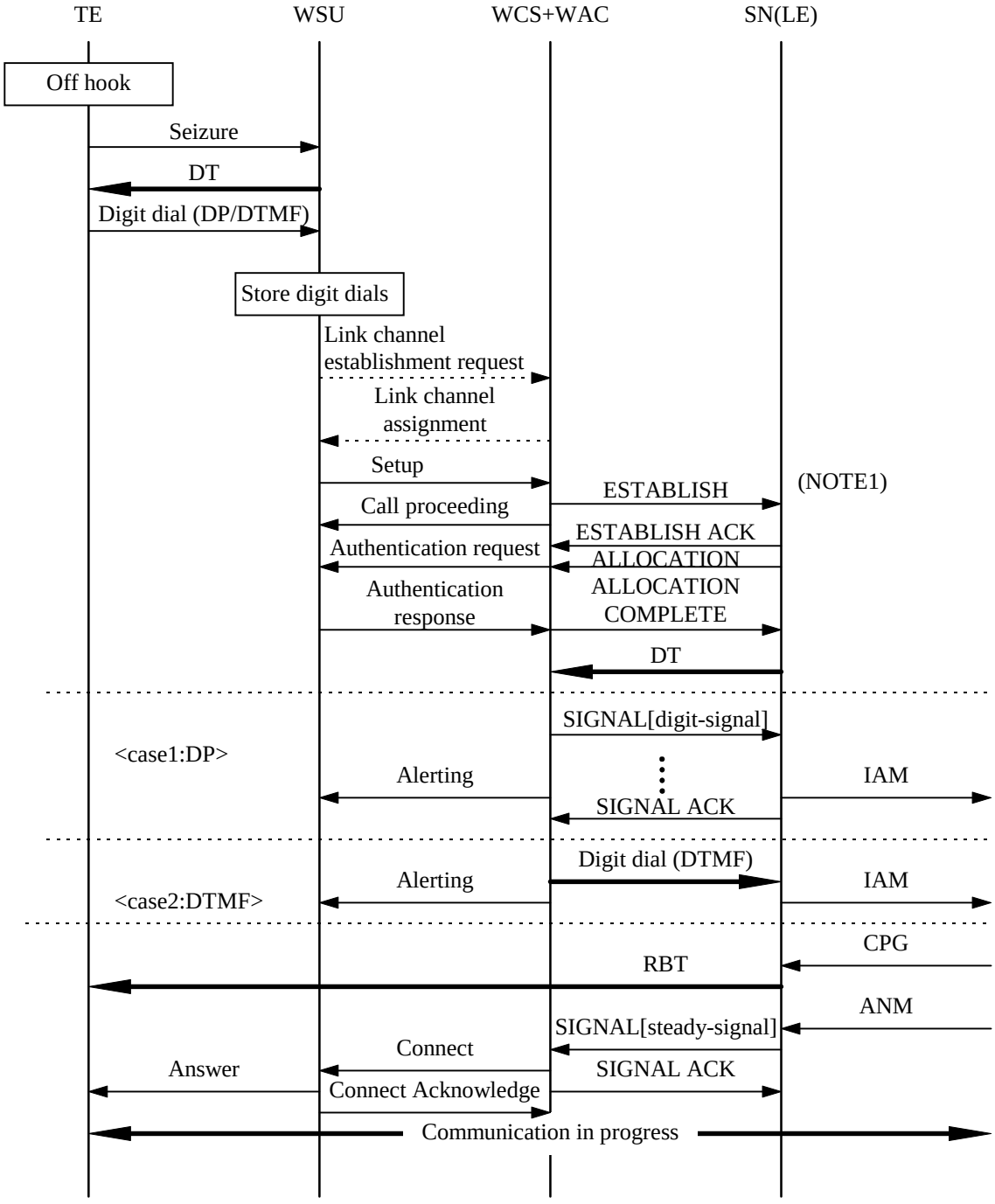


NOTE1: This example is indicated based on en bloc sending sequence.

Figure A1-8/C-NW1.00 Ground Start PBX Procedure

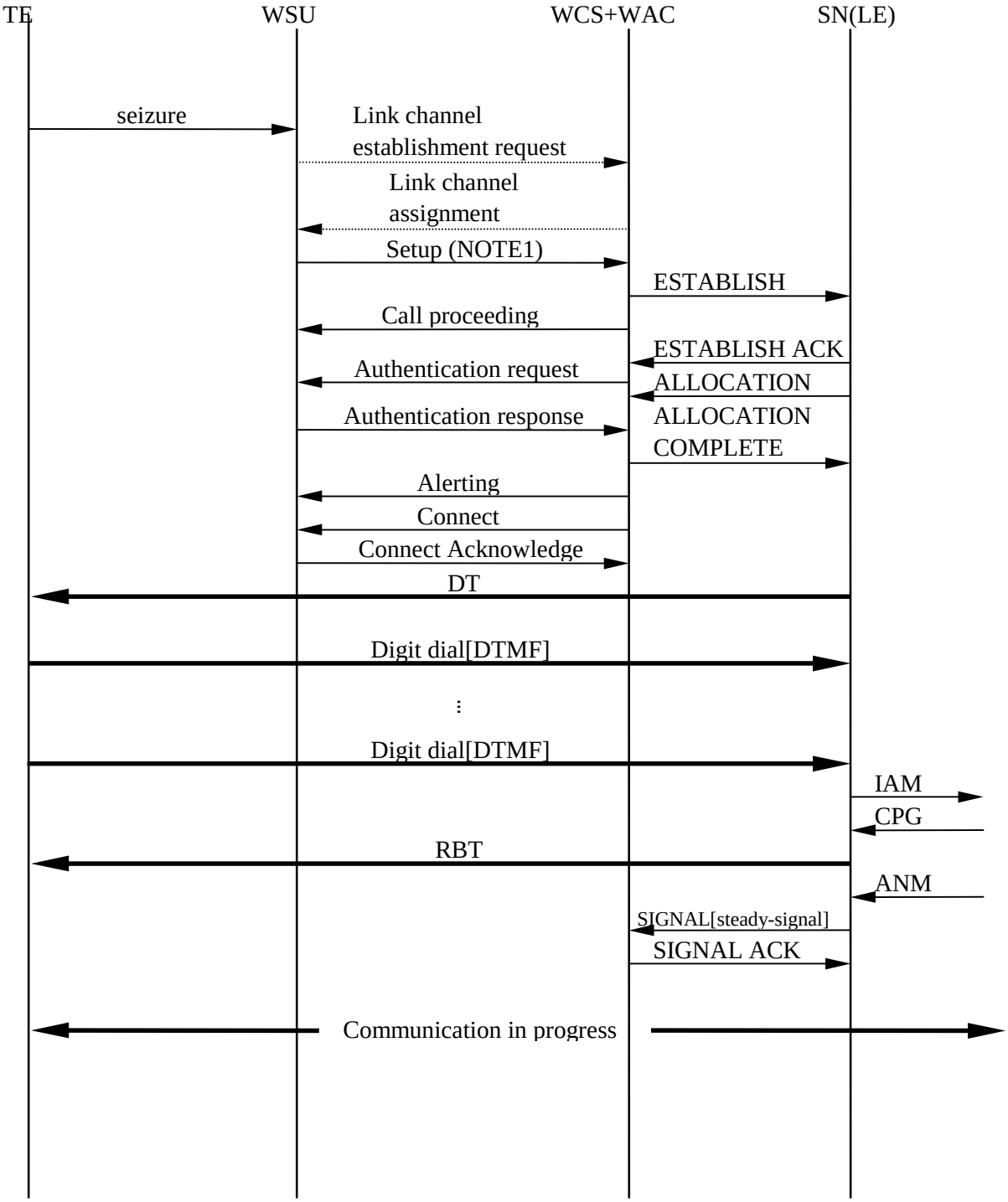
A.2 ITU-T G.965 Interface

A2.1 Originating Call



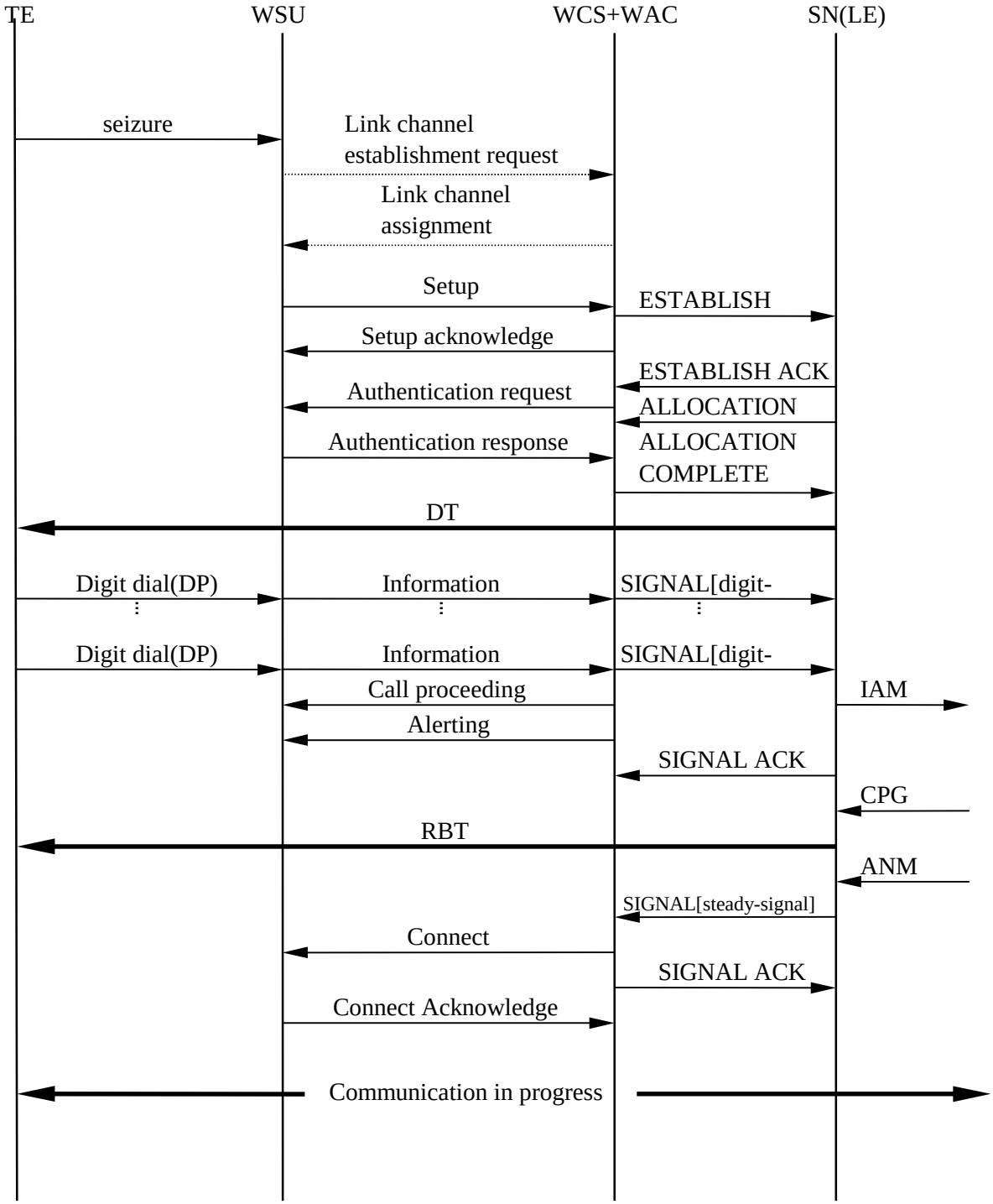
NOTE1: After receipt of Setup message, the sequence following ESTABLISH message is independent from the authentication procedure.

Figure A2-1/C-NW1.00(1/6) Originating Call (CASE1: en bloc sending)



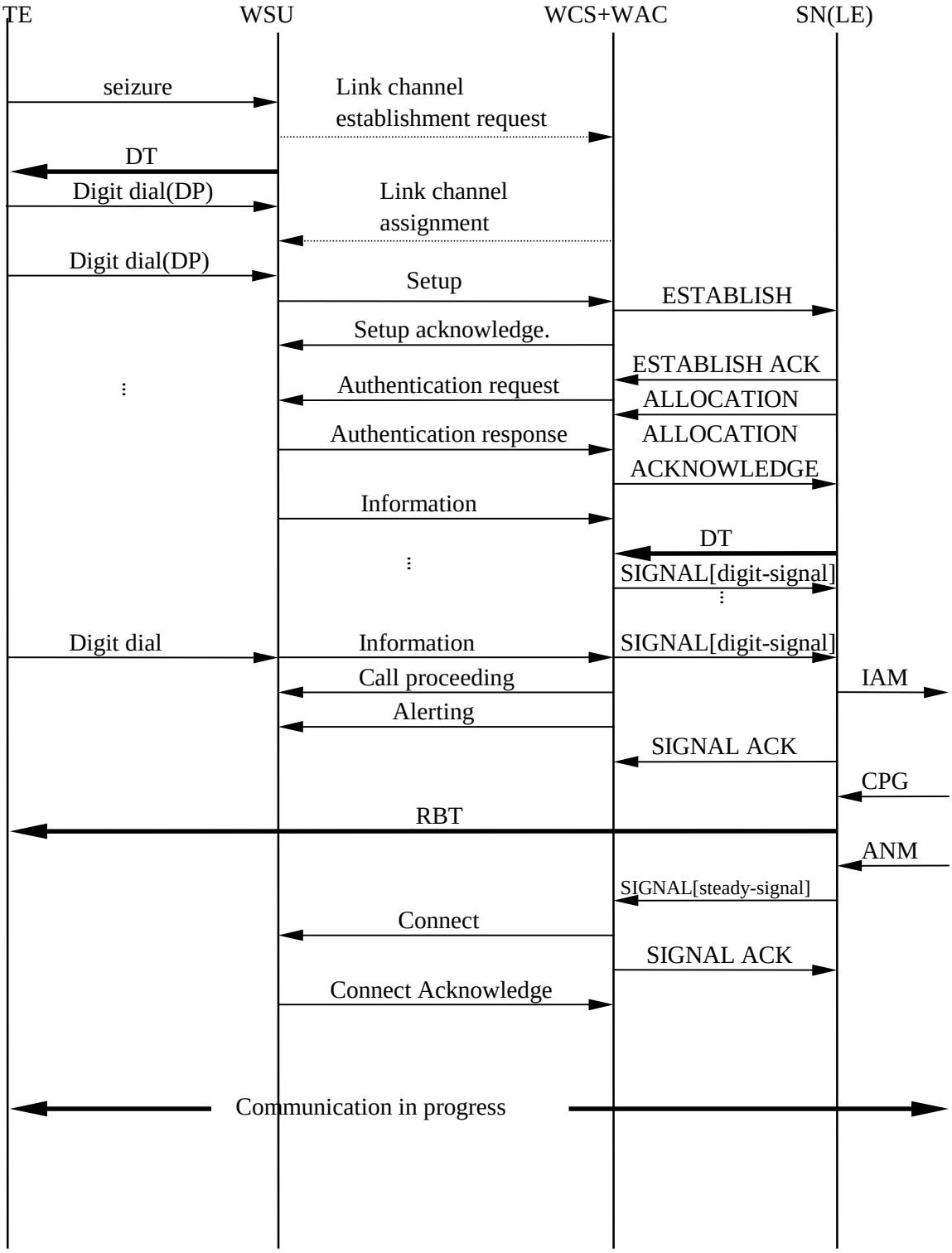
NOTE1: In this SETUP message, Called Number is not included.

Figure A2-1/C-NW1.00(2/6) Originating Call (CASE2: Overlap sending-Type1)



Note1: This example is indicated based on digit signal.

Figure A2-1/C-NW1.00(3/6) Originating Call (CASE2: Overlap sending-Type2)



Note1: This example is indicated based on digit signal.

Figure A2-1/C-NW1.00(4/6) Originating Call (CASE2: Overlap sending-Type3)

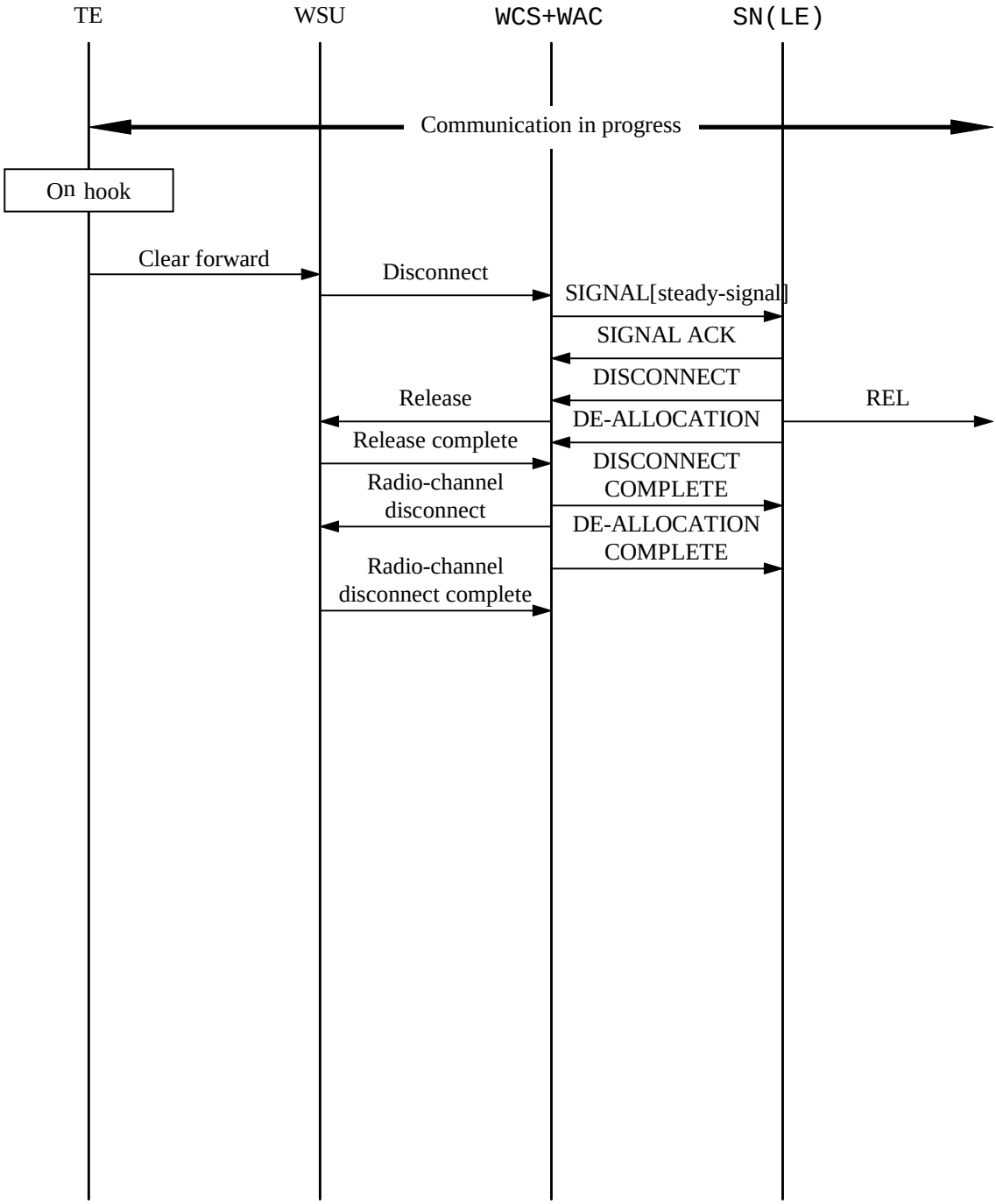
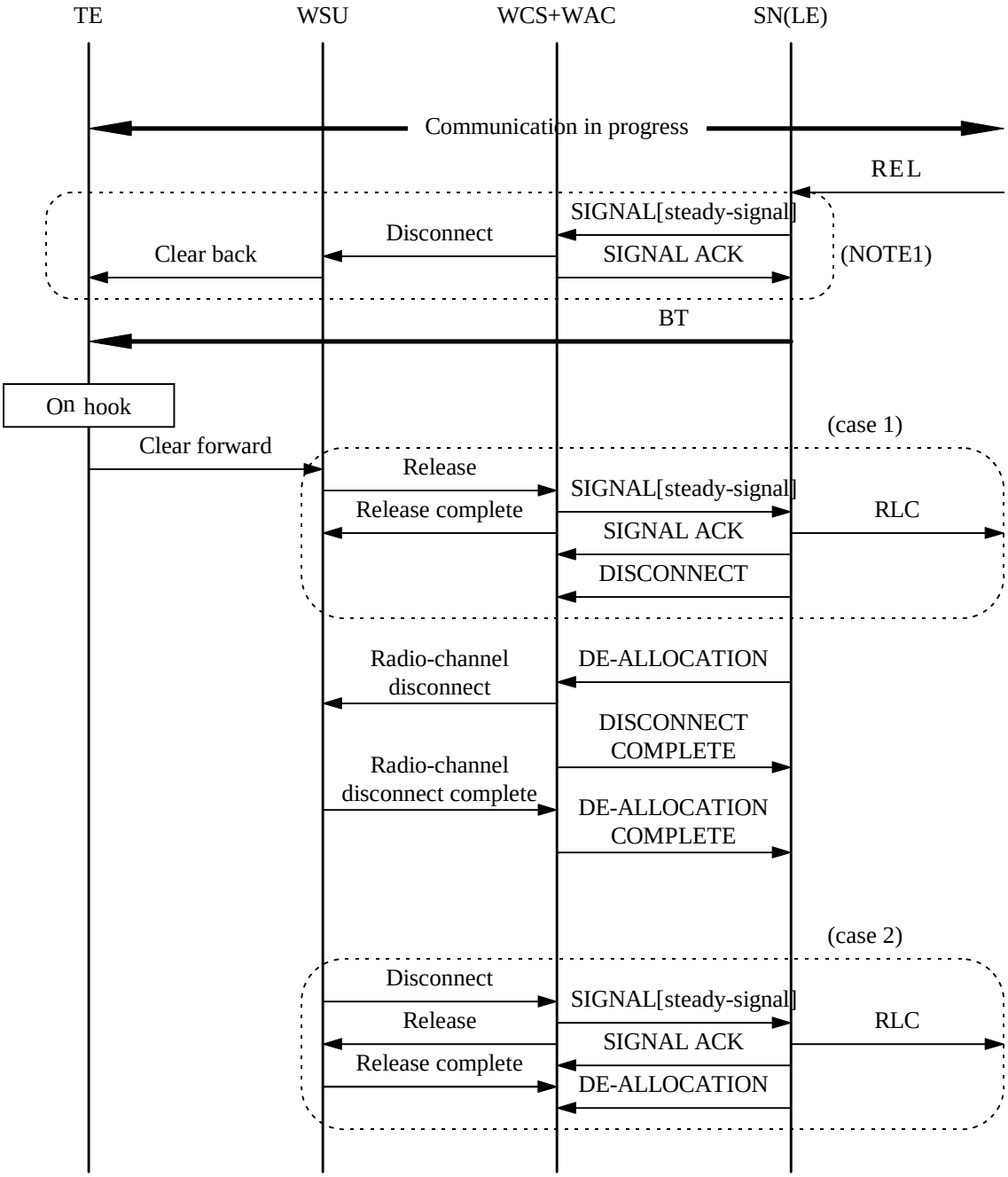


Figure A2-1/C-NW1.00(5/6) Originating Call (FWA-Release)



NOTE1: If SN doesn't recognize SIGNAL[steady-signal] message, case1 should be replaced by case2.

Figure A2-1/C-NW1.00(6/6) Originating Call (PSTN-Release)

A2.2 Terminating Call

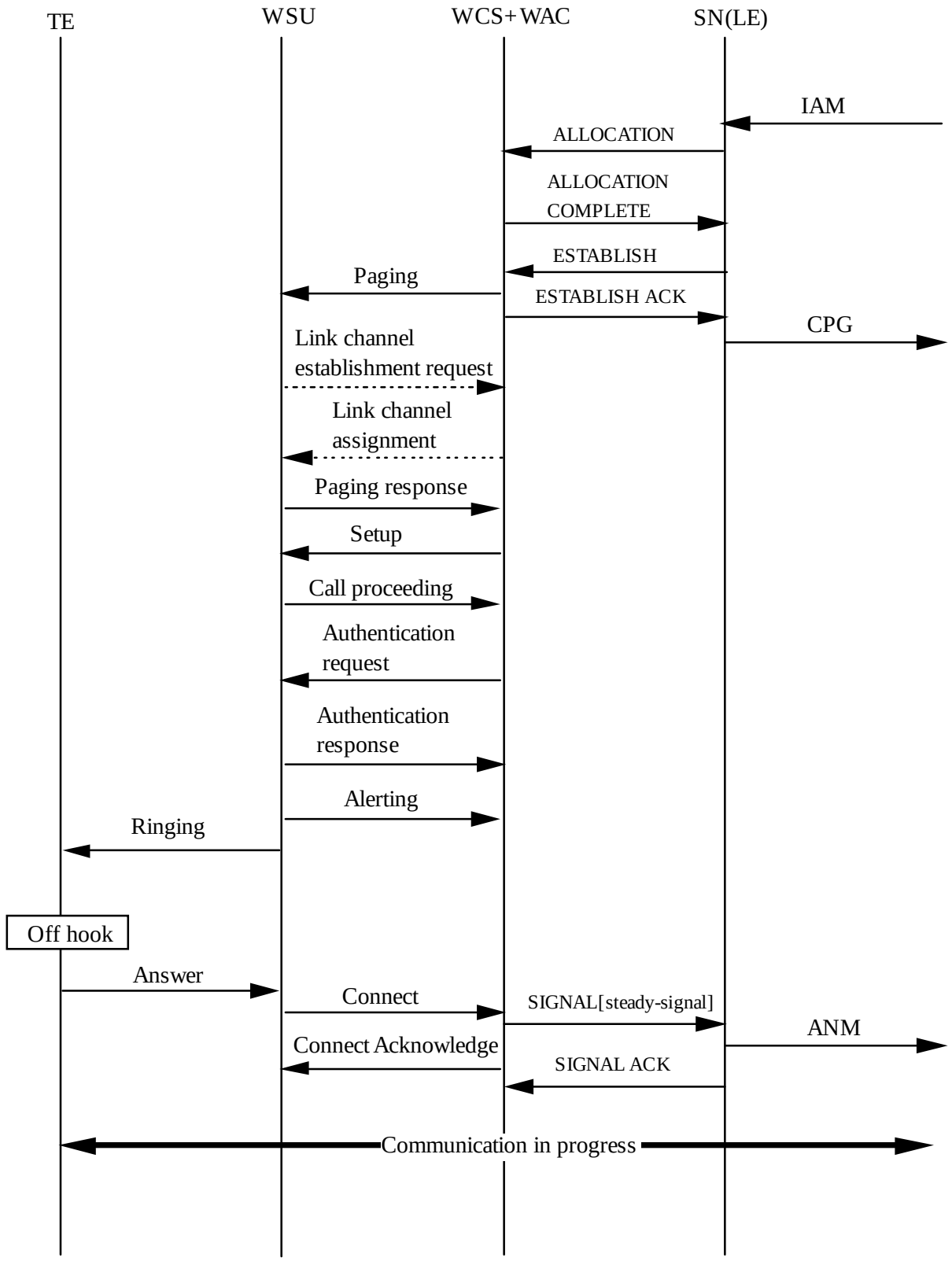


Figure A2-2/C-NW1.00(1/3) Terminating Call

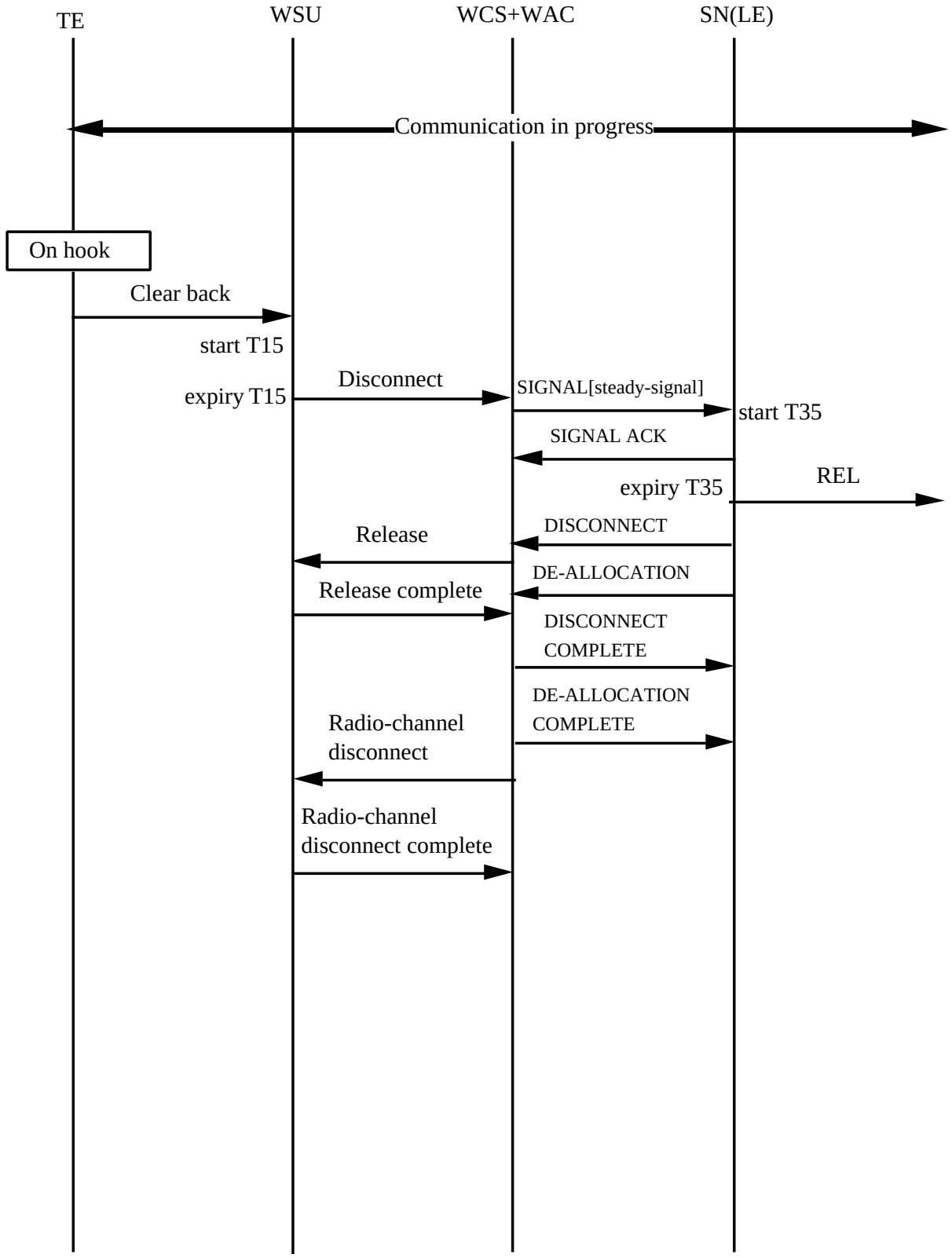


Figure A2-2/C-NW1.00(2/3) Terminating Call (FWA-Release)

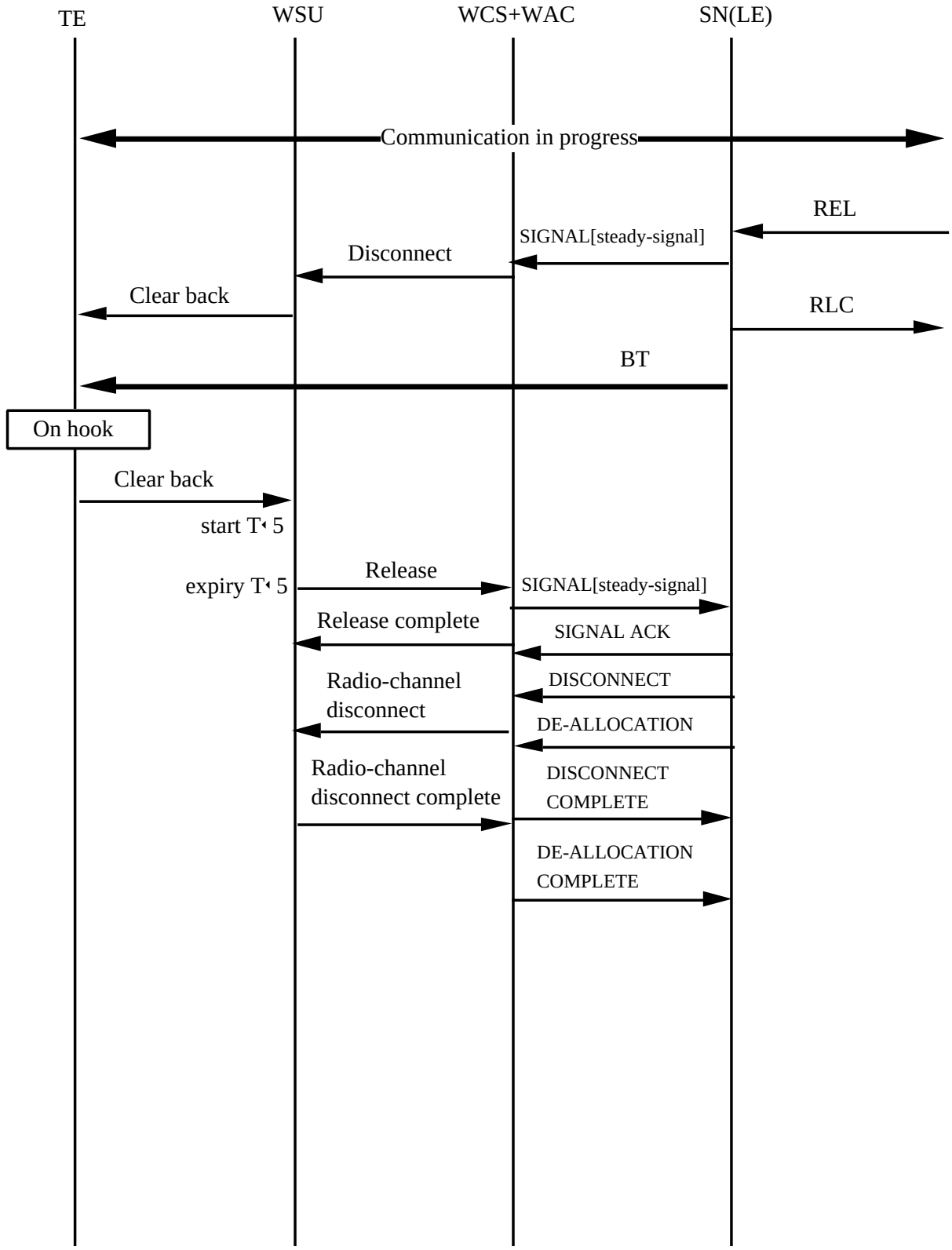


Figure A2-2/C-NW1.00(3/3) Terminating Call (PSTN-Release)

A2.3 Hooking Signal Transmission Procedure

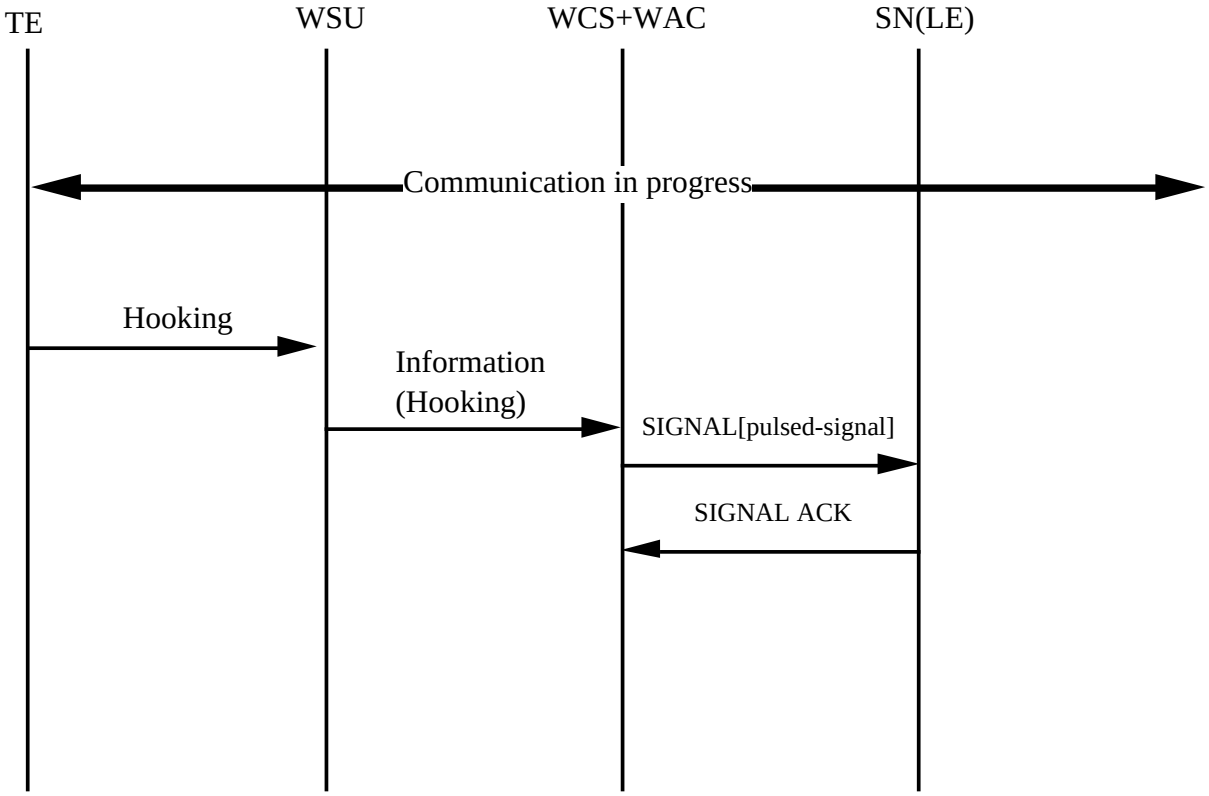


Figure A2-3/C-NW1.00 Hooking Signal Transmission Procedure

A2.4 DTMF Signal Transmission Procedure

See section A1.4.

A2.5 Direct Dialling In Procedure

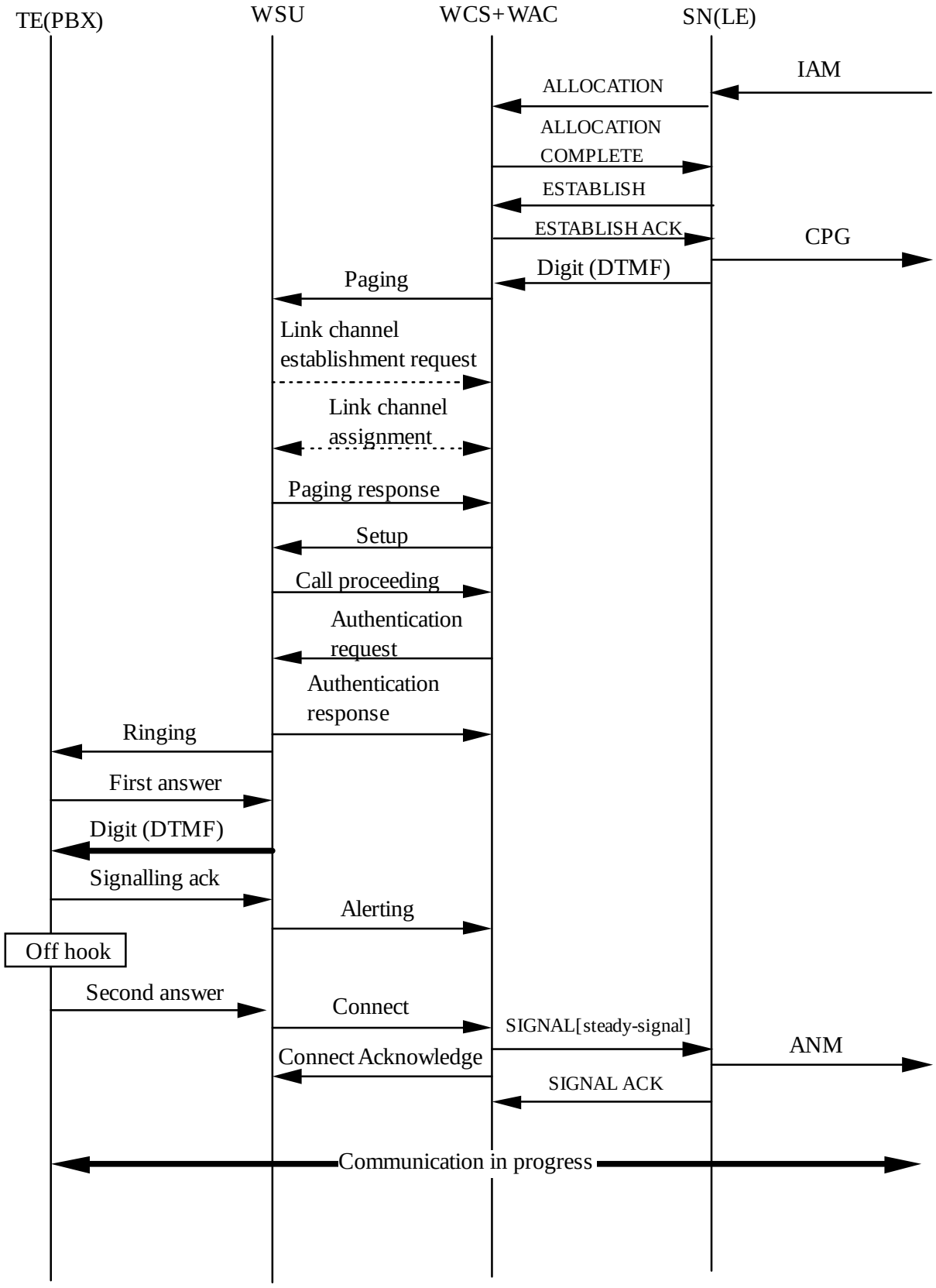


Figure A2-5/C-NW1.00(1/2) Direct Dialling In Procedure (for NTT)

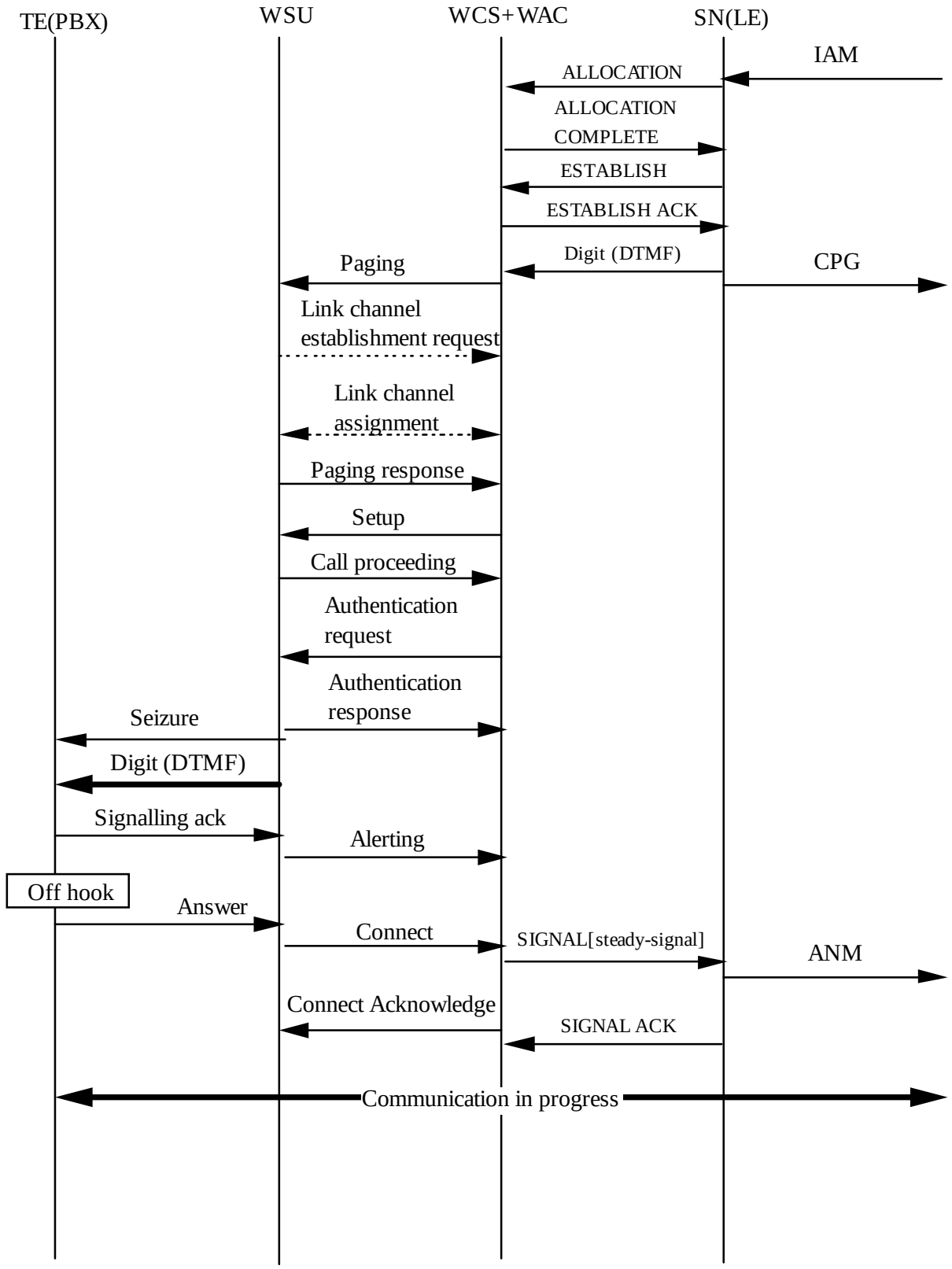
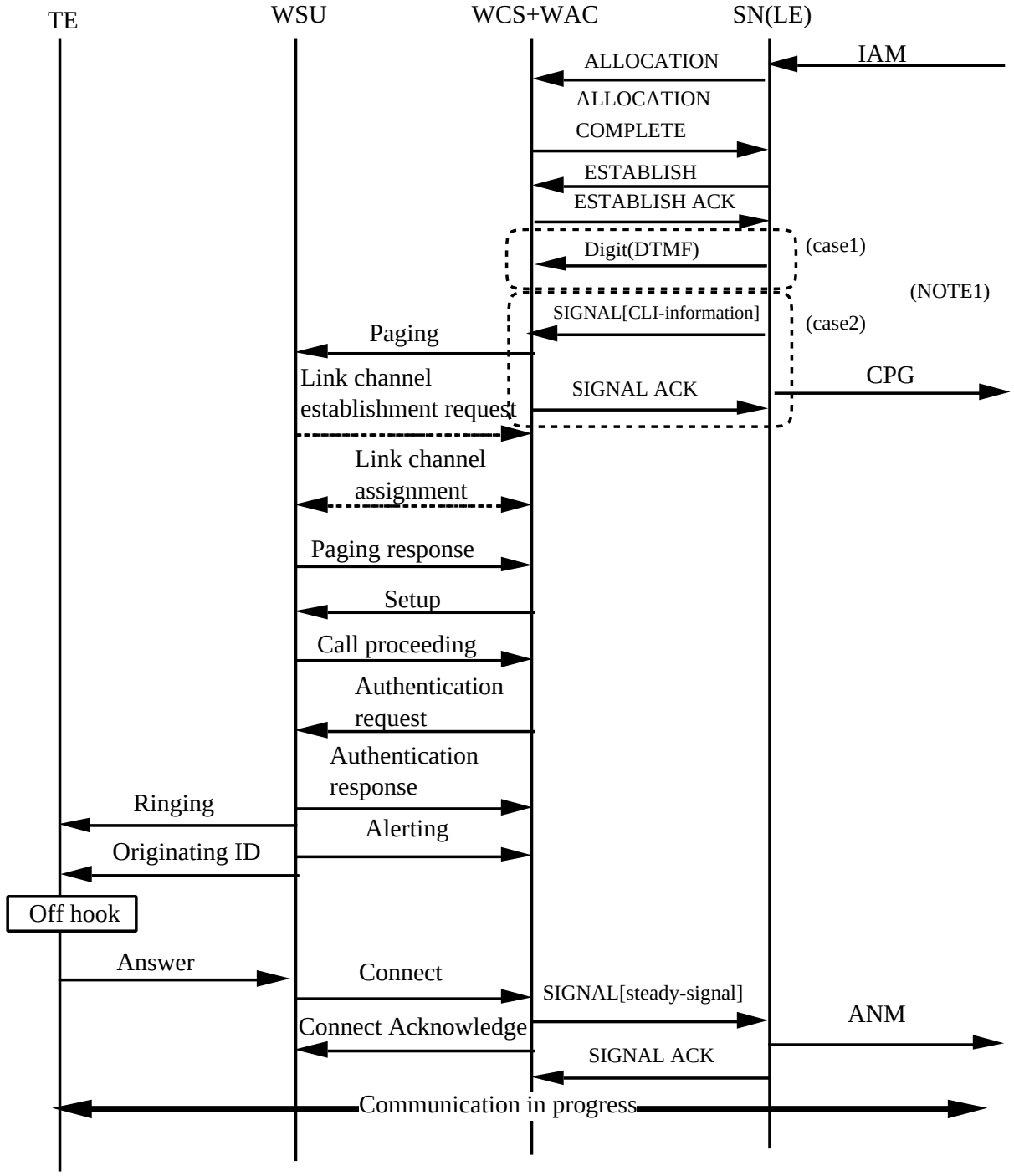


Figure A2-5/C-NW1.00(2/2) Direct Dialling In Procedure (DTMF DDI)

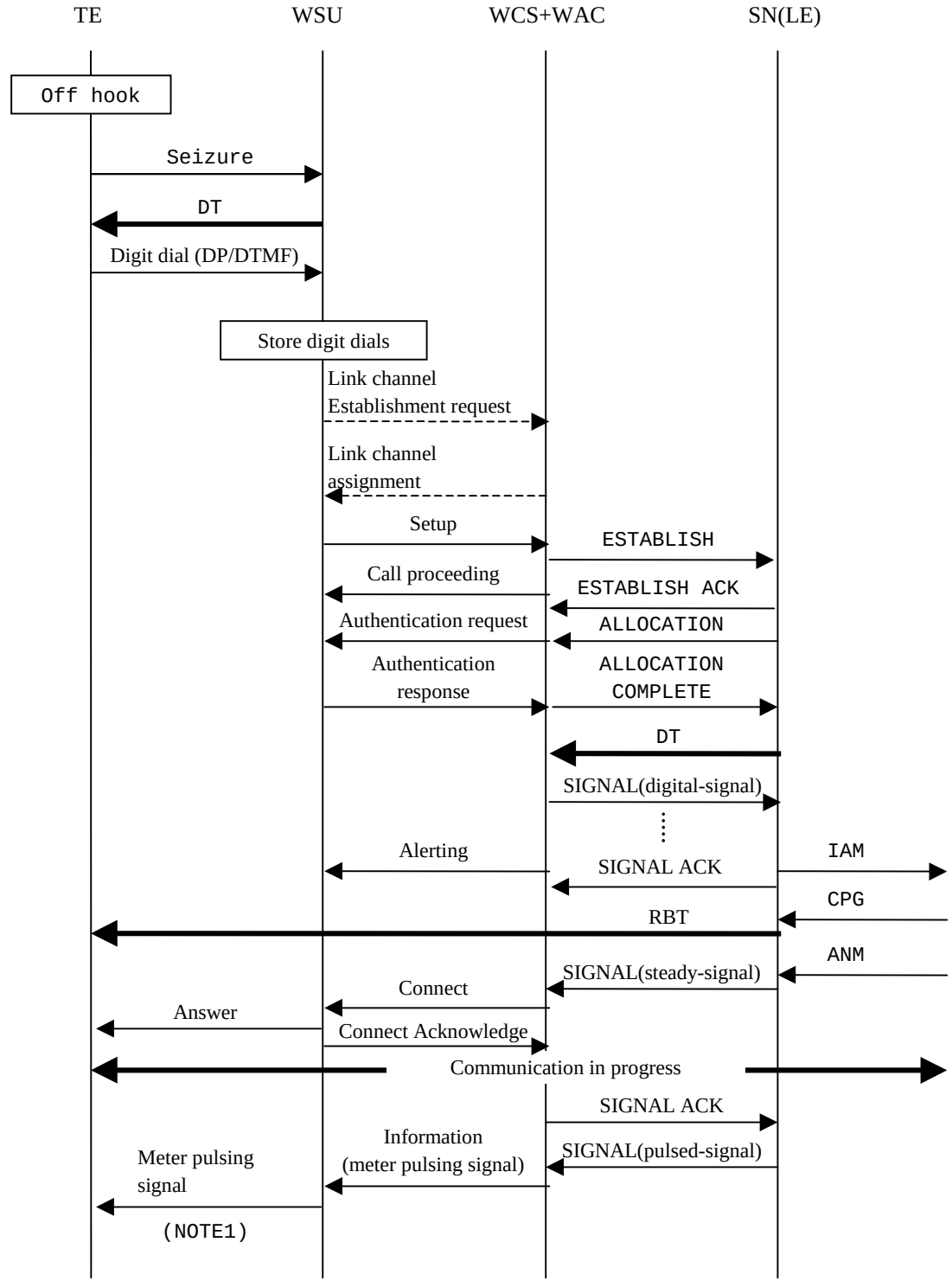
A2.6 Calling Line Identification Presentation Procedure



NOTE1: case1:DTMF will be used in some SNs.
case2:SIGNAL[CLI-information] message will be used in some SNs.

Figure A2-6/C-NW1.00 Calling Line Identification Presentation Procedure

A2.7 Meter Pulsing Signal Delivery Procedure

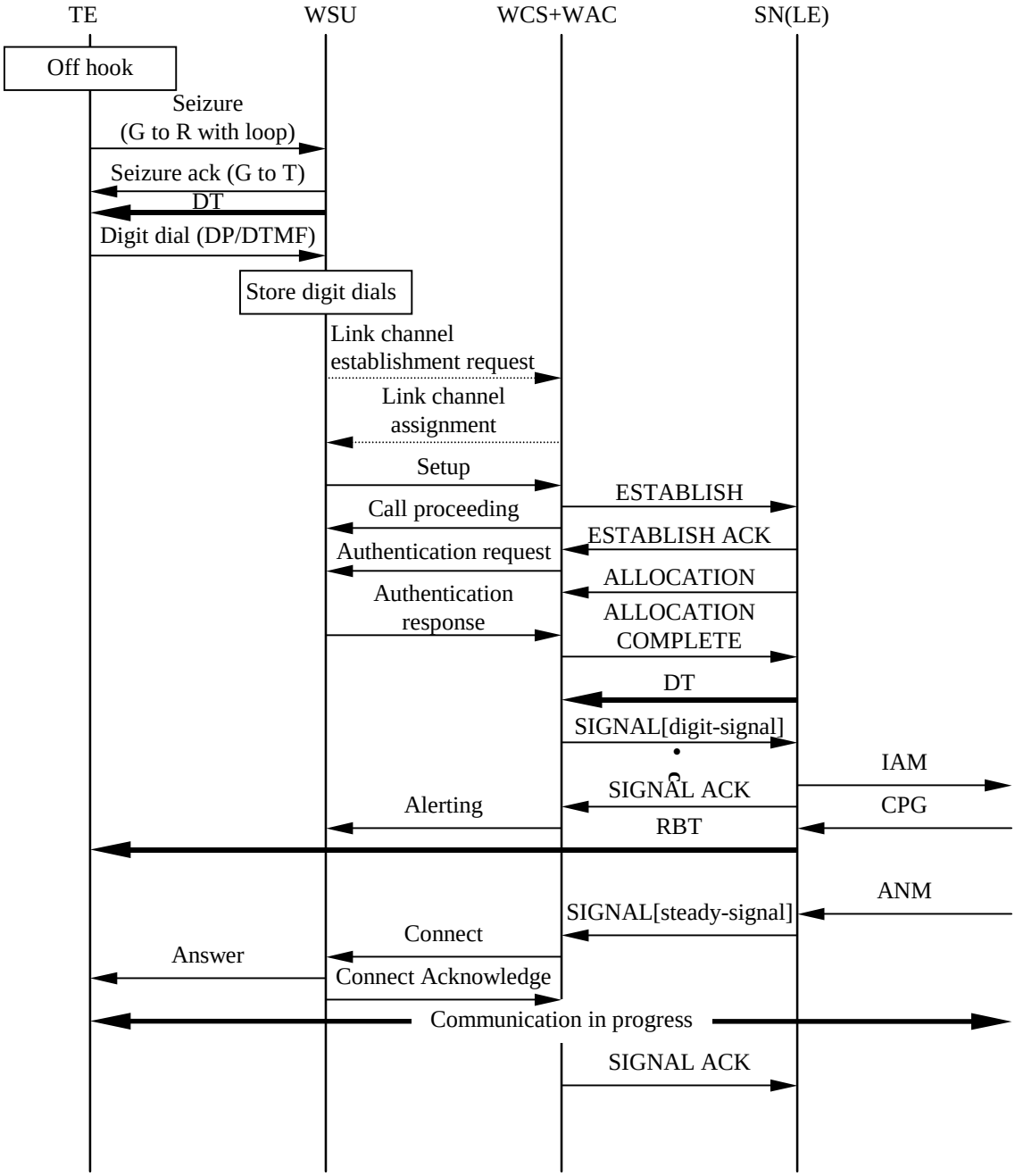


NOTE1: In some countries, this meter pulsing signal has a response signal, and the detail specification is specified by the operators of these countries.

NOTE2: This example is indicated based on digit signal and en bloc sending sequence.

Figure A2-7/C-NW1.00 Meter Pulsing Signal Delivery Procedure

A2.8 Ground Start PBX Procedure

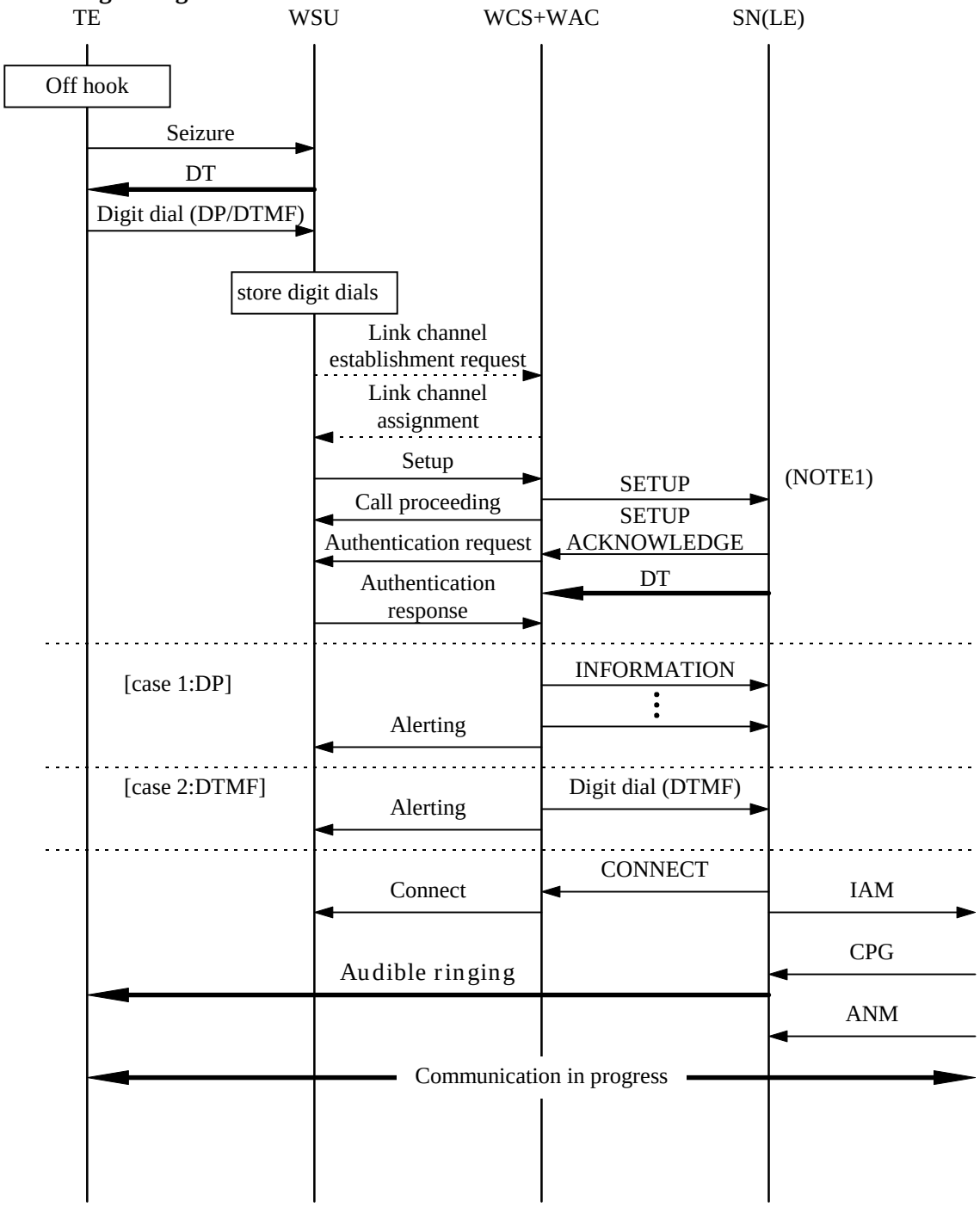


NOTE1: This example is indicated based on digit signal and en bloc sending sequence.

Figure A2-8/C-NW1.00 Ground Start PBX Procedure

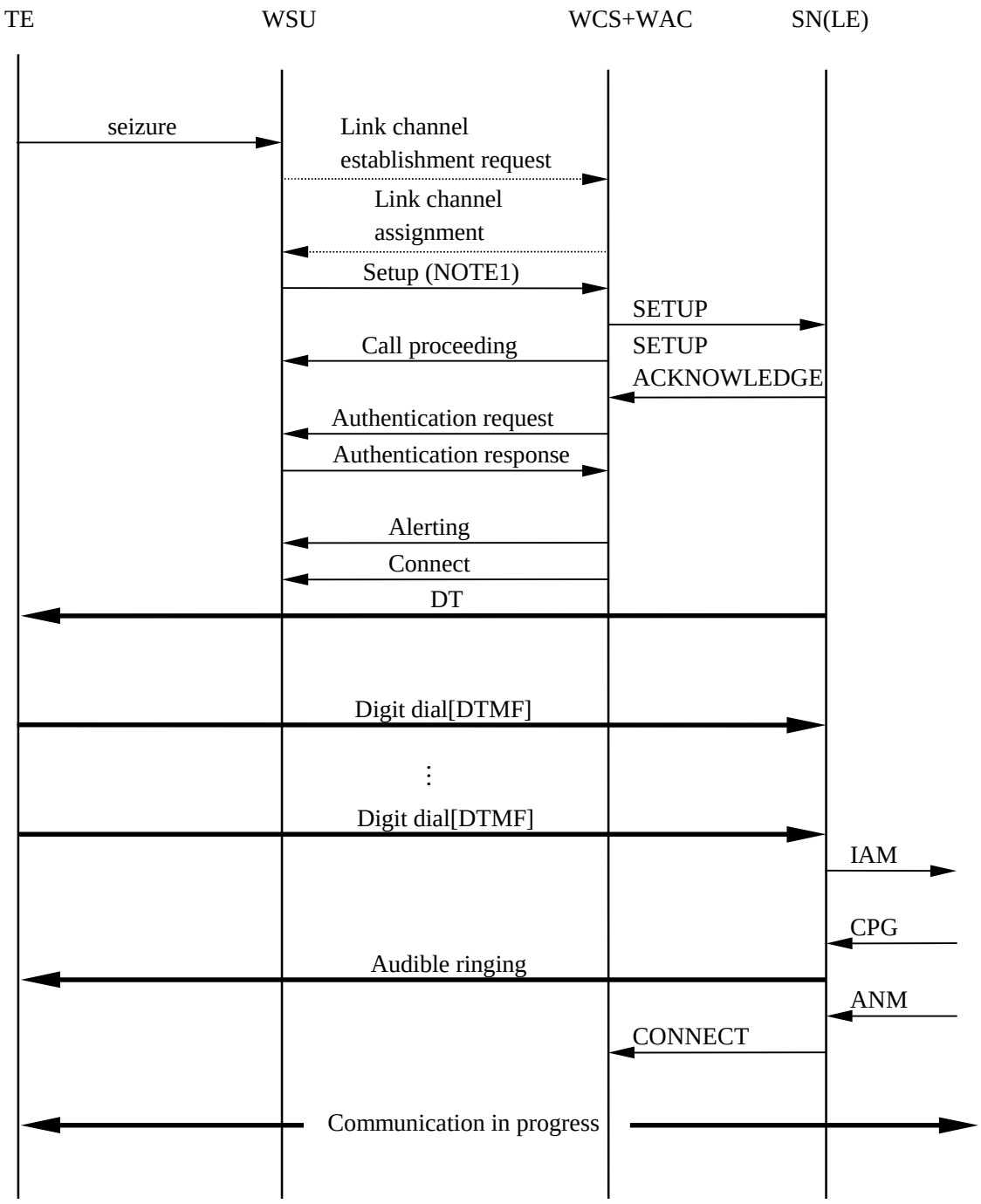
A.3 Bellcore GR-303-CORE Interface

A3.1 Originating Call



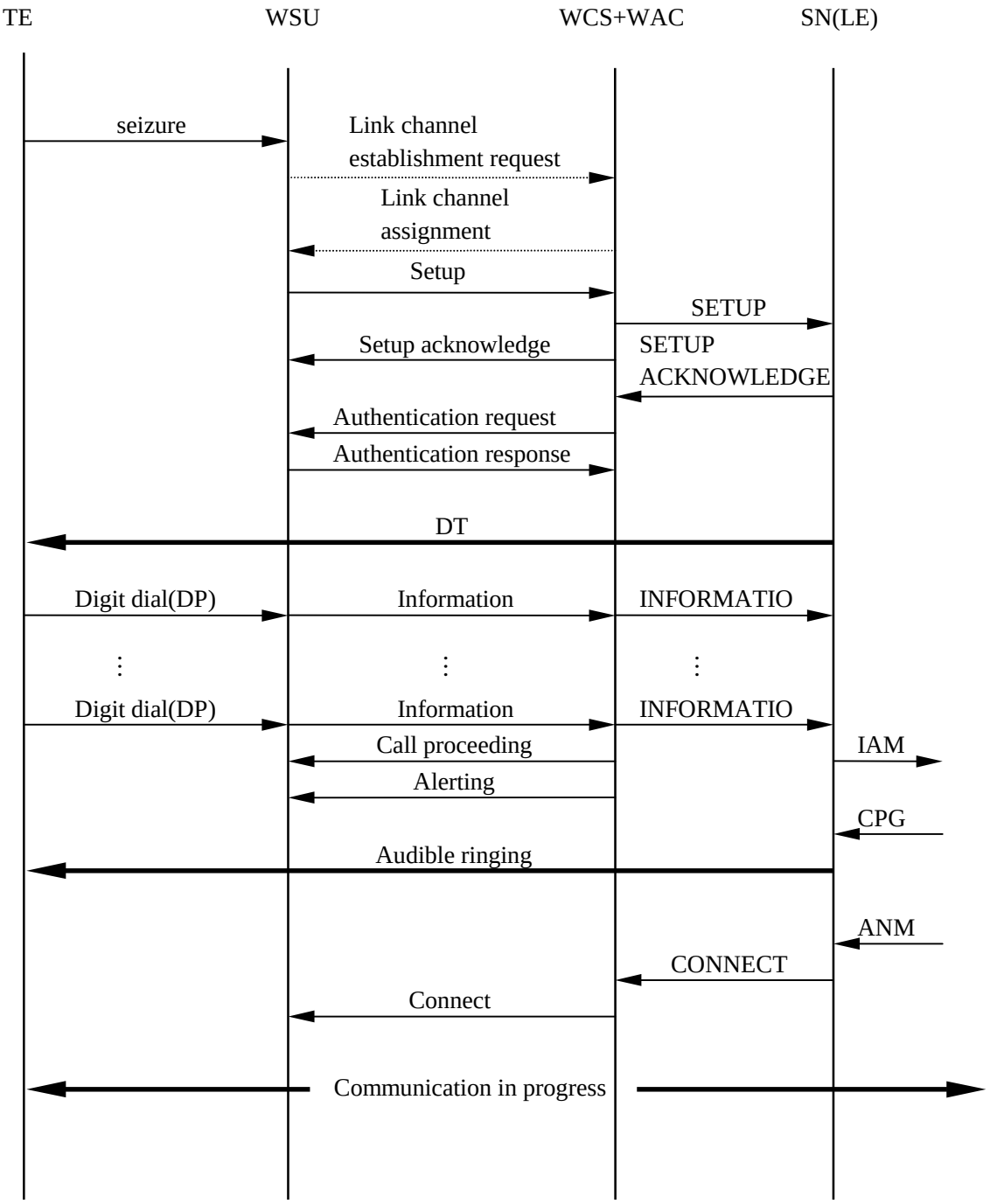
NOTE1: After receipt of Setup message, the sequence following SETUP message is independent from authentication procedure.

Figure A3-1/C-NW1.00(1/6) Originating Call (CASE1: en bloc sending)



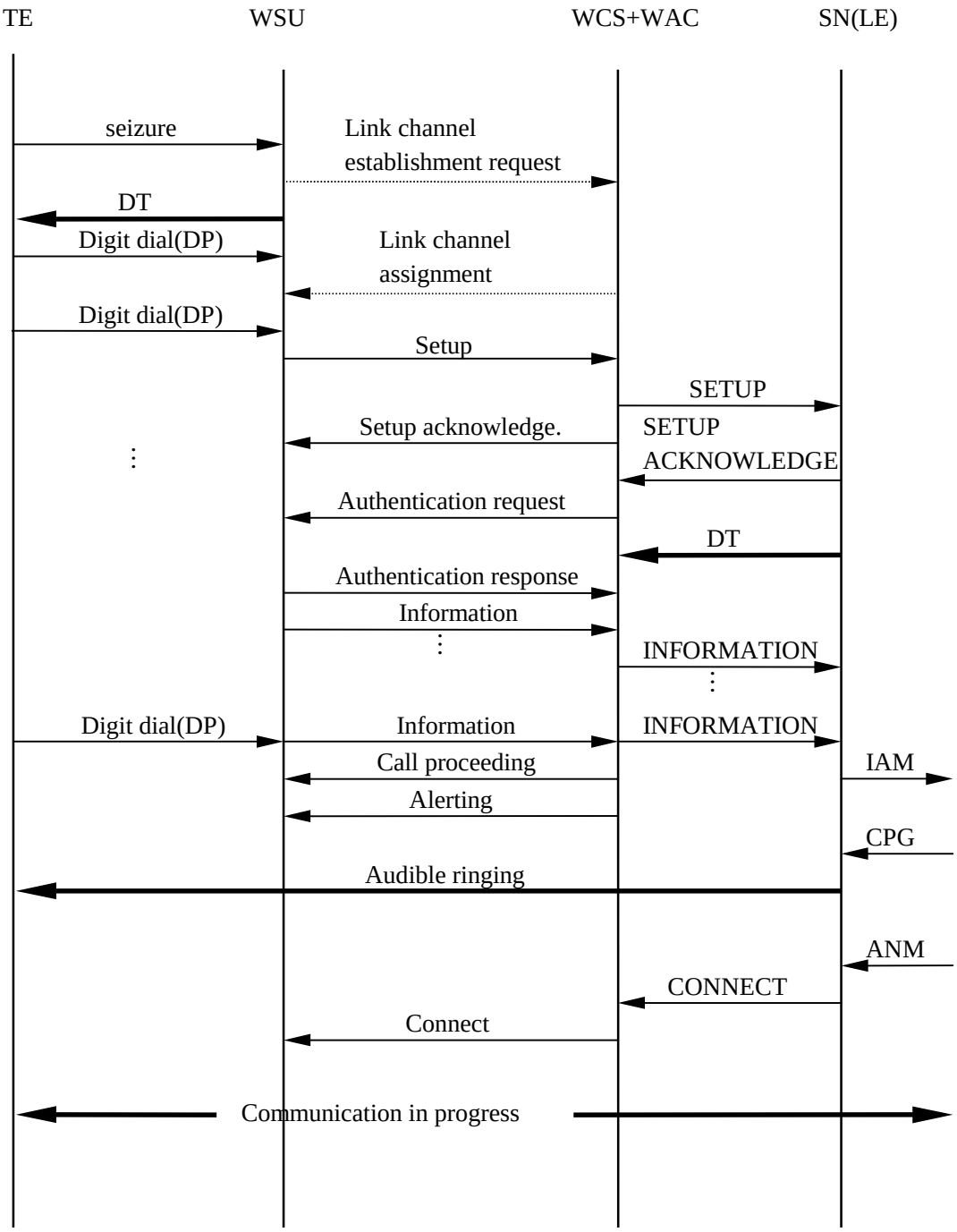
NOTE1: In this SETUP message, Called Number is not included.

Figure A3-1/C-NW1.00(2/6) Originating Call (CASE2: Overlap sending-type1)



Note1: This example is indicated based on digit signal.

Figure A3-1/C-NW1.00(3/6) Originating Call (CASE2: Overlap sending-Type2)



Note1: This example is indicated based on digit signal.

Figure A3-1/C-NW1.00(4/6) Originating Call (CASE2: Overlap sending-Type3)

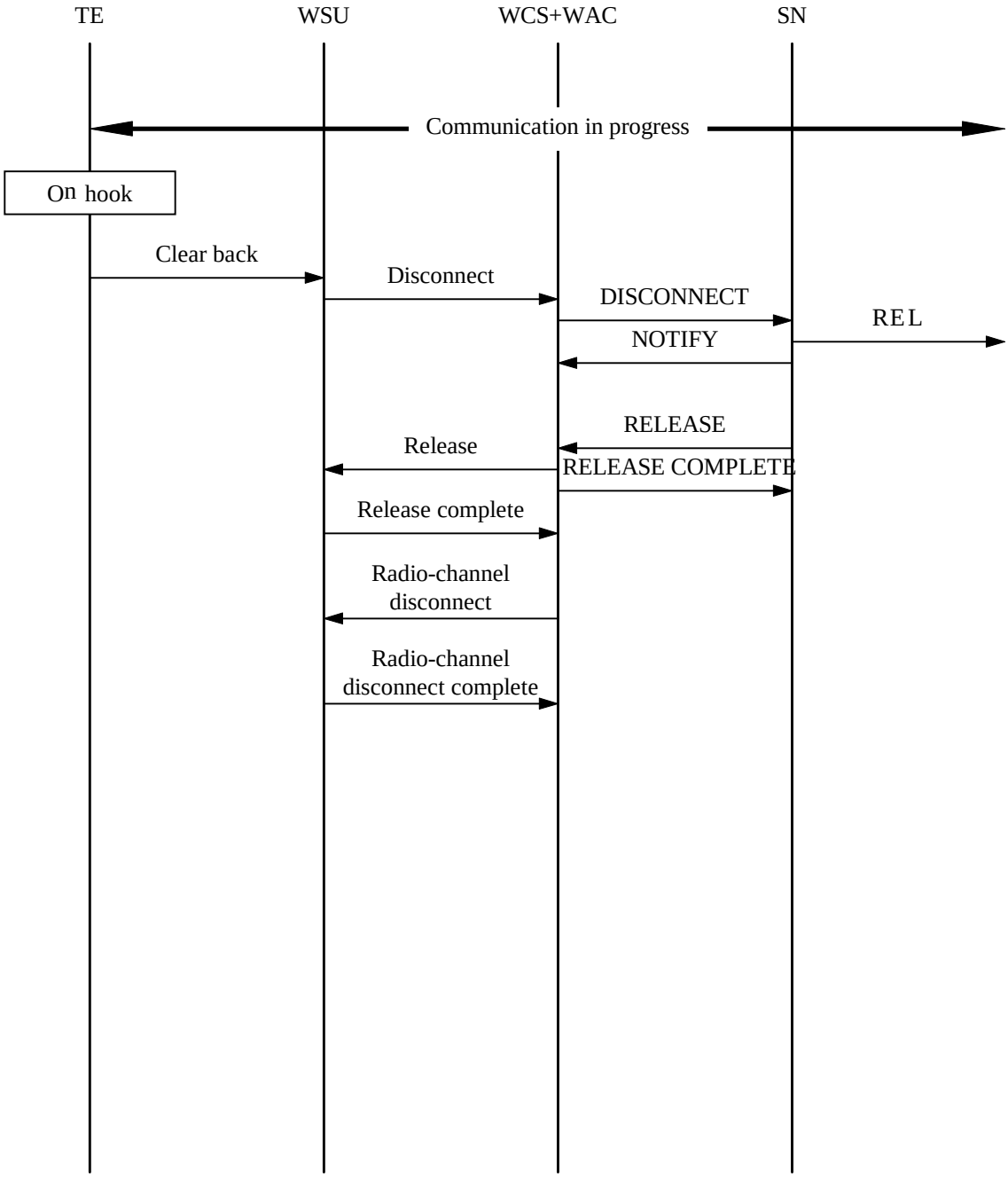


Figure A3-1/C-NW1.00(5/6) Originating Call (FWA Release)

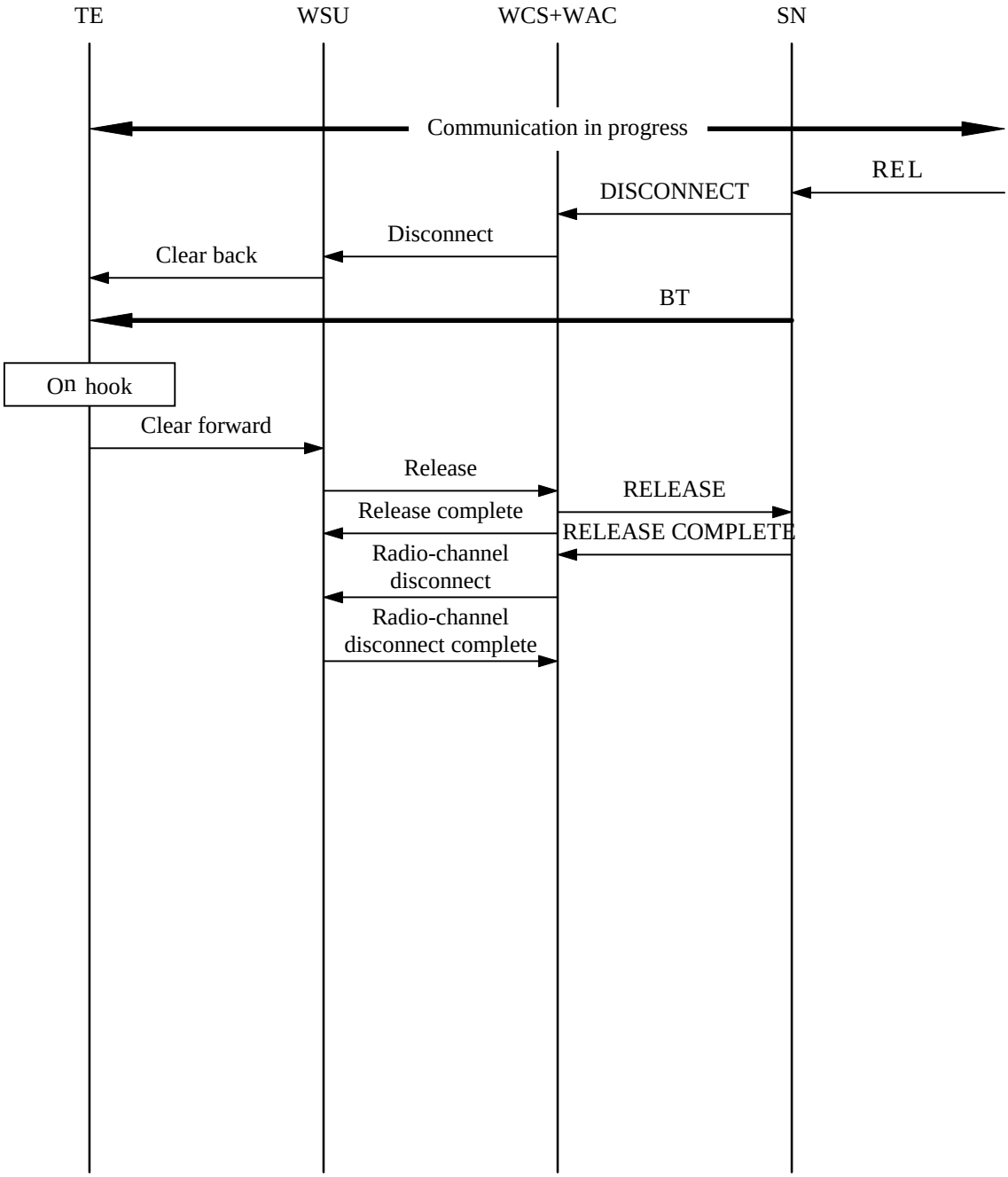


Figure A3-1/C-NW(6/6) Originating Call (PSTN - Release)

A3.2 Terminating Call

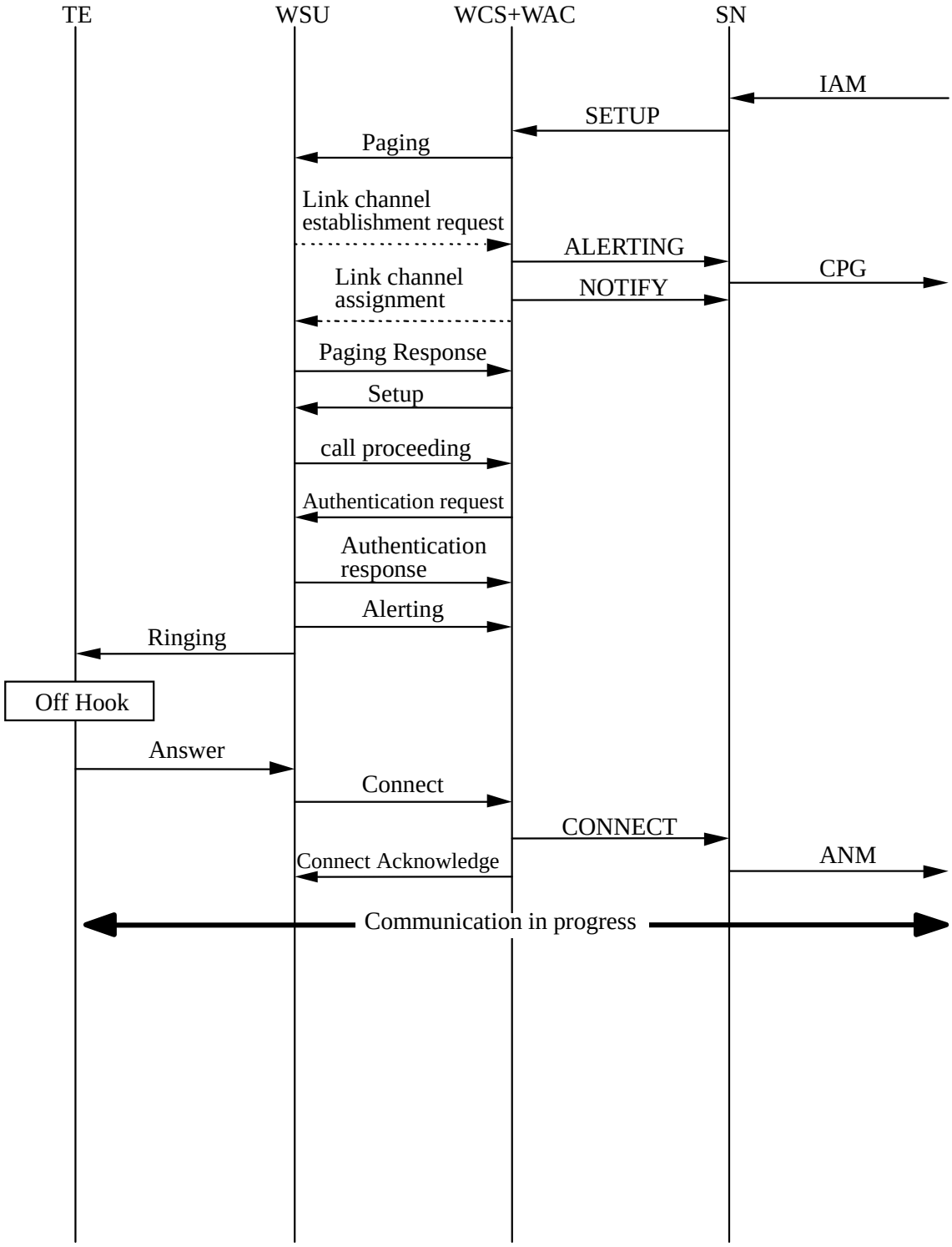


Figure A3-2/C-NW1.00(1/3) Terminating Call

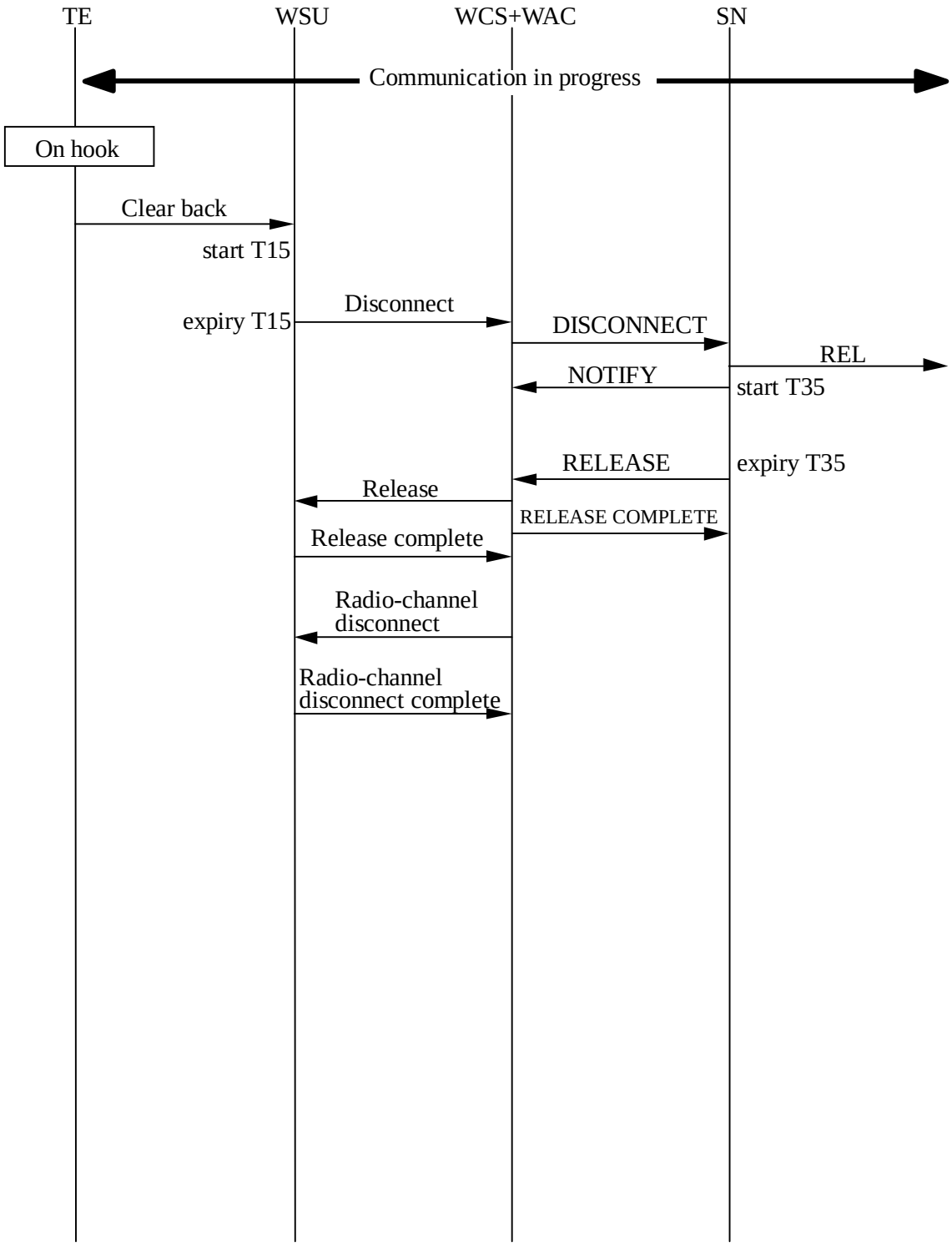


Figure A3-2/C-NW1.00(2/3) Terminating Call (FWA-Release)

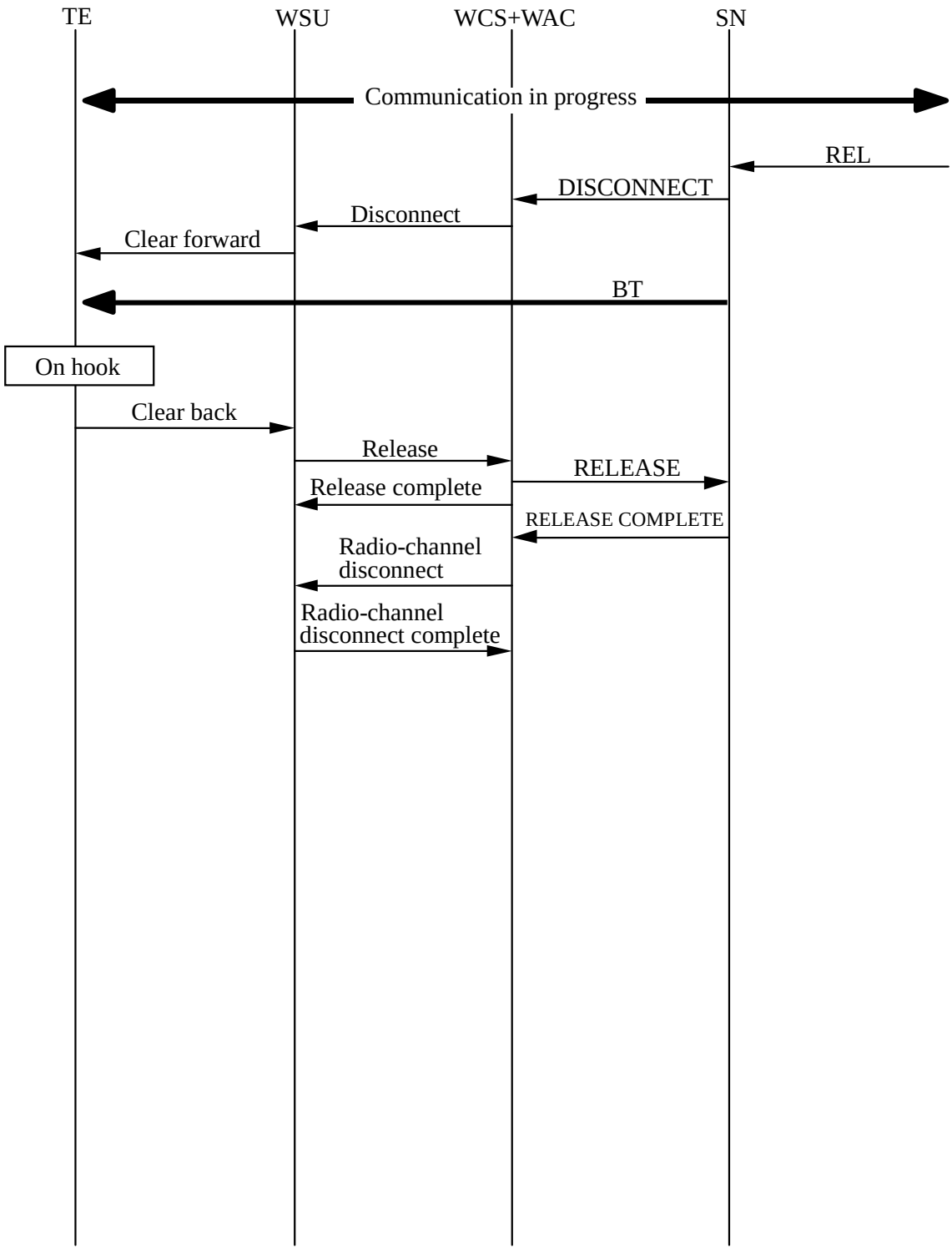


Figure A3-2/C-NW1.00(3/3) Terminating Call (PSTN-Release)

A3.3 Hooking Signal Transmission Procedure

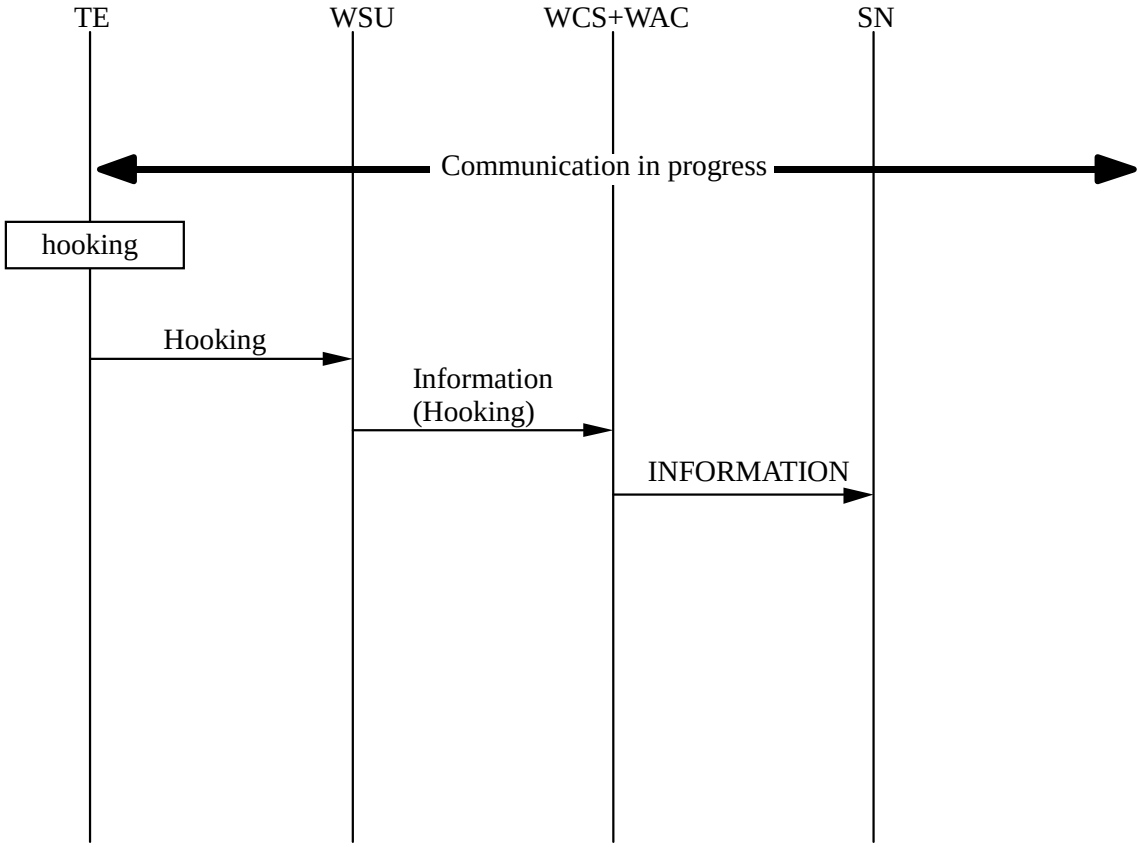


Figure A3-3/C-NW1.00 Hooking Signal Transmission Procedure

A3.4 DTMF Signal Transmission Procedure

See section A1.4.

A3.5 Direct Dialling In Procedure

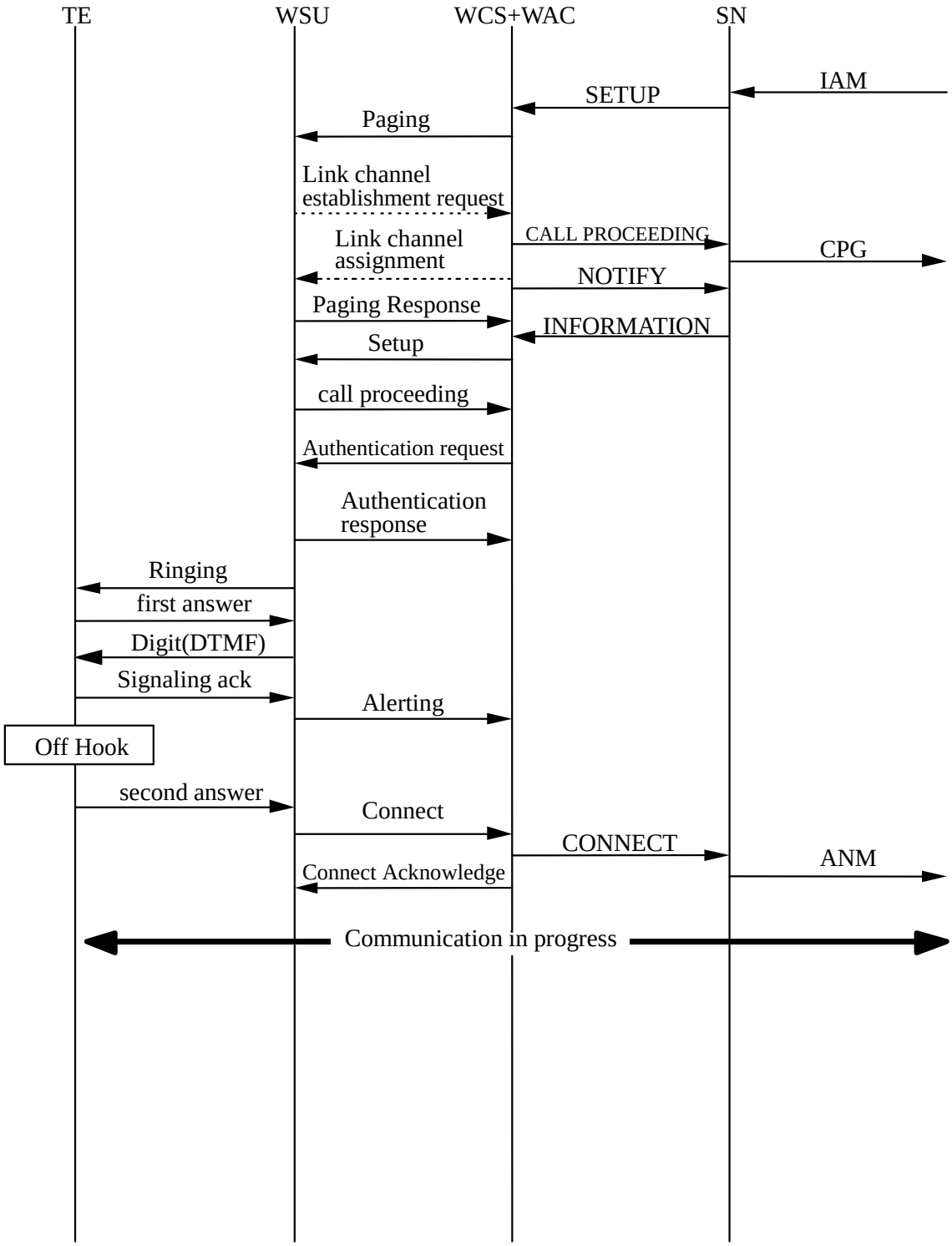


Figure A3-5/C-NW1.00(1/2) Direct Dialling In Procedure (for NTT)

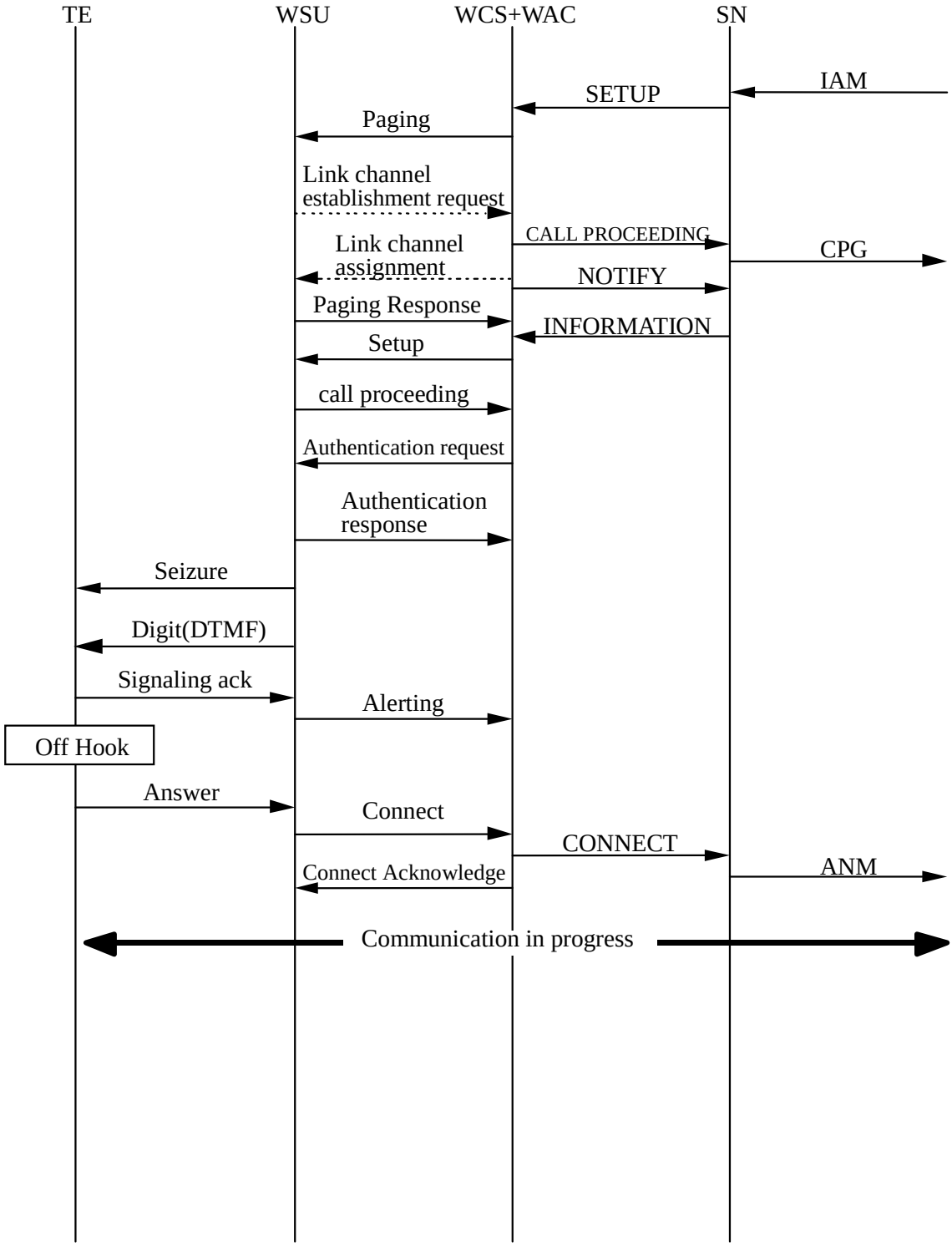


Figure A3-5/C-NW1.00(2/2) Direct Dialling In Procedure (for DTMF DDI)

A3.6 Calling Line Identification Presentation Procedure

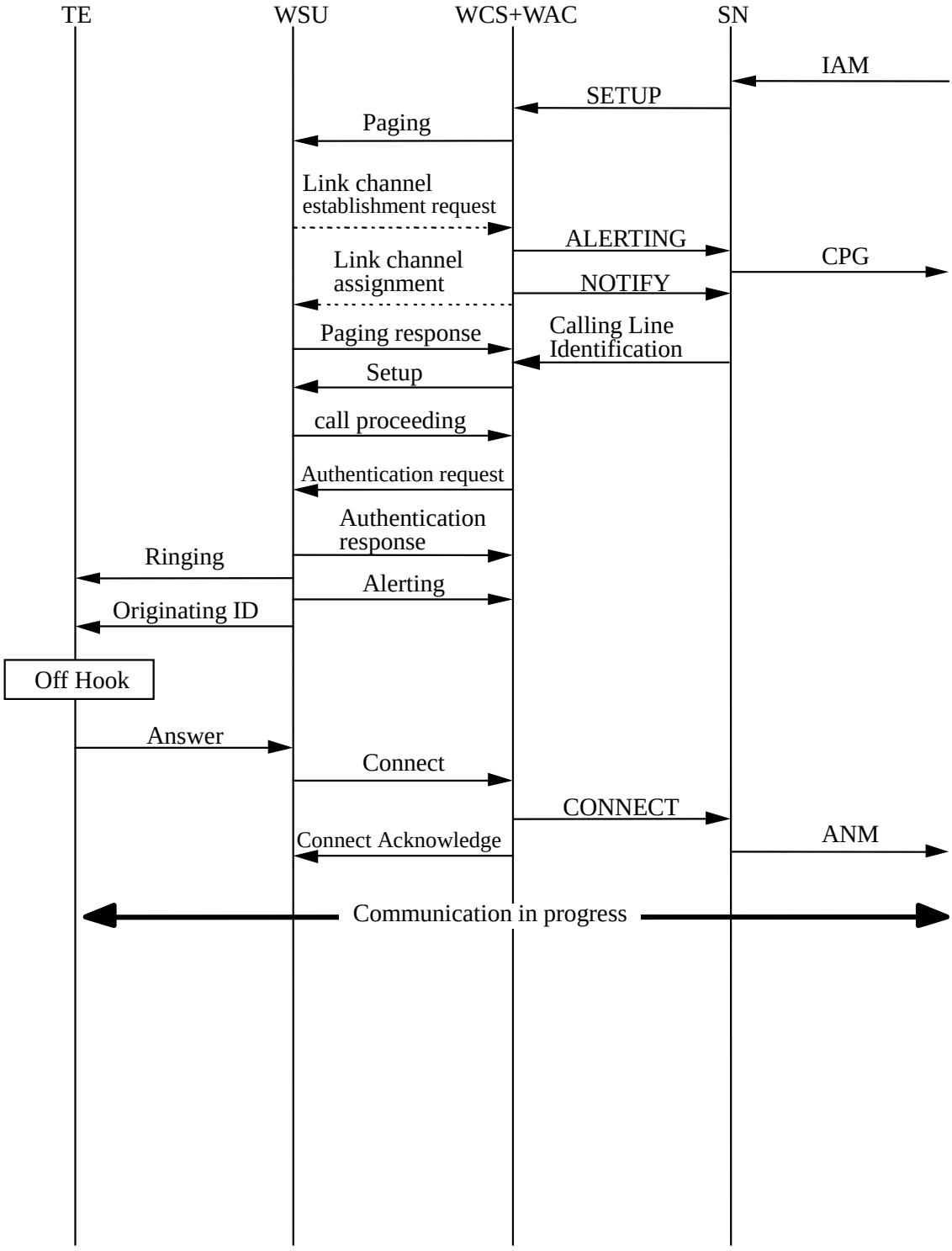
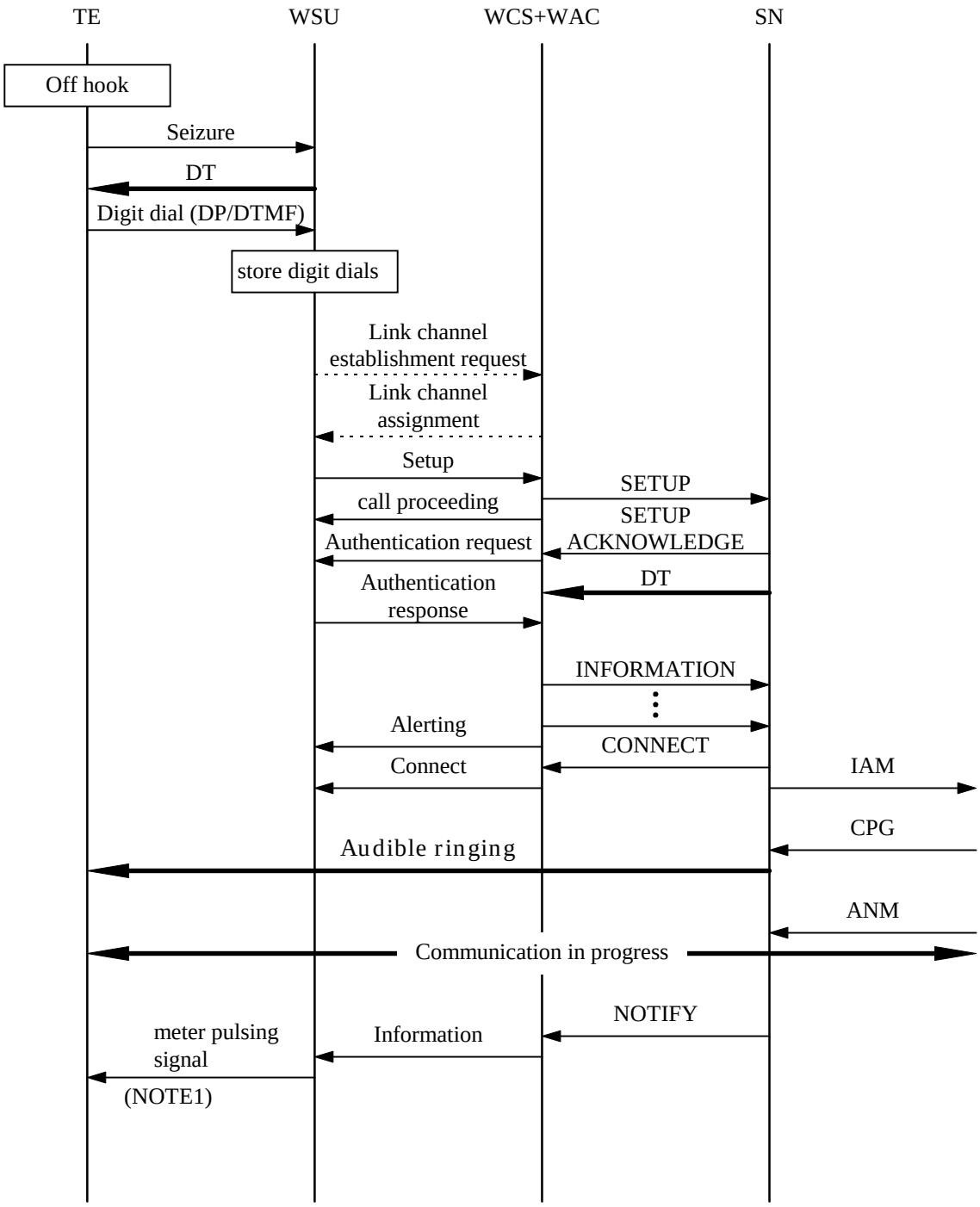


Figure A3-6/C-NW1.00 Calling Line Identification Presentation Procedure

A3.7 Meter Pulsing Signal Delivery Procedure

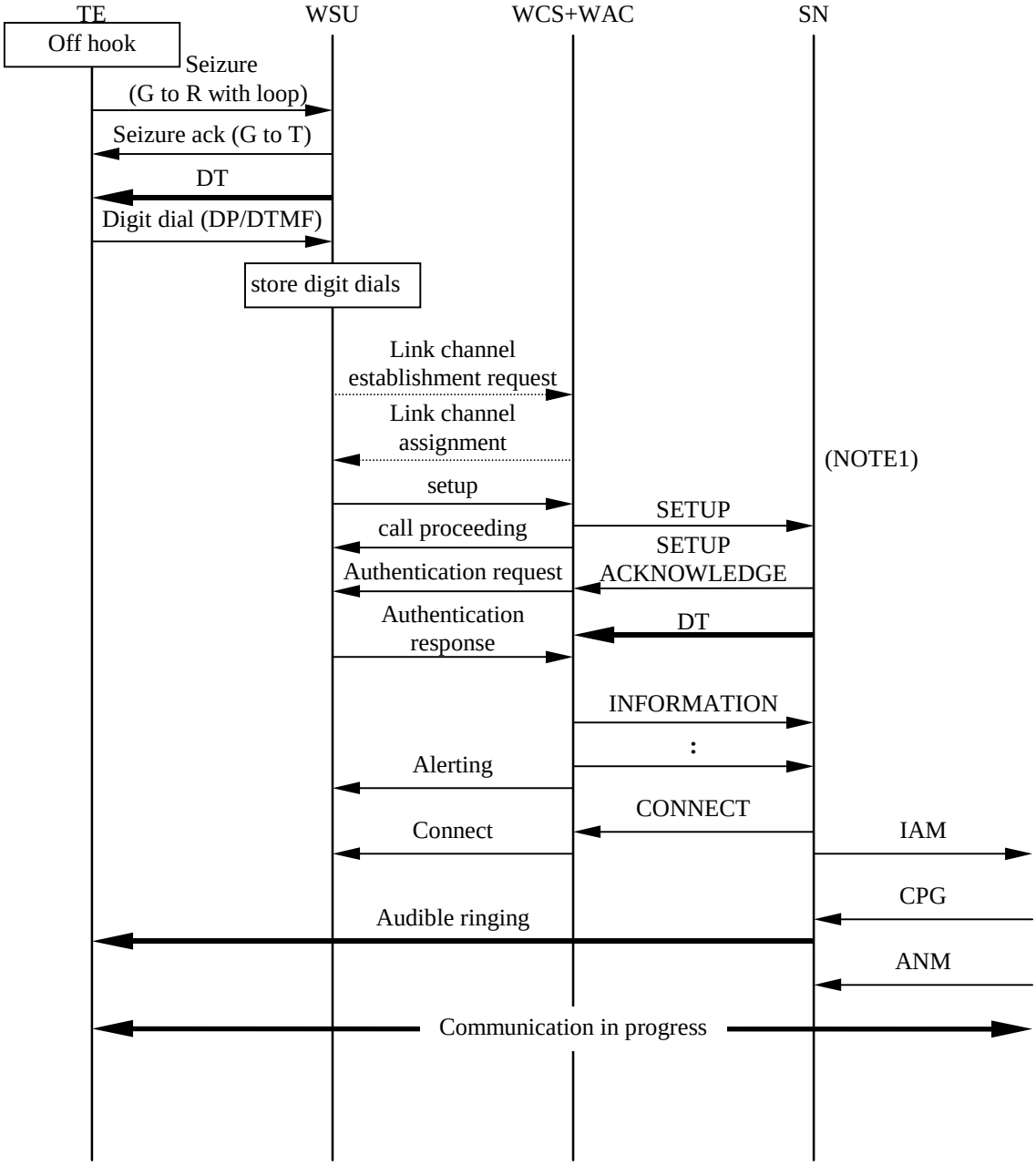


NOTE1: In some countries, this meter pulsing signal has a response signal, and the detail specification is specified by operators of these countries.

NOTE2: This example is indicated based on digit dial and en bloc sending sequence.

Figure A3-7/C-NW1.00 Meter Pulsing Signal Delivery Procedure

A3.8 Ground Start PBX Procedure



NOTE1: This example is indicated based on digit signal and en bloc sending procedure

Figure A3-8/C-NW1.00 Ground start PBX Procedure