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TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

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**DIGITAL SUBSCRIBER SIGNALLING  
SYSTEM No. 1**

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**INTEGRATED SERVICES DIGITAL NETWORK  
(ISDN) – STAGE 3 SERVICE DESCRIPTION  
FOR CHARGING SUPPLEMENTARY  
SERVICES USING DSS 1**

**Clause 2 – Advice Of Charge (AOC)**

**ITU-T Recommendation Q.956**

(Previously “CCITT Recommendation”)

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## FOREWORD

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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation Q.956, clause 2, was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 17th of October 1995.

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## NOTE

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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## **SUMMARY**

This Recommendation defines the operation of the Digital Subscriber Signalling System No. 1 (DSS 1) for the support of the Advice Of Charge (AOC) Supplementary service at the T or the coincident S and T reference point of the User-to-Network Interface of the Integrated Services Digital Network (ISDN).

The Advice Of Charge supplementary service allows the served user to request the network to provide charging information at call establishment time (AOC-S), during the call (AOC-D), or at the end of the call (AOC-E). Depending on the subscribed options, this charging information may be provided either for all calls or only for the calls for which an explicit request is made.

**INTEGRATED SERVICES DIGITAL NETWORK (ISDN) –  
STAGE 3 SERVICE DESCRIPTION FOR  
CHARGING SUPPLEMENTARY SERVICES USING DSS 1**

*(Geneva, 1995)*

## **2 Advice Of Charge (AOC)**

### **2.1 Scope**

This Recommendation specifies the stage three of the Advice of Charge (AOC) supplementary service for the Integrated Services Digital Network (ISDN) at the T reference point or coincident S and T reference point (as defined in Recommendation I.411 [1]) by means of the Digital Subscriber Signalling System No. 1 (DSS 1). Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see Recommendation I.130 [2]).

In addition, this Recommendation specifies the protocol requirements at the T reference point where the service is provided to the user via a private ISDN.

This Recommendation does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not an ISDN.

The AOC supplementary service allows the served user to be informed of usage-based charging information. The AOC supplementary service is not meant to replace the charge metering inside the network which is considered to be correct in all cases.

Three AOC supplementary services exist:

a) *Charging information at call set-up time (AOC-S)*

The AOC-S supplementary service enables a user to receive information about the charging rates at call set-up time and also to receive further information during the call if there is a change of charging rates.

b) *Charging information during the call (AOC-D)*

The AOC-D supplementary service enables a user to receive information on the recorded charges for a call during the active phase of the call.

c) *Charging information at the end of the call (AOC-E)*

The AOC-E supplementary service enables a user to receive information on the recorded charges for a call when the call is terminated.

The AOC supplementary service is applicable to all circuit-switched telecommunication services.

Further part(s) of this Recommendation shall specify the method of testing required to identify conformance to this Recommendation.

This Recommendation is applicable to equipment, supporting the AOC supplementary service, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

### **2.2 References**

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation I.411 (1993), *ISDN user-network interfaces – Reference configurations*.

[2] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.

- [3] ITU-T Recommendation I.112 (1993), *Vocabulary of terms for ISDNs*.
- [4] ITU-T Recommendation Q.931 (1993), *Digital subscriber Signalling System No. 1 (DSS 1) – ISDN user-network interface layer 3 specification for basic call control*.
- [5] ITU-T Recommendation Q.932 (1993), *Digital subscriber Signalling System No. 1 (DSS 1) – Generic procedures for the control of ISDN supplementary services*.
- [6] CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1)*.
- [7] CCITT Recommendation X.219 (1988), *Remote operations: Model, notation and service definition*.
- [8] ITU-T Recommendation Q.952 (1993), *Stage 3 service description for call offering supplementary services using DSS 1 – Diversion supplementary services*.
- [9] ITU-T Recommendation Z.100 (1993), *CCITT specification and description language (SDL)*.

## 2.3 Definitions

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

**2.3.1 service; telecommunications service:** See 2.2/I.112 [3], definition 201.

**2.3.2 served user:** The served user is the user of a particular ISDN number, who is requesting that charging information should be provided (for all calls or on request).

**2.3.3 basic communication:** This charged item indicates the rate to be applied for the connection to the called user.

**2.3.4 call control message:** A message as defined in 3.1/Q.931 [4] which on sending or receipt causes a change of the call state at either the network or the user.

**2.3.5 call attempt:** This charged item indicates the cost applied for a call which has been sent to the called user, but the called user has not yet answered the call.

**2.3.6 call set-up:** This charged item indicates the cost applied for the connection to the called user when the called user answers the call.

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

**2.3.8 special charging arrangement:** This charged item indicates that a special charging arrangement exists for calculating the cost of the call.

NOTE – The use of this charged item is outside the scope of this Recommendation. It is a matter for the network operator and the user to which it is sent.

**2.3.9 user-to-user information transfer:** This charged item indicates the rate to be applied to the transfer of user-to-user information.

**2.3.10 billing identification:** Elements for billing identification informs the served user that the associated charges have been incurred due to the indicated situation (e.g. a call that has been forwarded at the served user's access).

**2.3.11 recorded charges:** This information indicates the number of charging units or currency units incurred for a call.

**2.3.12 flat rate:** This specific rate indicates a fixed currency value per event.

**2.3.13 special charging code:** This specific code indicates a rate which can identify a charging algorithm that can be used as a basis for determining the cost of a call.

**2.3.14 charging information:** Information sent to a user in an invoke component or a return result component showing charging-related information (i.e. either charging rate information, special charging rates, or the recorded charges for the call). The invoke, return result and return error components are defined in Recommendation Q.932 [5].

**2.3.15 special service or operation of supplementary services:** This charged item indicates the cost applied for a special service or for the operation of requested supplementary services.

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

**2.3.17 local interaction for the call:** The local interaction exists on a single call, i.e. both supplementary services are invoked for the same call.

## **2.4 Abbreviations**

For the purposes of this Recommendation, the following abbreviations are used:

AOC	Advice Of Charge
AOC-S	AOC at call set-up time
AOC-D	AOC during the call
AOC-E	AOC at the end of the call
ASN.1	Abstract Syntax Notation One
DSS 1	Digital Subscriber Signalling System No. 1
ISDN	Integrated Services Digital Network
PSTN	Public Switched Telephone Network

## **2.5 Description**

Depending on subscription by the served user, charging information for any of the three services may be provided either:

- for all calls; or
- for any call, after a user request to provide charging information.

The charging information given shall relate to the charges incurred on the network to which the user is attached.

Charging information for applications using higher layer protocols which are not defined as teleservices, shall be based on the bearer services specified.

### **2.5.1 Charging information at call set-up time**

When the AOC-S supplementary service is activated, the network shall provide the user with information about the charging rates at call establishment. In addition, the network shall inform the served user if a change in charging rates takes place during the call.

The network shall provide the charging information during call establishment or at the latest at call connection. When there is a change in the charging rate during the call, the network shall send information about the new charging rate to the served user.

### **2.5.2 Charging information during a call**

When the AOC-D supplementary service is activated, the network shall provide the user with charging information for a call during the active phase of a call. The network shall provide the charging information and transfer it to the served user in an appropriate message. The supplied charging information shall be provided as a cumulative charge incurred so far for the call (i.e. charges recorded from the start of the call and until the moment the charging information is sent to the served user).

When the call is released, the network shall send the recorded charges for the call to the served user in one of the call control messages clearing the call.

If a call is free of charge to the served user, the network shall send the free-of-charge indication in the first message sent to the served user. The network shall not send any further charging information during the call. When the call is released, the network shall send the charged amount (zero) in a call control message clearing the call.

### **2.5.3 Charging information at the end of a call**

When the AOC-E supplementary service is activated, the network shall provide the served user with charging information indicating the recorded charges for a call when the call is released. The network shall send the charging information to the served user in one of the call control messages clearing the call.

## 2.6 Operational requirements

### 2.6.1 Provision/withdrawal

These supplementary services shall be provided separately by arrangement with the service provider or be generally available. Withdrawal of the service shall be made at subscriber request or for administrative reasons.

The following subscription options exist for each of the three AOC supplementary services, as defined in Table 2-1.

TABLE 2-1/Q.956

#### Advice of charge subscription options

Subscription options	Value
Provision of service	1) For all calls; or 2) On request on a per call basis

### 2.6.2 Requirements on the originating network side

The originating network side shall make available the type of charging information that is indicated, related to a certain call.

The originating network side shall assemble the appropriate charging information, according to the service requirements, and send it to the user.

NOTE – The charging information may either be generated at the originating network, or generated elsewhere and sent to the originating network, in due time for the information to be provided to the user according to the procedures of this Recommendation.

The network shall only include a charged item if the charged item contains information concerning the charges applied to that call.

The network shall only use those charged items which are appropriate to that network charging mechanism. Thus, in some networks, the network may, but need not, send some of these items or combinations of items. Different networks could give information about the same call in different ways.

If the served user suspends a call, then as a network option the originating network side shall retain the charging information for the suspended call as long as the network retains the call identity of the served user's suspended call.

### 2.6.3 Requirements on the destination network side

None identified.

## 2.7 Coding requirements

### 2.7.1 General

The charging information that the network shall convey to the served user may consist of a number of information units. The information to be transferred is specified in the Stage 1 service descriptions.

### 2.7.2 Coding of the Facility information element

Table 2-2 shows the definition of the operations and errors required for the AOC supplementary service using Abstract Syntax Notation One (ASN.1) as defined in Recommendation X.208 [6] and using the OPERATION and ERROR macro as defined in Figure 4/X.219 of X.219 [7].

TABLE 2-2/Q.956

## ASN.1 description of AOC information

Advice-of-Charge-Operations { ccitt recommendation q 956 advice-of-charge (2) operations-and-errors (1) }	
DEFINITIONS IMPLICIT TAGS ::=	
BEGIN	
IMPORTS	<b>OPERATION, ERROR</b> <b>FROM Remote-Operation-Notation</b> { joint-iso-ccitt remote-operations(4)notation(0) }  userNotSubscribed, notAvailable, invalidCallState, supplementaryServiceInteractionNotAllowed <b>FROM General-Error-List</b> { ccitt recommendation q 950 general-error-list (1) }  PartyNumber <b>FROM Addressing-Data-Elements</b> { ccitt recommendation q 932 addressing-data-elements (7) };
EXPORTS	ChargingRequest, AOCSCurrency, AOCSSpecialArr, AOCDCurrency, AOCDChargingUnit, AOCECurrency, AOCEChargingUnit, NoChargingInfoAvailable, IdentificationOfCharge;
ChargingRequest ::=	<b>OPERATION</b>
ARGUMENT	ChargingCase
RESULT CHOICE	{ AOCSCurrencyInfoList, AOCSSpecialArrInfo, chargingInfoFollows NULL }
ERRORS	{ userNotSubscribed, notAvailable, invalidCallState, NoChargingInfoAvailable }
AOCSCurrency ::=	<b>OPERATION</b> -- AOC-S given in currency units
ARGUMENT CHOICE	{ chargeNotAvailable NULL, AOCSCurrencyInfoList }
AOCSSpecialArr ::=	<b>OPERATION</b> -- AOC-S for special charging arrangement
ARGUMENT CHOICE	{ chargeNotAvailable NULL, AOCSSpecialArrInfo }
AOCDCurrency ::=	<b>OPERATION</b> -- AOC-D given in currency units
ARGUMENT CHOICE	{ chargeNotAvailable NULL, AOCDCurrencyInfo }
AOCDChargingUnit ::=	<b>OPERATION</b> -- AOC-D given in charging units
ARGUMENT CHOICE	{ chargeNotAvailable NULL, AOCDChargingUnitInfo }
AOCECurrency ::=	<b>OPERATION</b> -- AOC-E given in currency units
ARGUMENT CHOICE	{ chargeNotAvailable NULL, AOCECurrencyInfo }
AOCEChargingUnit ::=	<b>OPERATION</b> -- AOC-E given in charging units
ARGUMENT CHOICE	{ chargeNotAvailable NULL, AOCEChargingUnitInfo }
IdentificationOfCharge ::=	<b>OPERATION</b>
ARGUMENT	ChargingAssociation
ERRORS	{ userNotSubscribed, notAvailable, supplementaryServiceInteractionNotAllowed }
ChargingCase ::=	<b>ENUMERATED</b> { chargingInformationAtCallSetup (0), chargingDuringACall (1), chargingAtTheEndOfACall (2) }
AOCSCurrencyInfoList ::=	<b>SEQUENCE SIZE (1..10) OF AOCSCurrencyInfo</b>

TABLE 2-2/Q.956 (continued)

ASN.1 description of AOC information

<b>AOCSCurrencyInfo ::=</b>	<b>SEQUENCE</b> { <b>chargedItem</b> <b>ChargedItem</b> , <b>CHOICE</b> { <b>specificCurrency</b> <b>CHOICE</b> { <b>durationCurrency</b> [1] <b>DurationCurrency</b> , <b>flatRateCurrency</b> [2] <b>FlatRateCurrency</b> , <b>volumeRateCurrency</b> [3] <b>VolumeRateCurrency</b> }, <b>specialChargingCode</b> <b>SpecialChargingCode</b> , <b>freeOfCharge</b> [4] <b>NULL</b> , <b>currencyInfoNotAvailable</b> [5] <b>NULL</b> } }
<b>AOCSSpecialArrInfo ::=</b>	<b>INTEGER</b> (1..10)
<b>ChargedItem ::=</b>	<b>ENUMERATED</b> { <b>basicCommunication</b> (0), <b>callAttempt</b> (1), <b>callSetup</b> (2), <b>userToUserInfo</b> (3), <b>operationOfSupplementaryServ</b> (4) }
<b>DurationCurrency ::=</b>	<b>SEQUENCE</b> { <b>dCurrency</b> [1] <b>Currency</b> , <b>dAmount</b> [2] <b>Amount</b> , <b>dChargingType</b> [3] <b>ChargingType</b> , <b>dTime</b> [4] <b>Time</b> , <b>dGranularity</b> [5] <b>Time OPTIONAL</b> }
<b>FlatRateCurrency ::=</b>	<b>SEQUENCE</b> { <b>fRCurrency</b> [1] <b>Currency</b> , <b>fRAmount</b> [2] <b>Amount</b> }
<b>VolumeRateCurrency ::=</b>	<b>SEQUENCE</b> { <b>vRCurrency</b> [1] <b>Currency</b> , <b>vRAmount</b> [2] <b>Amount</b> , <b>vRVolumeUnit</b> [3] <b>VolumeUnit</b> }
<b>SpecialChargingCode ::=</b>	<b>INTEGER</b> (1..10)
<b>AOCDCurrencyInfo ::=</b>	<b>CHOICE</b> { <b>specificCurrency</b> <b>SEQUENCE</b> { <b>recordedCurrency</b> [1] <b>RecordedCurrency</b> , <b>typeOfChargingInfo</b> [2] <b>TypeOfChargingInfo</b> , <b>aOCDBillingId</b> [3] <b>AOCDBillingId OPTIONAL</b> }, <b>freeOfCharge</b> [1] <b>NULL</b> }
<b>AOCDChargingUnitInfo ::=</b>	<b>CHOICE</b> { <b>specificChargingUnits</b> <b>SEQUENCE</b> { <b>recordedUnitsList</b> [1] <b>RecordedUnitsList</b> , <b>typeOfChargingInfo</b> [2] <b>TypeOfChargingInfo</b> , <b>aOCDBillingId</b> [3] <b>AOCDBillingId OPTIONAL</b> }, <b>freeOfCharge</b> [1] <b>NULL</b> }
<b>RecordedCurrency ::=</b>	<b>SEQUENCE</b> { <b>rCurrency</b> [1] <b>Currency</b> , <b>rAmount</b> [2] <b>Amount</b> }
<b>RecordedUnitsList ::=</b>	<b>SEQUENCE SIZE</b> (1..32) <b>OF</b> <b>RecordedUnits</b>
<b>TypeOfChargingInfo ::=</b>	<b>ENUMERATED</b> { <b>subTotal</b> (0), <b>total</b> (1) }
<b>RecordedUnits ::=</b>	<b>SEQUENCE</b> { <b>CHOICE</b> { <b>recordedNumberOfUnits</b> <b>NumberOfUnits</b> , <b>notAvailable</b> <b>NULL</b> }, <b>recordedTypeOfUnits</b> <b>TypeOfUnit OPTIONAL</b> }
<b>AOCDBillingId ::=</b>	<b>ENUMERATED</b> { <b>normalCharging</b> (0), <b>reverseCharging</b> (1), <b>creditCardCharging</b> (2) }

TABLE 2-2/Q.956 (continued)

ASN.1 description of AOC information

AOCECurrencyInfo ::=	SEQUENCE { CHOICE { specificCurrency recordedCurrency aOCEBillingId freeOfCharge chargingAssociation	SEQUENCE { [1] RecordedCurrency, [2] AOCEBillingId OPTIONAL}, [1] NULL }, ChargingAssociation OPTIONAL}
AOCEChargingUnitInfo ::=	SEQUENCE { CHOICE { specificChargingUnits recordedUnitsList aOCEBillingId freeOfCharge chargingAssociation	SEQUENCE { [1] RecordedUnitsList, [2] AOCEBillingId OPTIONAL}, [1] NULL }, ChargingAssociation OPTIONAL}
AOCEBillingId ::=	ENUMERATED { normalCharging reverseCharging creditCardCharging callForwardingUnconditional callForwardingBusy callForwardingNoReply callDeflection callTransfer	(0), (1), (2), (3), (4), (5), (6), (7) }
ChargingAssociation ::=	CHOICE { chargedNumber chargeIdentifier	[0] EXPLICIT PartyNumber, ChargeIdentifier}
ChargeIdentifier ::=	INTEGER (0..16777215)	
Currency ::=	IA5String (SIZE (1..10))	
Amount ::=	SEQUENCE { currencyAmount multiplier	[1] CurrencyAmount, [2] Multiplier }
CurrencyAmount ::=	INTEGER (0..16777215)	
Multiplier ::=	ENUMERATED { oneThousandth (0), oneHundredth (1), oneTenth (2), one (3), ten (4), hundred (5), thousand (6) }	
Time ::=	SEQUENCE { lengthOfTimeUnit scale	[1] LengthOfTimeUnit, [2] Scale }
LengthOfTimeUnit ::=	INTEGER (0..16777215)	
Scale ::=	ENUMERATED { oneHundredthSecond (0), oneTenthSecond (1), oneSecond (2), tenSeconds (3), oneMinute (4), oneHour (5), twentyFourHours (6) }	
VolumeUnit ::=	ENUMERATED { octet (0), segment (1), message (2) }	
TypeOfUnit ::=	INTEGER (1..16)	
NumberOfUnits ::=	INTEGER (0..16777215)	
ChargingType ::=	ENUMERATED { continuousCharging (0), stepFunction (1) }	
NoChargingInfoAvailable ::=	ERROR	
noChargingInfoAvailable	NoChargingInfoAvailable ::=	localValue 26
chargingRequest	ChargingRequest ::=	localValue 30
aOCSCurrency	AOCSCurrency ::=	localValue 31

TABLE 2-2/Q.956 (concluded)

**ASN.1 description of AOC information**

<b>aOCSSpecialArr</b>	<b>AOCSSpecialArr ::=</b>	<b>localValue</b>	<b>32</b>
<b>aOCDCurrency</b>	<b>AOCDCurrency ::=</b>	<b>localValue</b>	<b>33</b>
<b>aOCDChargingUnit</b>	<b>AOCDChargingUnit ::=</b>	<b>localValue</b>	<b>34</b>
<b>aOCECurrency</b>	<b>AOCECurrency ::=</b>	<b>localValue</b>	<b>35</b>
<b>aOCEChargingUnit</b>	<b>AOCEChargingUnit ::=</b>	<b>localValue</b>	<b>36</b>
<b>identificationOfCharge</b>	<b>IdentificationOfCharge ::=</b>	<b>localValue</b>	<b>37</b>
<b>END</b>	<i>-- of Advice of Charge operations</i>		

## 2.8 State definitions

The following states have been defined for the user:

**AOC Request:** The user has sent an AOC request to the network and is waiting for a response (see Note).

**AOC Active:** An AOC supplementary service has been activated by a user on a per call basis (see Note).

The following states have been defined for the network side:

**AOC Idle:** An AOC supplementary service is not activated.

**AOC-S Activated:** The AOC-S supplementary service has been activated either on a per call basis or for all calls.

**AOC-D Activated:** The AOC-D supplementary service has been activated either on a per call basis or for all calls.

**AOC-E Activated:** The AOC-E supplementary service has been activated either on a per call basis or for all calls.

**AOC-S Idle:** The network has sent the AOC-S charging information to the served user. This is a “waiting” condition where either a change in the charging rate, or the suspension of the basic call occurs, or the call is cleared.

**AOC-S Suspended:** The AOC-S supplementary service is activated, and the served user has invoked the terminal portability supplementary service for this call.

**AOC-D Suspended:** The AOC-D supplementary service is activated, and the served user has invoked the terminal portability supplementary service for this call.

**AOC-E Suspended:** The AOC-E supplementary service is activated, and the served user has invoked the terminal portability supplementary service for this call.

NOTE – These states exist for each instance of the AOC supplementary service.

## 2.9 Signalling procedures at the coincident S and T reference point

### 2.9.1 Activation/deactivation/registration

#### 2.9.1.1 Normal operation

These supplementary services may be activated on a per call basis or they may be active for all calls. The activation on a per call basis is only active for the lifetime of that call.

If an AOC supplementary service is subscribed to for all calls, no signalling procedure is defined for the activation of the service. The network shall automatically activate the subscribed AOC supplementary service at each call set-up.

To activate an AOC supplementary service, the user shall include in the SETUP message a Facility information element containing a ChargingRequest invoke component. The ChargingRequest invoke component shall indicate the AOC supplementary service to be activated. Each AOC supplementary service is activated independently and one, two, or three activations can thus occur in the same SETUP message.

If the network activates the requested AOC supplementary service (e.g. the served user is allowed to request the information), the network shall acknowledge the request by returning a ChargingRequest return result component within a Facility information element in a call control message (i.e. SETUP ACKNOWLEDGE, CALL PROCEEDING, PROGRESS, ALERTING, or CONNECT message – whichever is appropriate). Alternatively, the network can use a FACILITY message to convey the ChargingRequest return result component if a call control message is not available when the information is to be sent.

If a user has requested the AOC-S supplementary service and the activation request is accepted by the network, the procedure of 2.9.2.1.1 shall be followed.

If a user has requested the AOC-D or AOC-E supplementary services and the activation request is accepted by the network, the network shall send a ChargingRequest return result component to the user indicating “chargingInfoFollows”.

If the user receives a correctly encoded ChargingRequest return result component, the user shall accept the provided information and shall not respond to the network.

No signalling procedure is defined for the registration of an AOC supplementary service.

### **2.9.1.2 Exceptional procedures**

The following exceptional procedures shall apply:

- a) if the AOC supplementary service is activated for all calls and the network cannot provide the charging information, the network shall, at the time it determines that the information is not available, send a Facility information element including an AOCSCurrency, AOCSSpecialArr, AOCDCurrency, AOCDChargingUnit, AOCECurrency or AOCEChargingUnit invoke component indicating “chargeNotAvailable” to the user and continue normal call handling;
- b) if the user receives a correctly encoded AOCSCurrency, AOCSSpecialArr, AOCDCurrency, AOCDChargingUnit, AOCECurrency or AOCEChargingUnit invoke component, the user shall accept the provided information and shall not respond to the network;
- c) if the AOC supplementary service is requested on a per call basis and the network cannot provide the charging information, the network shall include the Facility information element containing a ChargingRequest return error component in a call control or FACILITY message and continue the basic call. The ChargingRequest return error component shall indicate either:
  - 1) one of the errors from the General-Errors list; or
  - 2) “NoChargingInfoAvailable”, whichever is appropriate.

The “NoChargingInfoAvailable” value indicates that the served user would normally receive charging information but that in this case the information cannot be sent to the served user;

- d) if the network receives a request for any of the AOC supplementary services in any other message than a SETUP message, and item c) does not apply, then the network shall send a ChargingRequest return error component indicating “invalidCallState” to the user;
- e) if a user receives a ChargingRequest return error component from the network, the user shall not take any further protocol action. However, the user shall continue normal call handling;
- f) if a user or the network receives a reject component, no protocol actions shall be taken;
- g) if the user receives no response to the ChargingRequest invoke component and subsequently receives an AOCSCurrency, AOCSSpecialArr, AOCDCurrency, AOCDChargingUnit, AOCECurrency or AOCEChargingUnit invoke component, the user shall ignore this component;

- h) if the user receives a ChargingRequest return error component or a reject component as a response to a ChargingRequest invoke component and subsequently receives an AOCSCurrency, AOCSSpecialArr, AOCDCurrency, AOCDChargingUnit, AOCECurrency or AOCEChargingUnit invoke component, the user shall accept the information provided and shall not respond to the network;
- i) if a user requests on a per call basis an AOC supplementary service which is activated for all calls, the network shall acknowledge the request as specified in 2.9.1.1. However, the network shall only send charging information as a result of one activation of each AOC supplementary service activated.

## 2.9.2 Invocation and operation

In the following subclauses, the procedures for the transfer of charging information are given.

The transfer of charging information may occur:

- during the call establishment phase (AOC-S supplementary service);
- in the Active state of a call (AOC-S and AOC-D supplementary services);
- during the call clearing phase (AOC-S, AOC-D, and AOC-E supplementary services); or
- independent of a bearer at the user-network interface (AOC-E supplementary service).

NOTE – The transfer of charging information in an invoke component is done according to the operation class 5. Operation class 5 implies that neither a return result component nor a return error component will be received as an answer to an invoke component. A consequence of using this operation class is that the sending of information in an invoke component is not a confirmed service.

### 2.9.2.1 Transfer of charging information in the call establishment phase

#### 2.9.2.1.1 Normal operation

For the AOC-S supplementary service, the activation and invocation of the supplementary service is performed simultaneously, i.e. the activation works as both an activation and an invocation of the supplementary service.

For the AOC-S supplementary service, the network shall give charging information either in currency units or as a special charging arrangement.

NOTE – The parameters described for the AOC-S supplementary service to express the duration rate provide a solution both for continuous charging as well as for charging with charging units. It is up to the network to specify the value of the parameters in a manner that it will fit with the continuous charging method or with the step function method.

If sending AOC-S supplementary service information to the served user, the network shall include charging rate information related only to the particular service(s) requested by the user at call set-up.

When the network sends charging information to the served user in the call establishment phase, the network shall include the Facility information element in a call control message which is sent to the user (i.e. SETUP ACKNOWLEDGE, CALL PROCEEDING, PROGRESS, ALERTING, or CONNECT message – whichever is appropriate). Alternatively, the network can use a FACILITY message to send charging information to the user, if a call control message is not available when the information is to be sent.

The Facility information element shall contain information about the charging rate applicable to that call. If the AOC-S supplementary service is activated on a per call basis, the Facility information element shall contain the ChargingRequest return result component. If the AOC-S supplementary service is activated for all calls, the Facility information element shall contain an AOCSCurrency invoke component or an AOCSSpecialArr invoke component. This charging information shall consist of one of the following types:

- AOCSCurrencyInfoList; or
- AOCSSpecialArrInfo.

If the user receives a correctly encoded ChargingRequest return result component, the user shall accept the provided information and shall not respond to the network.

If the user receives a correctly encoded AOCSCurrency or AOCSSpecialArr invoke component, the user shall accept the provided information and shall not respond to the network.

#### 2.9.2.1.2 Exceptional procedures

In the case that charging information is not available in the network, the network shall inform the served user and the call shall be allowed to continue according to normal call handling procedures.

If the AOC-S supplementary service has been activated on a per call basis and if charging information is not available within the call establishment time, the network shall include a Facility information element within an appropriate message sent to the user. The Facility information element shall contain the ChargingRequest return error component indicating “NoChargingInfoAvailable”.

If the user receives a correctly encoded ChargingRequest return error component, the user shall accept the reason for error and shall not respond to the network.

If the AOC-S supplementary service is activated for all calls and if charging information is not available within the call establishment time, the network shall include a Facility information element within an appropriate message sent to the user. The Facility information element shall contain the invoke component indicating “chargeNotAvailable”.

If the user receives a correctly encoded AOCSCurrency or AOCSSpecialArr invoke component, the user shall accept the provided information and shall not respond to the network.

If the network receives a reject component from the user, the network shall take no further protocol actions. Normal call handling shall continue.

## **2.9.2.2 Transfer of charging information in the Active state**

### **2.9.2.2.1 Normal operation**

If the AOC-D supplementary service is offered, the originating network shall send charging information during a call. The rate of sending messages may vary from call to call and during a call.

If the AOC-S supplementary service is offered and if there is a subsequent change in the charging rate, the network shall indicate to the user when the change in the charging rate has occurred (e.g. the user has invoked a supplementary service during the Active state and this has an impact on the cost of the call, the changed charging rate information can only be given at the time the supplementary service is invoked).

When the network transfers charging information to the served user during the Active state, the network shall include the Facility information element in the FACILITY message sent to the user. The Facility information element shall contain one of the following types of charging information in an invoke component:

- a) charging rate, if a change in the charging rates has occurred and the AOC-S supplementary service has been activated; or
- b) cumulative charging information related to the AOC-D supplementary service. The network shall set TypeOfChargingInfo = “subTotal”.

In case a), the network shall send one of the following types of charging information to the served user:

- AOCSCurrencyInfoList in an AOCSCurrency invoke component; or
- AOCSSpecialArrInfo in an AOCSSpecialArr invoke component.

For the AOC-S supplementary service, the network shall give charging information either in currency units or as a special charging arrangement.

NOTE – The parameters described for the AOC-S supplementary service to express the duration rate provides a solution both for continuous charging as well as for charging with charging units. It is up to the network to specify the value of the parameters in a manner that it will fit with the continuous charging method or with the step function method.

In case b), the network shall send one of the following types of charging information to the served user:

- AOCDCurrencyInfo in an AOCDCurrency invoke component; or
- AOCDChargingUnitInfo in an AOCDChargingUnit invoke component.

If the AOC-D supplementary service is provided, the network shall give charging information, as a network option, either based on currency units or on charging units. Only the charged items that affect the charging applied to that call shall be covered.

If the user receives a correctly encoded AOCSCurrency, AOCSSpecialArr, AOCDCurrency or AOCDChargingUnit invoke component, the user shall accept the provided information and shall not respond to the network.

### **2.9.2.2.2 Exceptional procedures**

In the case that charging information is temporarily not available in the network, the network shall continue normal call handling and no indication shall be sent to the user. This applies to the cases where the AOC-S or AOC-D supplementary services are activated.

If the network receives a reject component from the user, the network shall take no further protocol actions. Normal call handling shall continue.

### **2.9.2.3 Transfer of charging information in the call clearing phase**

#### **2.9.2.3.1 Normal operation**

When the network transfers charging information to the served user in the call clearing phase, the network shall include the Facility information element either in the DISCONNECT or the RELEASE message, depending on who initiates the call clearing. If the served user initiates call clearing by sending a DISCONNECT message to the network, the network shall include the charging information in the RELEASE message sent from the network to the served user. If the remote user or the network initiates call clearing, the network shall include the charging information in the DISCONNECT message sent from the network to the served user.

In both these cases, if the AOC-S or AOC-D or the AOC-E supplementary services are activated, the network shall include the charging information in an invoke component within the Facility information element.

If the AOC-S supplementary service is activated, the network can send one of the following types of charging information:

- AOCSCurrencyInfoList in an AOCSCurrency invoke component; or
- AOCSSpecialArrInfo in an AOCSSpecialArr invoke component.

For the AOC-S supplementary service, the network shall give charging information either in currency units or as a special charging arrangement.

NOTE – The parameters described for the AOC-S supplementary service to express the duration rate provides a solution both for continuous charging as well as for charging with charging units. It is up to the network to specify the value of the parameters in a manner that it will fit with the continuous charging method or with the step function method.

If the AOC-D supplementary service is activated, the network shall send one of the following types of charging information:

- AOCDCurrencyInfo in an AOCDCurrency invoke component; or
- AOCDChargingUnitInfo in an AOCDChargingUnit invoke component.

In addition, for the AOC-D supplementary service, the network shall set the TypeOfChargingInfo = “total”.

If the AOC-E supplementary service is activated, the network shall send one of the following types of charging information:

- AOCECurrencyInfo in an AOCECurrency invoke component; or
- AOCEChargingUnitInfo in an AOCEChargingUnit invoke component.

If the AOC-D or AOC-E supplementary services are provided, the network shall give charging information, as a network option, either based on currency units or on charging units. Only the charged items that affect the charging applied to that call shall be covered.

If the user receives a correctly encoded AOCSCurrency, AOCSSpecialArr, AOCDCurrency, AOCDChargingUnit, AOCECurrency or AOCEChargingUnit invoke component, the user shall accept the provided information and shall not respond to the network.

In the case that the served user does not respond to a DISCONNECT message sent from the network, the network shall include the charging information, previously sent in the DISCONNECT message, in the subsequent RELEASE message(s) sent to the served user.

In the case that the served user does not respond to a RELEASE message sent from the network, the network shall include the charging information contained in the first RELEASE message in the retransmitted RELEASE message.

In the case that the network receives a RELEASE message as the first clearing message from the served user, the network shall send an invoke component containing charging information to the served user in the Facility information element within the RELEASE COMPLETE message.

#### **2.9.2.3.2 Exceptional procedures**

In the case that charging information is not available in the network, the network shall inform the served user and continue normal call handling procedures.

If an AOC supplementary service has been activated and:

- a) if charging information is not available to be sent to the served user and the network provides charging information based on currency units, then the network shall include the Facility information element in an appropriate message containing an invoke component indicating “chargeNotAvailable”;
- b) if charging information is available but not complete and the network provides charging information based on currency units or only one type of charging unit, then the network shall include an invoke component in the Facility information element in a clearing message sent from the network to the served user. The invoke component shall indicate “chargeNotAvailable”;
- c) if charging information is not available to be sent to the served user and only one type of charging unit is used, then the network shall include the Facility information element in an appropriate message containing an invoke component indicating “chargeNotAvailable”; or
- d) if more than one type of charging unit is used in the network and charging information related to all charging unit types is not available when charging information is to be sent to the served user, then the network shall send the available charging information and indicate “notAvailable” for the remaining charging unit types. This applies to both AOCDChargingUnitInfo and AOCEChargingUnitInfo.

If the call fails and the network knows that charges have been applied to the call, the recorded charges shall be transferred to the user. An invoke component contained in the Facility information element shall indicate the relevant charging information which is transferred to the served user. If the AOC-D supplementary service is activated, the network shall send one of the following types of charging information:

- AOCDCurrencyInfo in an AOCDCurrency invoke component; or
- AOCDChargingUnitInfo in an AOCDChargingUnit invoke component.

If the AOC-E supplementary service is activated, the network shall send one of the following types of charging information:

- AOCECurrencyInfo in an AOCECurrency invoke component; or
- AOCEChargingUnitInfo in an AOCEChargingUnit invoke component.

If the user receives a correctly encoded AOCDCurrency, AOCDChargingUnit, AOCECurrency or AOCEChargingUnit invoke component, the user shall accept the provided information and shall not respond to the network.

If the network receives a reject component from the user, the network shall take no further protocol actions. Normal call handling shall continue.

#### **2.9.2.4 Transfer of charging information independent of a bearer at the user-network interface**

##### **2.9.2.4.1 Normal operation**

In some cases, the network shall transfer charging information to the served user, without a bearer being established at the user-network interface (e.g. in connection with the invocation of a Diversion supplementary service). This can occur only when the AOC-E supplementary service is activated. The network shall send the charging information to the served user when the call, incurring the charge, is released (e.g. the diverted call).

The network shall send the charging information in a FACILITY message containing in the Called party number information element the ISDN number used in the activation and/or invocation of the supplementary service for which charging information is to be sent. If the network has not received an ISDN number from the user, then the network shall not include the Called party number information element in the FACILITY message when the charging information is sent.

The network shall send the FACILITY message using the dummy call reference, as specified in clause 8/Q.932. If the network knows that a point-to-multipoint configuration exists at the served user’s access, the network shall send the FACILITY message using the broadcast datalink. Otherwise, the network shall send the FACILITY message using the already established datalink.

The FACILITY message shall contain the Facility information element and indicate in the “AOCEBillingId” of the invoke component why this charge is incurred (e.g. a call has been diverted and the served user is paying for some part of the diverted call). The “AOCEBillingId” is transferred in one of the following types of charging information:

- AOCECurrencyInfo in an AOCECurrency invoke component; or
- AOCEChargingUnitInfo in an AOCEChargingUnit invoke component.

If the user receives a correctly encoded AOCECurrency or AOCEChargingUnit invoke component, the user shall accept the provided information and shall not respond to the network.

If the AOC-E supplementary service is provided, the network shall give charging information, as a network option, either based on currency units or on charging units. Only the charged items that affect the charging applied to that call shall be covered.

In order to identify that the charging information is associated with a particular call, an optional chargingAssociation parameter can be included in the charging information which is sent to the served user when such a call is cleared. The procedures for generating and using the “chargingAssociation” parameter shall be as defined in 2.12.

#### **2.9.2.4.2 Exceptional procedures**

If an AOC supplementary service has been activated and:

- a) if charging information is not available to be sent to the served user and the network provides charging information based on currency units, then the network shall send an invoke component indicating “chargeNotAvailable” in a Facility information element within a FACILITY message to the served user;
- b) if charging information is available but not complete and the network provides charging information based on currency units or only one type of charging unit, then the network shall include an invoke component in the Facility information element within a FACILITY message sent from the network to the served user. The invoke component shall indicate “chargeNotAvailable”;
- c) if charging information is not available to be sent to the served user and only one type of charging unit is used, then the network shall send a Facility information element containing an invoke component indicating “chargeNotAvailable” within a FACILITY message to the served user; or
- d) if more than one type of charging unit is used in the network and charging information related to all charging unit types is not available when charging information is to be sent to the served user, then the network shall send the available charging information and indicate “notAvailable” for the remaining charging unit types in a FACILITY message.

If provided, the FACILITY message shall contain in the Called party number information element the ISDN number used in the activation and/or invocation of the supplementary service for which charging information is to be sent. If the network has not received an ISDN number from the user, then the network shall not include the Called party number information element in the FACILITY message when the charging information is sent.

The network shall send the FACILITY message using the dummy call reference, as specified in clause 8/Q.932. If the network knows that a point-to-multipoint configuration exists at the served user’s access, the network shall send the FACILITY message using the broadcast datalink. Otherwise, the network shall send the FACILITY message using the already established datalink.

In order to identify that the charging information is associated with a particular call, an optional ChargingAssociation parameter can be included in the charging information which is sent to the served user when such a call is cleared. The procedures for generating and using the “chargingAssociation” parameter shall be as defined in 2.12.

If the network receives a reject component from the user, the network shall take no further protocol actions. Normal call handling shall continue.

## **2.10 Procedures for interworking with private ISDNs**

The same procedures apply as for 2.9 (e.g. no special procedures apply).

## **2.11 Interactions with other networks**

### **2.11.1 Procedures for interworking with other public networks**

None defined.

## **2.12 Interaction with other supplementary services**

When the network supports the use of the IdentificationOfCharge operation, it may only be used with the ECT and CD supplementary services and partial rerouting in conjunction with the diversion supplementary services. If the network receives an IdentificationOfCharge invoke component in addition to the activation or invocation of any other supplementary service, the network shall return an IdentificationOfCharge return error component indicating “supplementaryServiceInteractionNotAllowed” to the user. The network shall include the IdentificationOfCharge return error component in a Facility information element, either in an appropriate call control message or in a FACILITY message.

### **2.12.1 Call Waiting (CW)**

No interaction.

### **2.12.2 Explicit Call Transfer (ECT)**

#### **2.12.2.1 Signalling procedures at the coincident S and T reference point**

##### **2.12.2.1.1 Delivery of charging information to the transferring user**

###### **2.12.2.1.1.1 Normal procedures**

For each call for which the AOC-D supplementary service is activated, the network shall not send any charging information to the served user after that call has been transferred. When the call transfer is completed and the network releases the served user, the network shall send AOC-D charging information in one of the call control messages clearing that call. If the served user is charged for a part of the transferred call, the network shall set the TypeOfChargingInfo = “subTotal”. Otherwise the network shall set the TypeOfChargingInfo = “total”.

If the AOC-S supplementary service is activated and if the charging rate is changed after the call has been transferred, the network shall not send any information about the changed charging rate to the served user.

As a network option, the network shall send AOC-E type charging information pertaining to a transferred call, after the transferred call is released. In this case, the charging information shall be transferred using the procedures specified in 2.9.2.4. If the served user activates the AOC-E supplementary service or if the AOC-E supplementary service is activated for all calls and the user invokes the ECT supplementary service, the user may in addition send an IdentificationOfCharge invoke component containing the argument ChargingAssociation to the network. In order to associate the IdentificationOfCharge invoke component with the call to be transferred, the user shall include the IdentificationOfCharge invoke component within the same FACILITY message that contains either the EctExecute or the ExplicitEctExecuteinvoke component.

The user shall choose for each call either the PartyNumber or the ChargeIdentifier type of the ChargingAssociation, when the ChargingAssociation parameter is used.

If the network receives the IdentificationOfCharge invoke component and the network supports the option to send AOC-E charging information in connection with the ECT supplementary service, the network shall retain the provided ChargingAssociation parameter.

When the transferred call is released, the network shall send the retained ChargingAssociation parameter together with the AOC-E charging information to the served user and subsequently release the retained ChargingAssociation parameter. The ChargingAssociation parameter provides additional information for the user to identify the call to which a specific AOC-E charging information is related.

In the case that the user has subscribed to the MSN supplementary service, the network shall return the served user’s number associated with the call reference on which the EctExecute or the ExplicitEctExecute invoke component was sent in the Called party number information element when the AOC-E charging information is sent to the user.

When the network offers the option of sending charging information for the transferred call and if the served user is charged for both calls (before the ECT supplementary service is invoked) and if the AOC-E supplementary service is activated for each call, then the network shall send the overall charges for both calls to the served user when the transferred call is released. If the AOC-E supplementary service is only activated for one call, then the network shall only send the charge for this call to the served user when the transferred call is released.

The network shall send the charging information in the Facility information element and indicate the following information:

- AOCECurrencyInfo, and optionally the AOCEBillingId = “callTransfer”, in an AOCECurrency invoke component; or
- AOCEChargingUnitInfo, and optionally the AOCEBillingId = “callTransfer”, in an AOCEChargingUnit invoke component.

#### **2.12.2.1.1.2 Exceptional procedures**

If, on receipt of an IdentificationOfCharge invoke component, the user has not subscribed to the AOC-E supplementary service, the network shall send an IdentificationOfCharge return error component indicating “userNotSubscribed” to the user. The network shall include the IdentificationOfCharge return error component in a Facility information element, either in an appropriate call control message or in a FACILITY message.

If a user sends an IdentificationOfCharge invoke component to the network and the user has subscribed to AOC-E supplementary service on a per call basis but the user has not activated the AOC-E supplementary service for this particular call, the network shall send an IdentificationOfCharge return error component to the user, indicating “notAvailable”. The network shall include the IdentificationOfCharge return error component in a Facility information element, either in an appropriate call control message or in a FACILITY message.

#### **2.12.2.2 Procedures for interworking with private ISDNs**

The procedures of 2.12.2.1 shall apply.

#### **2.12.3 Connected Line Identification Presentation (COLP)**

No interaction.

#### **2.12.4 Connected Line Identification Restriction (COLR)**

No interaction.

#### **2.12.5 Calling Line Identification Presentation (CLIP)**

No interaction.

#### **2.12.6 Calling Line Identification Restriction (CLIR)**

No interaction.

#### **2.12.7 Closed User Group (CUG)**

No interaction.

#### **2.12.8 Conference Calling (CONF)**

##### **2.12.8.1 Signalling procedures at the coincident S and T reference point**

###### **2.12.8.1.1 Normal operation**

The network shall use the call reference of the conference call when it sends charging information to a conference-controlling user (local interaction for the call). In this case, the network shall send charging information related to the whole conference.

If the user invokes the CONF supplementary service from a call in the (Active call state, Idle auxiliary state) or (Active call state, Call Held auxiliary state) and an AOC supplementary service is requested for the resulting conference call, the user shall include the ChargingRequest invoke component in the same FACILITY message that contains the BeginCONF invoke component as defined in 1.4/Q.954. The user shall indicate in the ChargingCase parameter which AOC supplementary service is requested.

If a remote user is split from the conference, the network shall use the call reference established for the private communication when sending charging information for that connection if an AOC supplementary service is activated. When the private communication is terminated, the network shall send the relevant charging information as for a call in the clearing phase (see 2.9.2.3). If the AOC-D supplementary service is activated for the private communication, the network shall set the TypeOfChargingInfo = "total" when charging information is sent in a call control message terminating the private communication.

#### **2.12.8.1.2 Exceptional procedures**

If a user sends a ChargingRequest invoke component requesting an AOC supplementary service in the FACILITY message together with any invoke component defined for the CONF supplementary service (see 1.4/Q.954) except the BeginCONF invoke component, then the network shall respond with a ChargingRequest return error component indicating "notAvailable" to the user.

If the network receives a ChargingRequest invoke component together with a BeginCONF invoke component and the network does not support the AOC supplementary service in conjunction with the CONF supplementary service, then the network shall respond with a ChargingRequest return error component indicating "notAvailable" to the user.

If a user sends a ChargingRequest invoke component requesting an AOC supplementary service in the FACILITY message together with the BeginCONF invoke component and invocation of the CONF supplementary service is not accepted by the network (e.g. no resources are available), then the network shall not activate the requested AOC supplementary service and respond with a ChargingRequest return error component indicating "notAvailable" to the user.

#### **2.12.8.2 Procedures for interworking with private ISDNs**

The procedures of 2.12.8.1 shall apply.

#### **2.12.9 Direct-Dialling-In (DDI)**

No interaction.

#### **2.12.10 Call Diversion (call forwarding) services**

##### **2.12.10.1 Call Forwarding Busy (CFB)**

###### **2.12.10.1.1 Signalling procedures at the coincident S and T reference point**

The invocation of the following supplementary services is not applicable in combination with the CFB supplementary service:

- the AOC-S supplementary service; and
- the AOC-D supplementary service.

As a network option, if the AOC-E supplementary service is activated for all calls and the CFB supplementary service has been activated, the network shall send charging information to the forwarding (served) user when a forwarded call is released.

###### **2.12.10.1.1.1 Delivery of charging information to the forwarding user**

###### **2.12.10.1.1.1.1 Normal operation**

If the network supports the option to send charging information to the forwarding user when a forwarded call is released, then the network shall include the charging information in an invoke component within the Facility information element, to be conveyed in a FACILITY message, as specified in 2.9.2.4.

The invoke component shall contain the following charging information:

- AOCECurrencyInfo and optionally the AOCEBillingId, in an AOCECurrency invoke component; or
- AOCEChargingUnitInfo and optionally the AOCEBillingId, in an AOCEChargingUnit invoke component.

The network shall set the AOCEBillingId = "callForwardingBusy".

In the case that the user has subscribed to the MSN supplementary service, the network shall return the served user's multiple subscriber number in the Called party number information element when the AOC-E charging information is sent to the user.

#### **2.12.10.1.1.2 Exceptional procedures**

No impact.

#### **2.12.10.1.2 Procedures for interworking with private ISDNs**

The invocation of the following supplementary services is not applicable in combination with the CFB supplementary service:

- the AOC-S supplementary service; and
- the AOC-D supplementary service.

As a network option, if the AOC-E supplementary service is activated for all calls and the CFB supplementary service has been activated, the network shall send charging information to the forwarding (served) user when a forwarded call is released.

##### **2.12.10.1.2.1 Delivery of charging information to the private network when the CFB supplementary service is provided to the private ISDN**

If the network supports the option to send charging information to the forwarding private network when a forwarded call is released and the private network has activated the CFB supplementary service for the whole private network, then the procedures of 2.12.10.1.1 shall apply. In addition, if the DDI supplementary service applies, the network shall return the called party number of the diverted call in the Called party number information element when the AOC-E charging information is sent to the user.

##### **2.12.10.1.2.2 Delivery of charging information to the private network when partial rerouting applies**

###### **2.12.10.1.2.2.1 Normal operation**

If the private network activates the AOC-E supplementary service on a per call basis, the ChargingRequest invoke component shall also be included within the same FACILITY message that contains the CallRerouting invoke component as defined in 4.2/Q.952, with the ChargingCase parameter indicating “chargingAtTheEndOfACall”.

If the AOC-E supplementary service is activated and the private network invokes the partial rerouting procedures, the private network may in addition send an IdentificationOfCharge invoke component containing the argument ChargingAssociation to the network. In order to associate the IdentificationOfCharge invoke component with the call to be diverted, the private network shall include the IdentificationOfCharge invoke component within the same FACILITY message that contains the CallRerouting invoke component as defined in 4.2/Q.952.

When the ChargingAssociation parameter is used, the private network shall, on a per call basis, choose either the PartyNumber or the ChargeIdentifier type of the ChargingAssociation.

If the network receives the IdentificationOfCharge invoke component and the network supports the option to send AOC-E charging information in connection with the CFB supplementary service, the network shall retain the provided ChargingAssociation parameter.

When the diverted call is released and the network supports the option to send charging information to the forwarding user when a forwarded call is released, then the network shall send the retained ChargingAssociation parameter to the user, together with the AOC-E charging information and subsequently release the retained ChargingAssociation parameter. The ChargingAssociation parameter provides additional information for the user to identify the call to which a specific AOC-E charging information is related.

The network shall include the charging information in an invoke component within the Facility information element, to be conveyed in a FACILITY message, as specified in 2.9.2.4.

The invoke component shall contain the following charging information:

- AOCECurrencyInfo and optionally the AOCEBillingId, in an AOCECurrency invoke component; or
- AOCEChargingUnitInfo and optionally the AOCEBillingId, in an AOCEChargingUnit invoke component.

If the ReroutingReason parameter received in the CallRerouting invoke component indicated “cfu” or “unknown”, then the network shall set the AOCEBillingId = “callForwardingUnconditional”.

If the `ReroutingReason` parameter received in the `CallRerouting` invoke component indicated “cfb”, then the network shall set the `AOCEBillingId` = “callForwardingBusy”.

If the `ReroutingReason` parameter received in the `CallRerouting` invoke component indicated “cfnr”, then the network shall set the `AOCEBillingId` = “callForwardingNoReply”.

If the `ReroutingReason` parameter received in the `CallRerouting` invoke component indicated either “cd” or “cdImmediate”, then the network shall set the `AOCEBillingId` = “callDeflection”.

#### **2.12.10.1.2.2.2 Exceptional procedures**

See 2.12.2.1.1.2.

#### **2.12.10.2 Call Forwarding No Reply (CFNR)**

The procedures of 2.12.10.1 shall apply with the exception that the network shall set the `AOCEBillingId` = “callForwardingNoReply”.

#### **2.12.10.3 Call Forwarding Unconditional (CFU)**

The procedures of 2.12.10.1 shall apply with the exception that the network shall set the `AOCEBillingId` = “callForwardingUnconditional”.

#### **2.12.10.4 Call Deflection (CD)**

##### **2.12.10.4.1 Signalling procedures at the coincident S and T reference point**

The invocation of the following supplementary services is not applicable in combination with the invocation of the CD supplementary service:

- the AOC-S supplementary service; and
- the AOC-D supplementary service.

As a network option, if the AOC-E supplementary service is activated for all calls, the network shall send charging information to the deflecting (served) user when a deflected call is released.

##### **2.12.10.4.1.1 Delivery of charging information to the deflecting user**

###### **2.12.10.4.1.1.1 Normal operation**

If the AOC-E supplementary service is activated for all calls and the user invokes the CD supplementary service, the user may in addition send an `IdentificationOfCharge` invoke component containing the argument `ChargingAssociation` to the network. In order to associate the `IdentificationOfCharge` invoke component with the call to be deflected, the user shall include the `IdentificationOfCharge` invoke component within the same message that contains the `callDeflection` invoke component (as defined in 4.2/Q.952).

The user shall choose for each call either the `PartyNumber` or the `ChargeIdentifier` type of the `ChargingAssociation`, when the `ChargingAssociation` parameter is used.

If the network receives the `IdentificationOfCharge` invoke component and the network supports the option to send AOC-E charging information in combination with the CD supplementary service, the network shall retain the provided `ChargingAssociation` parameter.

When the deflected call is released and the network supports the option to send charging information to the deflecting user when the deflected call is released, then the network shall send the retained `ChargingAssociation` parameter to the user, together with the AOC-E charging information and subsequently release the retained `ChargingAssociation` parameter. The `ChargingAssociation` parameter provides additional information in order for the user to identify the call to which a specific AOC-E charging information is related.

The network shall include the charging information in an invoke component within the `Facility` information element, to be conveyed in a `FACILITY` message, as specified in 2.9.2.4.

The invoke component shall contain the following charging information:

- `AOCECurrencyInfo` and optionally the `AOCEBillingId`, in an `AOCECurrency` invoke component; or
- `AOCEChargingUnitInfo` and optionally the `AOCEBillingId`, in an `AOCEChargingUnit` invoke component.

The network shall set the AOCEBillingId = "callDeflection".

In the case that the user has subscribed to the MSN supplementary service, the network shall return the called party number of the deflected call in the Called party number information element when the AOC-E charging information is sent to the user.

#### **2.12.10.4.1.1.2 Exceptional procedures**

See 2.12.2.1.1.2.

#### **2.12.10.4.2 Procedures for interworking with private ISDNs**

The invocation of the following supplementary services is not applicable in combination with the invocation of the CD supplementary service:

- the AOC-S supplementary service; and
- the AOC-D supplementary service.

##### **2.12.10.4.2.1 Delivery of charging information to the private network when the CD supplementary service is provided to the private ISDN**

As a network option, if the AOC-E supplementary service is activated for all calls, the network shall send charging information to the deflecting (served) user when a deflected call is released.

If the network supports the option to send charging information to the deflecting private network when a deflected call is released and the private network has invoked the CD supplementary service by sending a CallDeflection invoke component to the network, then the procedure of 2.12.10.4.1.1 shall apply. In addition, if the DDI supplementary service applies, the network shall return the called party number of the deflected call in the Called party number information element when the AOC-E charging information is sent to the user.

##### **2.12.10.4.2.2 Delivery of charging information to the private network when partial rerouting applies**

The procedures of 2.12.10.1.2.2 shall apply.

#### **2.12.11 Line Hunting (LH)**

No access signalling requirements defined.

#### **2.12.12 Three-Party Service (3PTY)**

##### **2.12.12.1 Signalling procedures at the coincident S and T reference point**

###### **2.12.12.1.1 Normal operation**

If the served user has activated any of the AOC supplementary services, the network shall send charging information as for a normal call to the user, i.e. for those calls originated by the served user as defined in 2.9.2.1.1, 2.9.2.2.1 and 2.9.2.3.1.

If the network option to indicate charges for the use of the conference bridge applies, then the network shall send this charging information to the user, only when an AOC supplementary service is activated for the call (identified by its call reference) that is used to convey the Begin3PTY invoke component.

###### **2.12.12.1.2 Exceptional procedures**

No impact.

###### **2.12.12.2 Procedures for interworking with private ISDNs**

No impact.

#### **2.12.13 User-to-User Signalling (UUS)**

No interaction.

#### **2.12.14 Multiple Subscriber Number (MSN)**

No interaction.

#### **2.12.15 Call Hold (HOLD)**

No interaction.

#### **2.12.16 Advice Of Charge (AOC)**

##### **2.12.16.1 AOC-S interactions to AOC-D and AOC-E**

No interaction.

##### **2.12.16.2 AOC-D interactions to AOC-E**

If the AOC-D and AOC-E supplementary services are activated for the same call, the network shall only send AOC-E type charging information when the call is released.

#### **2.12.17 Sub-addressing (SUB)**

No interaction.

#### **2.12.18 Terminal Portability (TP)**

##### **2.12.18.1 Signalling procedures at the coincident S and T reference point**

###### **2.12.18.1.1 In the call suspension phase**

###### **2.12.18.1.1.1 Normal operation**

If a served user of the AOC-D supplementary service suspends a call (local interaction for the call), then as a network option, the network shall send charging information to the served user in the SUSPEND ACKNOWLEDGE message. In that case, the Facility information element shall be included in the SUSPEND ACKNOWLEDGE message containing the cumulative charge (i.e. the sub-total charge incurred up to the moment when the call is suspended).

The network shall send one of the following types of charging information to the served user:

- AOCDCurrencyInfo in an AOCDCurrency invoke component; or
- AOCDChargingUnitInfo in an AOCDChargingUnit invoke component.

The TypeOfChargingInfo shall be set to “subtotal”.

NOTE 1 – Charging can continue during the time the call is suspended (while timer T307 is running). If the served user does not resume the call before T307 expires, the charging information recorded for this call may be different from the charging information sent to the served user either prior to or during the sending of the SUSPEND ACKNOWLEDGE message. This also applies if the remote user clears the call during the period of suspension.

In some cases the charging information cannot be available in time to be included in the SUSPEND ACKNOWLEDGE message sent to the served user.

NOTE 2 – This may happen when the charging information resides in an ISDN entity that is remote from the network generating the SUSPEND ACKNOWLEDGE message.

In this case the network shall send the Facility information element in the SUSPEND ACKNOWLEDGE message to indicate to the served user that the charging information is not available (i.e. “chargeNotAvailable”) and the call suspension shall continue as defined in Recommendation Q.931.

###### **2.12.18.1.1.2 Exceptional procedures**

No impact.

### **2.12.18.1.2 In the call resume phase**

#### **2.12.18.1.2.1 Normal operation**

When a served user resumes a call, the network shall also resume sending of charging information to the user if the AOC-D supplementary service is activated for the call. In addition, charging information may, as a network option, be sent to the served user in the RESUME ACKNOWLEDGE message. In that case, the network shall include the Facility information element in the RESUME ACKNOWLEDGE message, containing one of the following types of charging information:

- AOCDCurrencyInfo in an AOCDCurrency invoke component; or
- AOCDChargingUnitInfo in an AOCDChargingUnit invoke component.

The TypeOfChargingInfo shall be set to “subtotal”.

In some cases the charging information cannot be available in time to be included in the RESUME ACKNOWLEDGE message sent to the served user.

NOTE – This may happen when the charging information resides in an ISDN entity that is remote from the network generating the RESUME ACKNOWLEDGE message.

In this case the network shall send the Facility information element in the RESUME ACKNOWLEDGE message to indicate to the served user that the charging information is not available (i.e. “chargeNotAvailable”) and normal call handling shall continue. When the charging information has become available after a call has been resumed, the network shall send a FACILITY message to the served user containing the charging information shown above.

If the AOC-S supplementary service is activated for the call, the network shall send charging rates applied to the call in the first message sent to the served user after call resumption, if the charging rate has been changed during the time the call was suspended.

As a network option, the network shall transfer charging information to the served user even though the network cannot resume a suspended call (within the time the network retains the call identity of the suspended call). The network shall include the Facility information element in the RESUME REJECT message if the served user attempts to resume the call before timer T307 expires. The network shall retain the charging information for the suspended call as long as it retains the call identity of the suspended call. The following cases are applicable:

- a) If the remote user disconnects while the call is suspended:  
Either the AOC-D or the AOC-E type charging information can be provided, if the supplementary service is activated for the call. If the AOC-D supplementary service is activated, the network shall set the TypeOfChargingInfo = “total” when charging information is sent to the served user.
- b) If resumption is rejected for any other reason:  
Only cumulative charging during a call can be provided, if the supplementary service is activated for the call (i.e. the served user attempts to resume the call a number of times before the call retention timer expires). If the AOC-D supplementary service is activated, the network shall set the TypeOfChargingInfo = “subTotal” when charging information is sent to the served user.

#### **2.12.18.1.2.2 Exceptional procedures**

No impact.

### **2.12.18.2 Procedures for interworking with private ISDNs**

No impact.

## **2.12.19 Completion of Calls to Busy Subscriber (CCBS)**

### **2.12.19.1 Signalling procedures at the coincident S and T reference point**

#### **2.12.19.1.1 Requesting an AOC supplementary service**

##### **2.12.19.1.1.1 Normal operation**

The network shall store the accepted request for the AOC supplementary service for the original call and apply it to the CCBS call established by this particular CCBS instance as identified for this user.

When this particular CCBS instance is completed (e.g. the CCBS call is successfully established, or the CCBS supplementary service is cancelled), the network shall release the retained AOC request.

#### **2.12.19.1.1.2 Exceptional procedures**

The procedures specified in 2.9.1.2 shall apply.

#### **2.12.19.1.2 Delivery of charging information to the user**

##### **2.12.19.1.2.1 Normal operation**

No impact.

NOTE – Charging information sent by the network to the user for the original call and the CCBS call will follow the procedures specified for the relevant AOC supplementary services according to 2.9.2.1.1, 2.9.2.2.1 and 2.9.2.3.1.

##### **2.12.19.1.2.2 Exceptional procedures**

No impact.

NOTE – The procedures defined in 2.9.2.1.2, 2.9.2.2.2 and 2.9.2.3.2 will apply.

#### **2.12.19.2 Procedures for interworking with private ISDNs**

##### **2.12.19.2.1 Requesting an AOC supplementary service by the private network**

###### **2.12.19.2.1.1 Normal operation**

To request an AOC supplementary service for the CCBS call, the private network shall apply the procedures as defined in 2.9.1.1.

NOTE – If an AOC supplementary service was requested for the original call, then the private network will include a ChargingRequest invoke component indicating the same service in the SETUP message used to establish the CCBS call.

The network shall, upon receiving the ChargingRequest invoke component, check if the user has access to the requested AOC supplementary service and, if so, send a ChargingRequest return result component in a FACILITY message or an appropriate call control message to the private network.

###### **2.12.19.2.1.2 Exceptional procedures**

The procedures defined in 2.9.1.2 shall apply.

##### **2.12.19.2.2 Delivery of charging information to the private network**

###### **2.12.19.2.2.1 Normal operation**

When the network sends charging information to the private network, the procedures specified in 2.9.2.1.1, 2.9.2.2.1 and 2.9.2.3.1 shall apply.

###### **2.12.19.2.2.2 Exceptional procedures**

The procedures defined in 2.9.2.1.2, 2.9.2.2.2 and 2.9.2.3.2 shall apply.

#### **2.12.20 Malicious Call Identification (MCID)**

No interaction.

#### **2.12.21 Reverse Charging (REV)**

Charging information can only be sent to a called user when this user has activated the AOC supplementary service for all calls.

##### **2.12.21.1 Interaction between AOC-S and REV**

###### **2.12.21.1.1 REV case A and D**

###### **2.12.21.1.1.1 Calling user**

The network should indicate that this call is free of charge by either setting the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, before sending the charging information to the calling user.

#### **2.12.21.1.1.2 Called user**

The normal AOC-S procedures apply.

#### **2.12.21.1.2 REV case B and C**

##### **2.12.21.1.2.1 Calling user**

For case B, the network should indicate that this call is free of charge by either setting the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, before sending the charging information to the calling user after the called user has accepted the request for reverse charging.

For case C, the network should indicate that this call is free of charge by either setting the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, before sending the charging information to the calling user after the network has accepted the request for reverse charging. In addition, the network sends a Notification indicator information element indicating “reverse charging (whole call)” to the served user. The “reverse charging (whole call)” notification, in association with either the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, shall be interpreted by the served user as indicating that the call is free of charge from the moment the call was started.

##### **2.12.21.1.2.2 Called user**

The normal AOC-S procedures apply.

#### **2.12.21.2 Interaction between AOC-D and REV**

##### **2.12.21.2.1 REV case A and D**

###### **2.12.21.2.1.1 Calling user**

The network should indicate that this call is free of charge by either setting the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, before sending the charging information to the calling user.

###### **2.12.21.2.1.2 Called user**

The network should apply the normal AOC-D procedures during the call. When the call is released, the network shall set TypeOfChargingInfo = “total” and optionally include AOCDBillingId = “reverseCharging” in the charging information sent to the called user.

###### **2.12.21.2.2 REV case B**

###### **2.12.21.2.2.1 Calling user**

The normal AOC-D procedures apply.

###### **2.12.21.2.2.2 Called user**

The network should apply the normal AOC-D procedures during the call, after the request for reverse charging has been accepted by the called user. When the call is released, the network shall set TypeOfChargingInfo = “total” and optionally include AOCDBillingId = “reverseCharging” in the charging information sent to the called user.

###### **2.12.21.2.3 REV case C**

###### **2.12.21.2.3.1 Calling user**

The network should indicate that this call is free of charge by either setting the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, when sending the charging information to the calling user after the network has accepted the request for reverse charging. When the call is released, the network shall either set the “freeOfCharge” indication or the CurrencyAmount parameter = “0”, and TypeOfChargingInfo = “total” before sending the charging information to the calling user.

###### **2.12.21.2.3.2 Called user**

Two cases exist. Case 1 describes the procedure if the network is able to indicate the total charges applied to the call, and case 2 describes the case that the network is not able to indicate the charges incurred before the request for reverse charging is accepted by the network.

Case 1: The sub-total charges are indicated by the network to the called user according to the normal AOC-D procedures after the network has accepted the request for reverse charging. When the call is released, the network shall set TypeOfChargingInfo = "total" and optionally include AOCEBillingId = "reverseCharging" in the charging information sent to the called user.

Case 2: The network shall indicate "chargeNotAvailable" to the called user after the network has accepted the request for reverse charging, and also when the call is released.

### **2.12.21.3 Interaction between AOC-E and REV**

#### **2.12.21.3.1 REV case A and D**

##### **2.12.21.3.1.1 Calling user**

The network should indicate that this call is free of charge by either setting the "freeOfCharge" indication or the CurrencyAmount parameter = "0", before sending the charging information to the calling user.

##### **2.12.21.3.1.2 Called user**

When the call is released, the network shall optionally include AOCEBillingId = "reverseCharging" in the charging information sent to the called user.

#### **2.12.21.3.2 REV case B**

##### **2.12.21.3.2.1 Calling user**

The normal AOC-E procedures apply for the part of the call that the calling user is charged for.

##### **2.12.21.3.2.2 Called user**

The normal AOC-E procedures apply for the part of the call that the called user is charged for. Optionally the network shall include AOCEBillingId = "reverseCharging" in the charging information sent to the called user.

#### **2.12.21.3.3 REV case C**

##### **2.12.21.3.3.1 Calling user**

When the call is released, the network shall either set the "freeOfCharge" indication or the CurrencyAmount parameter = "0", before sending the charging information to the calling user.

##### **2.12.21.3.3.2 Called user**

Two cases exist. Case 1 describes the procedure if the network is able to indicate the total charges applied to the call, and case 2 describes the case that the network is not able to indicate the charges incurred before the request for reverse charging is accepted by the called user.

Case 1: When the call is released, the network shall optionally include AOCEBillingId = "reverseCharging" in the charging information sent to the called user.

Case 2: The network shall indicate "chargeNotAvailable" to the called user when the call is released.

### **2.12.22 Multi-Level Precedence and Preemption (MLPP)**

No interaction.

### **2.12.23 Support of Private Numbering Plan (SPNP)**

No applicable interaction at this time.

### **2.12.24 International Telecommunication Charge Card (ITCC)**

No applicable interaction at this time.

### **2.12.25 Global Virtual Network Services (GVNS)**

No applicable interaction at this time.

### **2.13 Parameter values (timers)**

None defined.

### **2.14 Dynamic description (SDLs)**

The dynamic descriptions are specified in Figures 2-1 through 2-9, according to Recommendation Z.100 [9]. Figures 2-1 and 2-2 show the user side of the AOC supplementary service. Figures 2-3 through 2-9 show the network side.

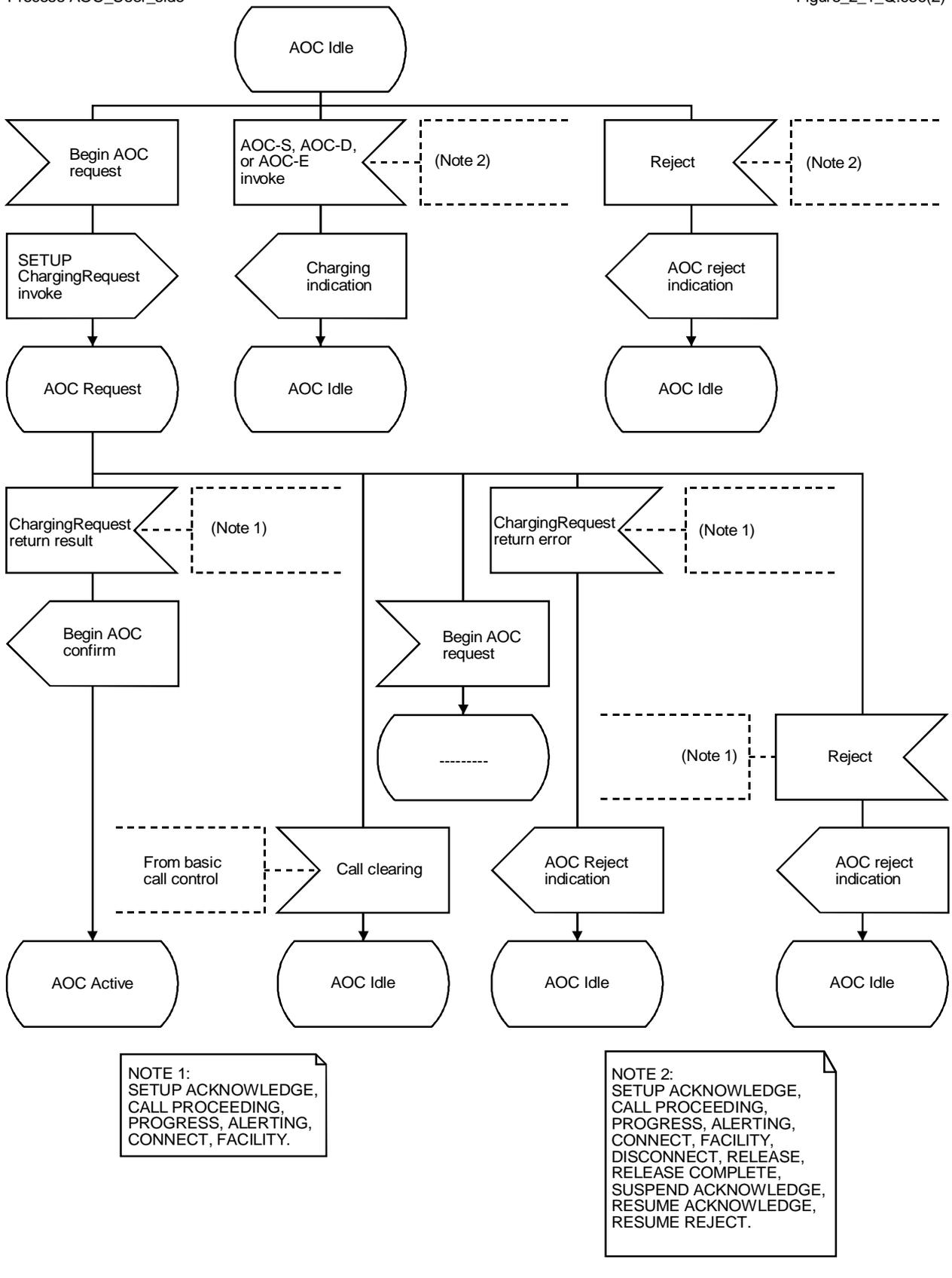
In Figures 2-1, 2-2 and 2-3, one instance of the described process shall exist for each AOC supplementary service requested. These instances of the described process shall operate independently of each other. Each request for an AOC supplementary service shall be handled by a separate process and multiple requests for AOC supplementary services can be included in a SETUP message.

The following abbreviations are used in the SDL diagrams:

AOC-S invoke = AOCSSpecialArr or AOCSCurrency invoke component

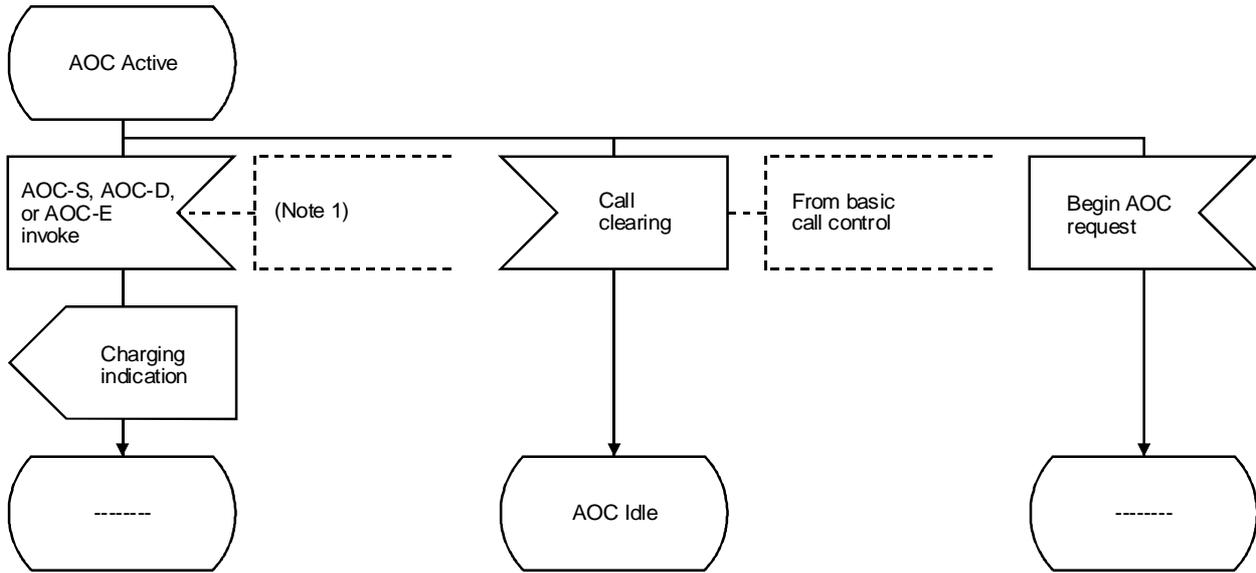
AOC-D invoke = AOCDCurrency or AOCDChargingUnit invoke component

AOC-E invoke = AOCECurrency or AOCEChargingUnit invoke component



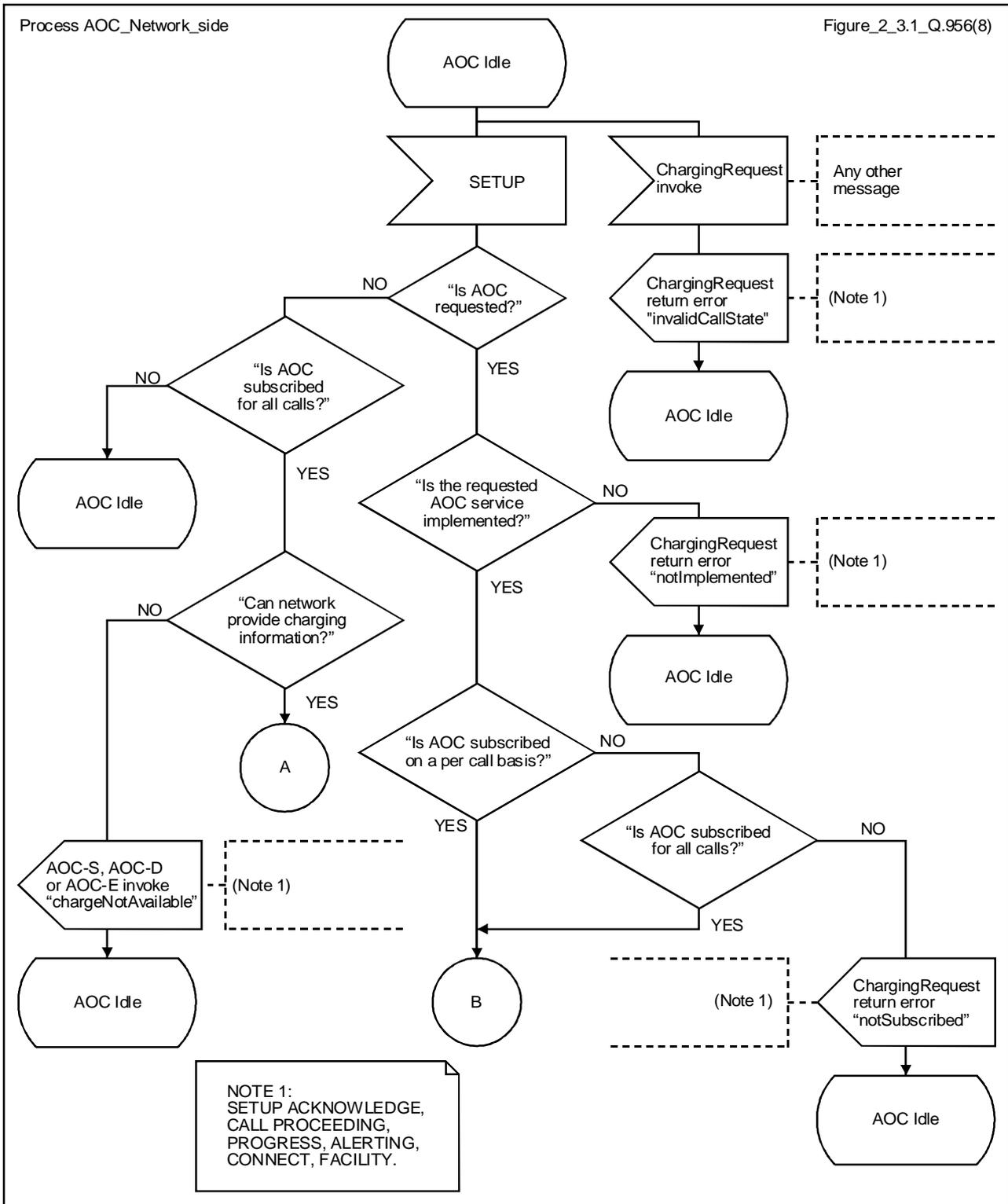
T1167380-94/d01

FIGURE 2-1/Q.956



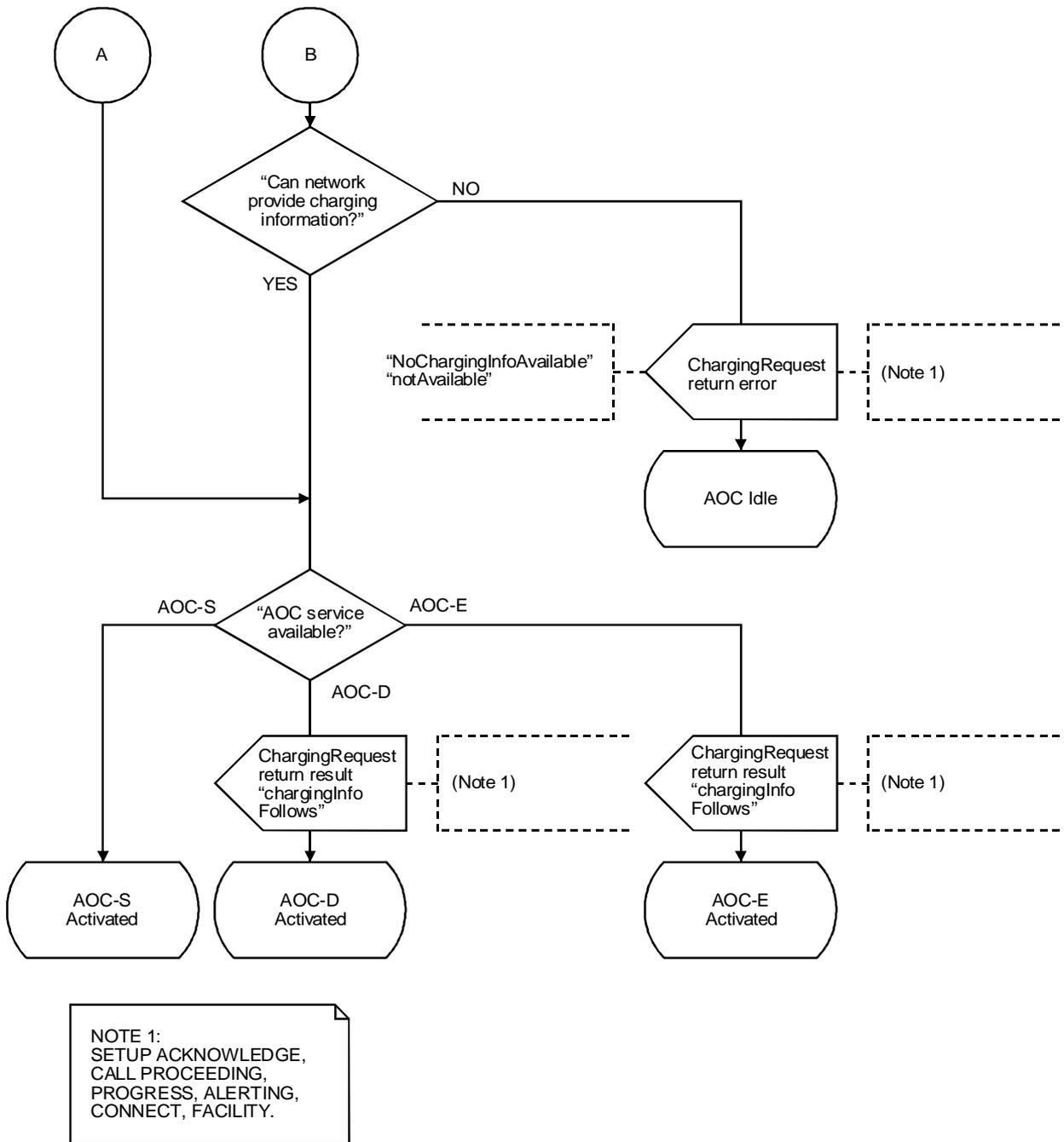
NOTE 1:  
 SETUP ACKNOWLEDGE,  
 CALL PROCEEDING,  
 PROGRESS, ALERTING,  
 CONNECT, FACILITY,  
 DISCONNECT, RELEASE,  
 RELEASE COMPLETE,  
 SUSPEND ACKNOWLEDGE,  
 RESUME ACKNOWLEDGE,  
 RESUME REJECT.

FIGURE 2-2/Q.956



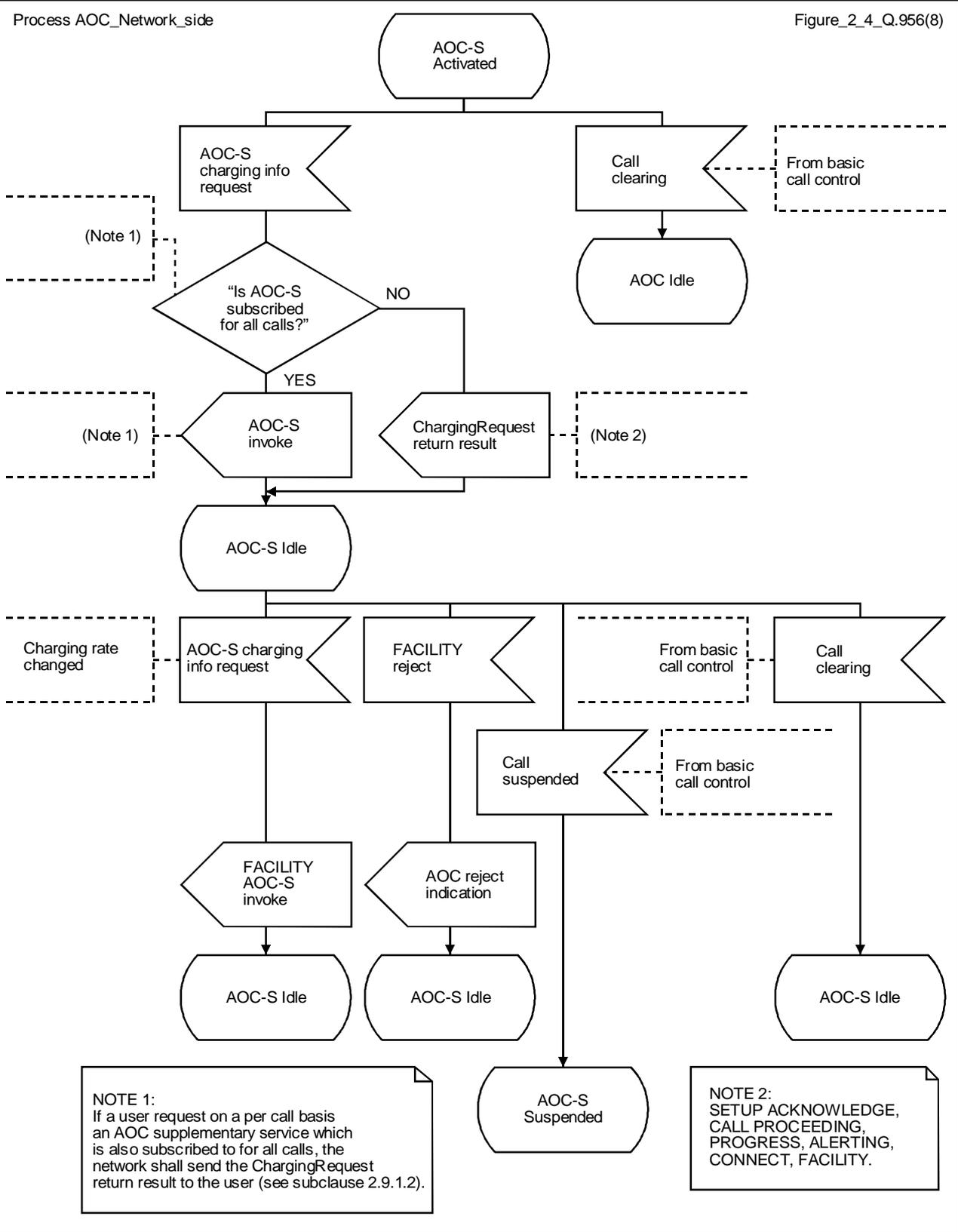
T1167400-94/d03

FIGURE 2-3/Q.956 (sheet 1 of 2)



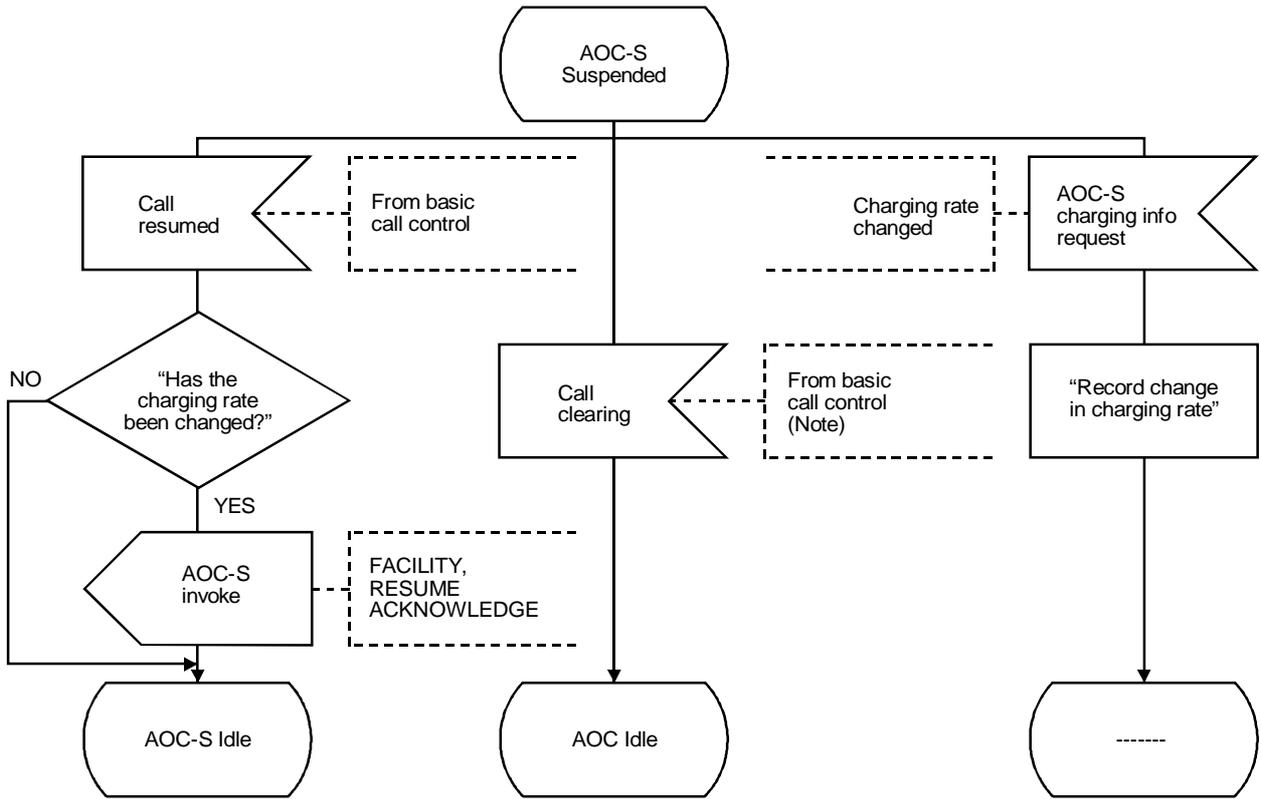
T1167410-94/d04

FIGURE 2-3/Q.956 (sheet 2 of 2)



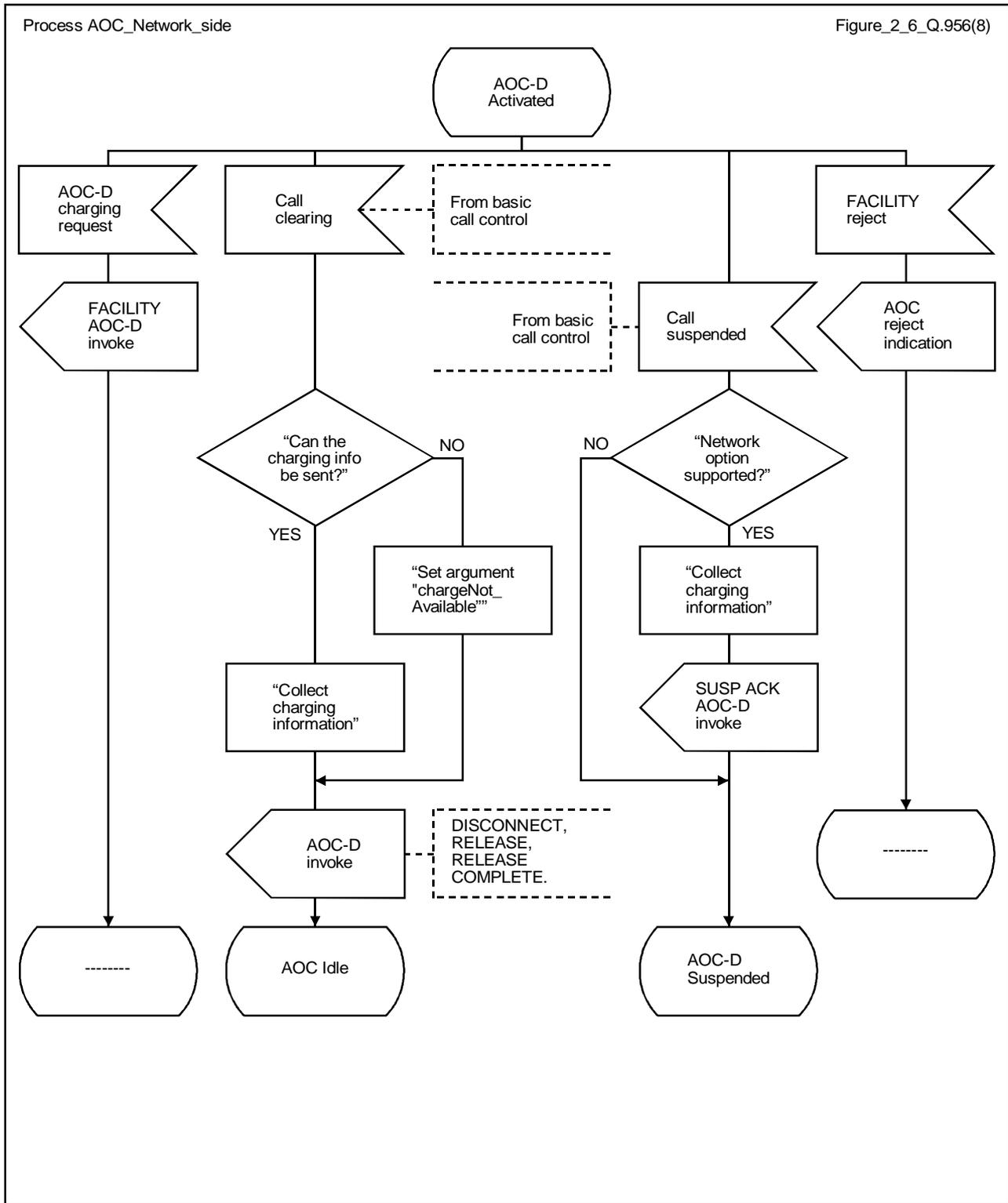
T1167420-94/d05

FIGURE 2-4/Q.956



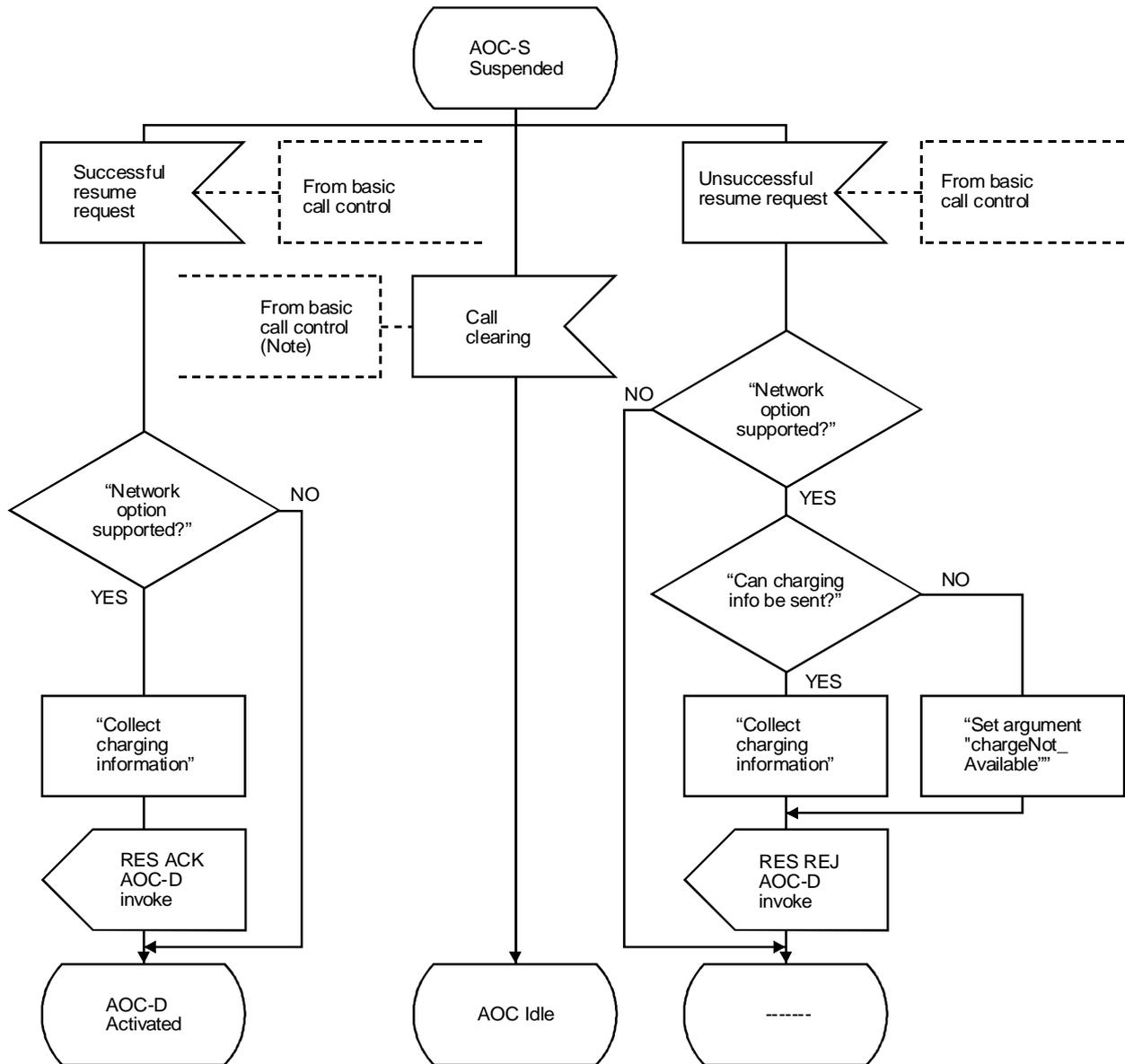
NOTE:  
 Depending on the implemented basic call option for retention of cause with the call identity when basic call is cleared, this action may occur at the release of the call identity, rather than the clearing of the call.

FIGURE 2-5/Q.956



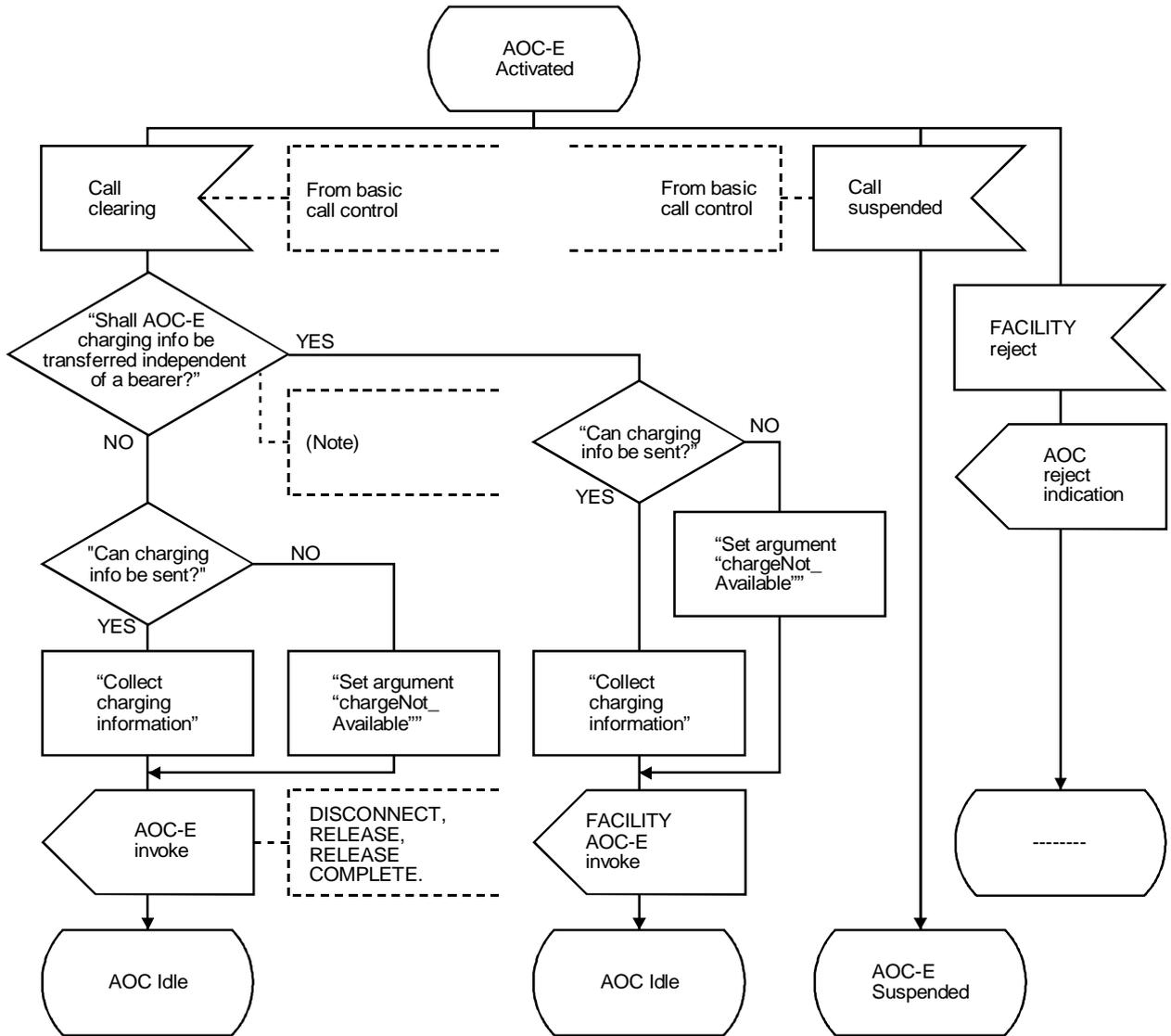
T1167440-94/d07

FIGURE 2-6/Q.956



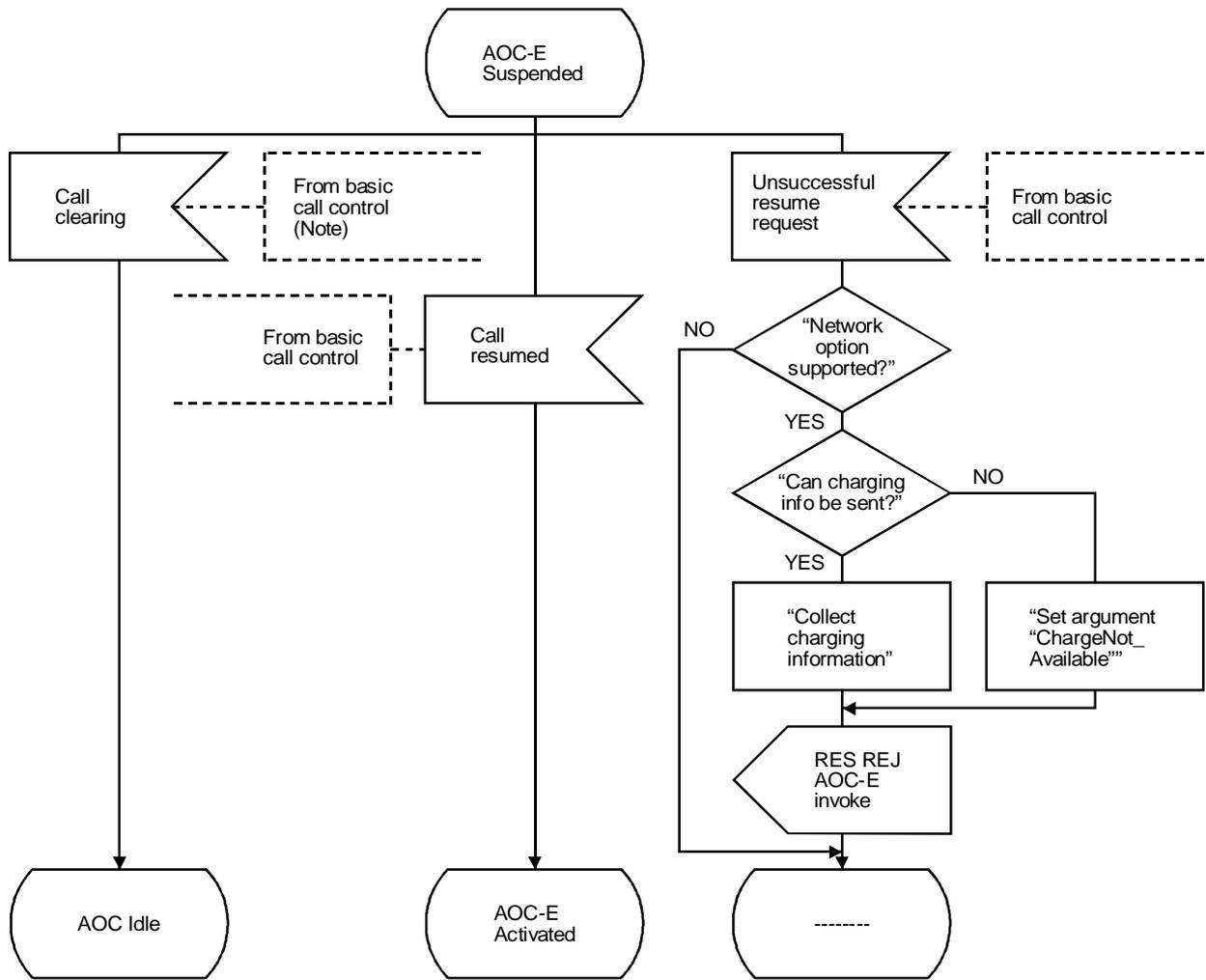
NOTE:  
 Depending on the implemented basic call option for retention of cause with the call identity when basic call is cleared, this action may occur at the release of the call identity rather than the clearing of the call.

FIGURE 2-7/Q.956



T1167460-94/d09

FIGURE 2-8/Q.956



**NOTE:**  
 Depending on the implemented basic call option for retention of cause with the call identity when basic call is cleared, this action may occur at the release of the call identity rather than the clearing of the call.

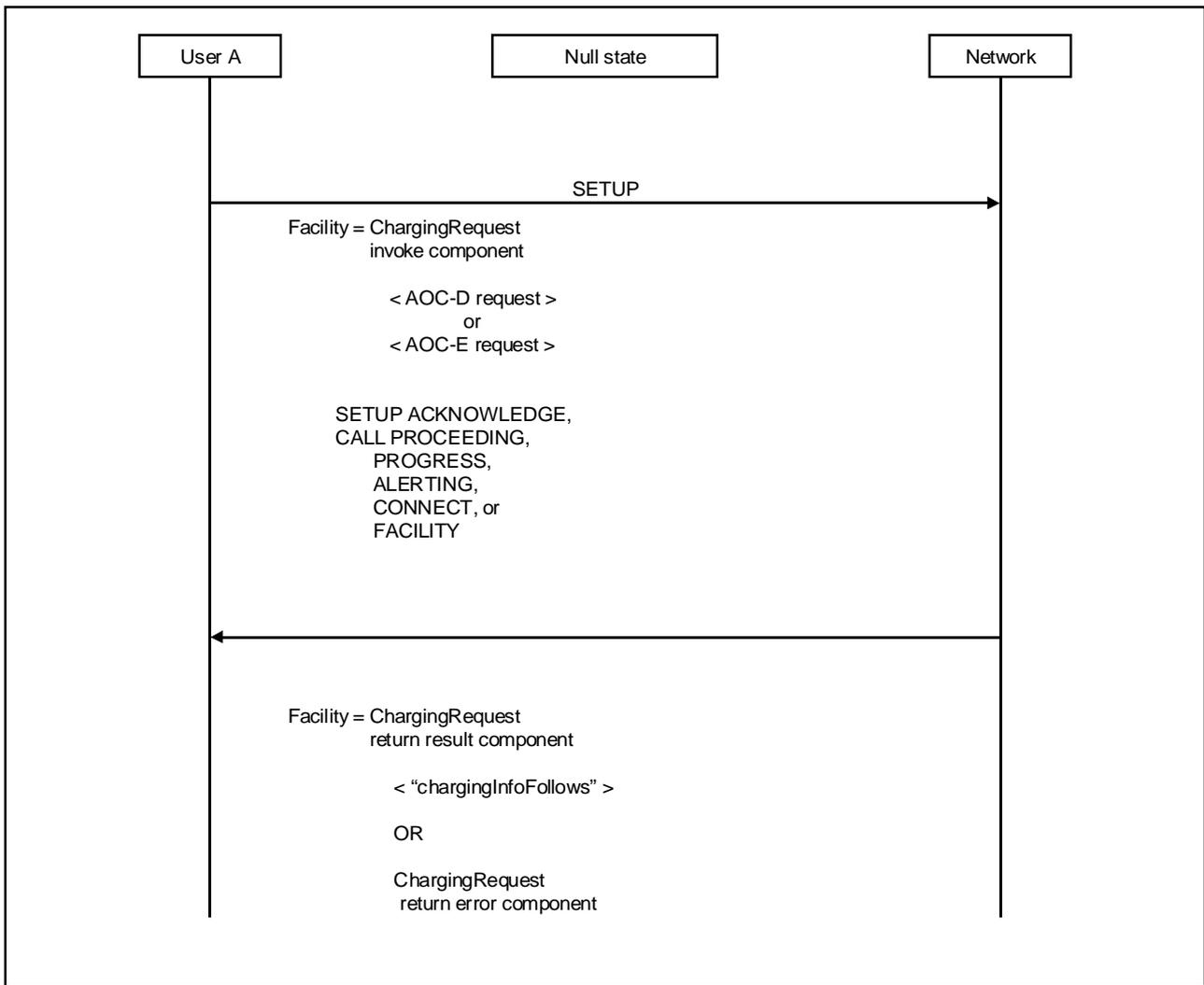
FIGURE 2-9/Q.956

# Appendix I

## Signalling flows

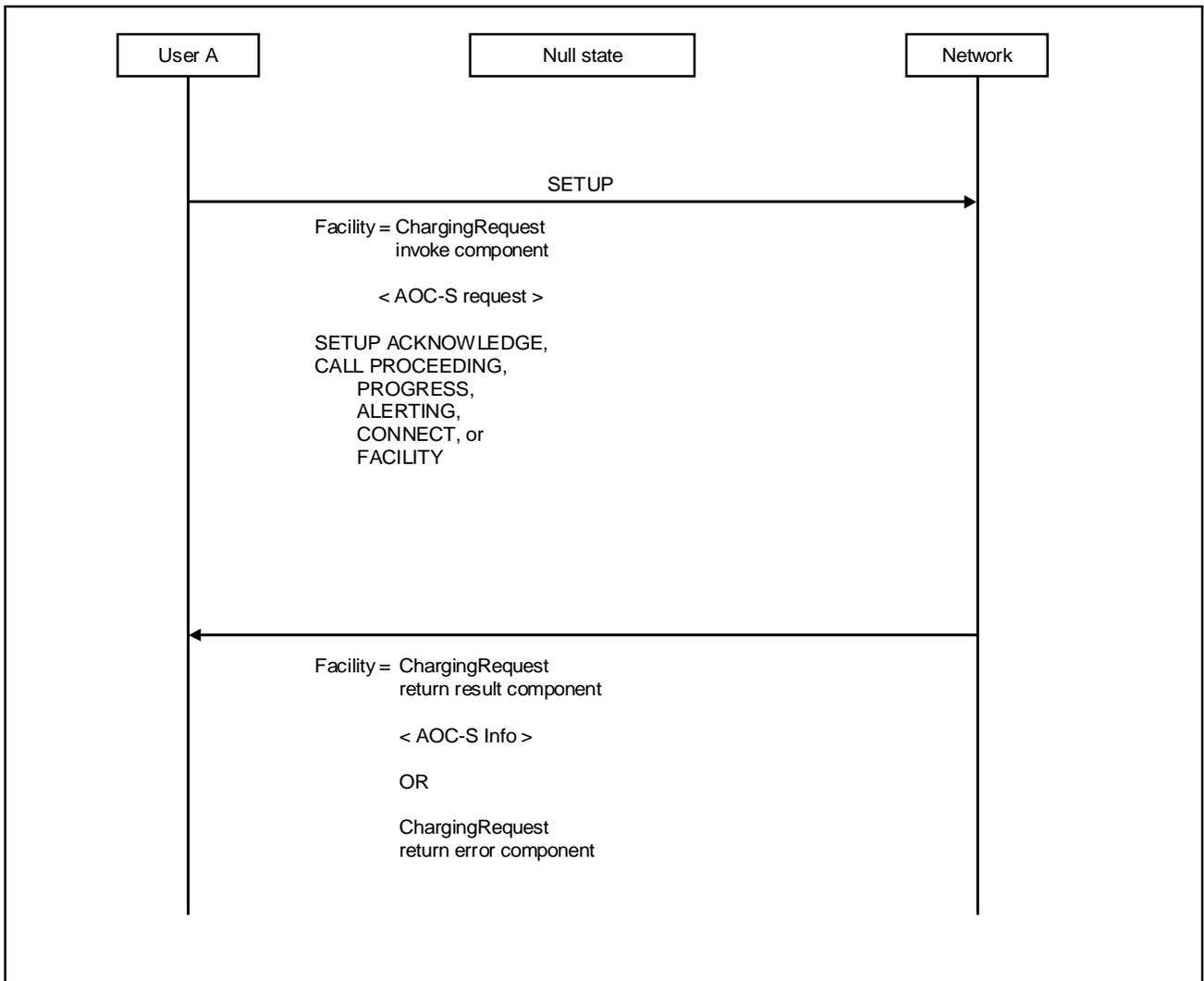
(This appendix does not form an integral part of this Recommendation)

In the following signalling flows, it is assumed that the local exchange has knowledge about the charging rate or the charges applied to a particular call. This does not exclude the possibility for the local exchange to collect this information from another point in the network. The signalling flows across the user-network interface will be the same for both cases. See Figures 2-I.1 to 2-I.11.



T1167480-94/d11

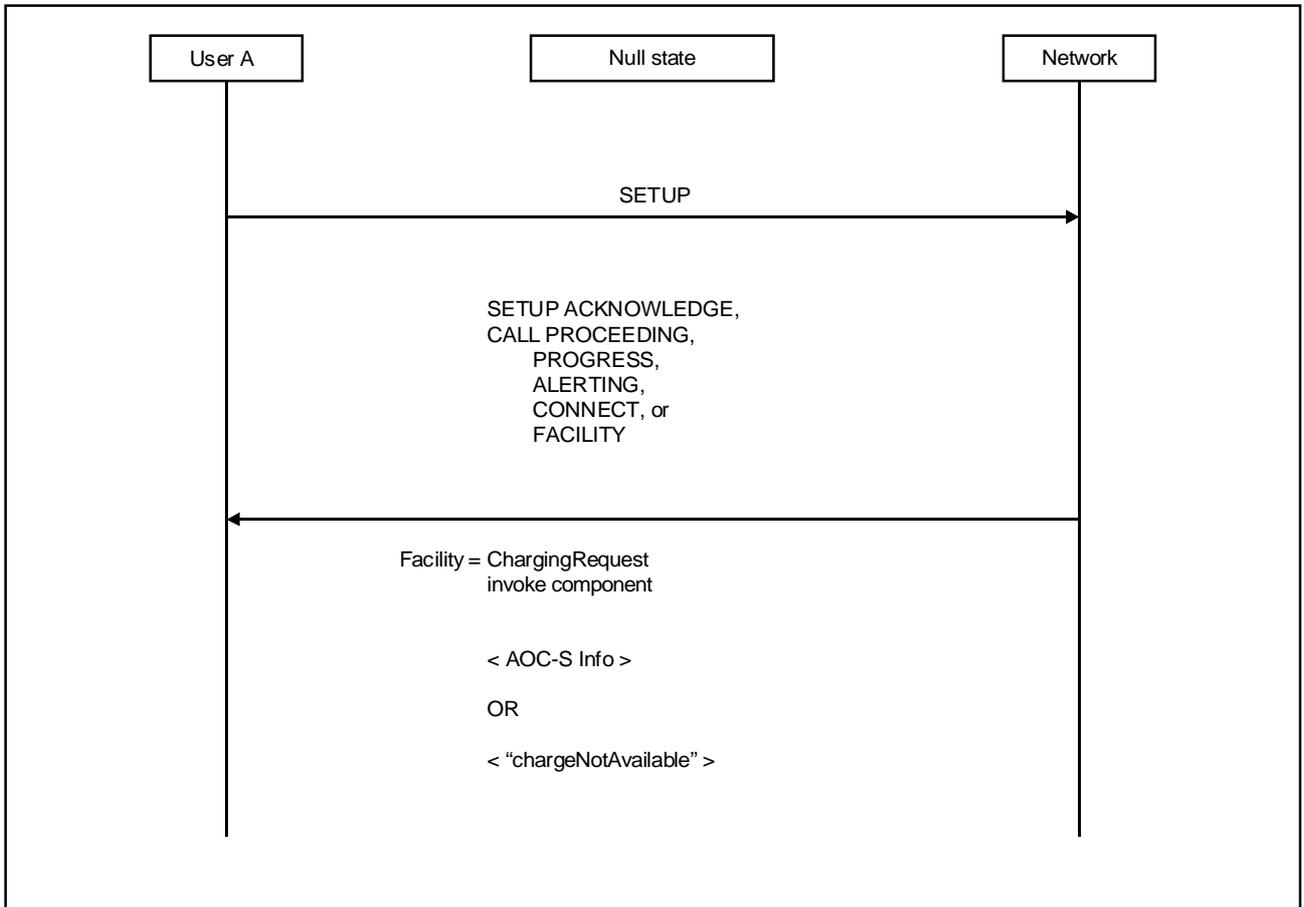
FIGURE 2-I.1/Q.956  
AOC-D or AOC-E request procedure during call establishment



T1167490-94/d12

FIGURE 2-I.2/Q.956

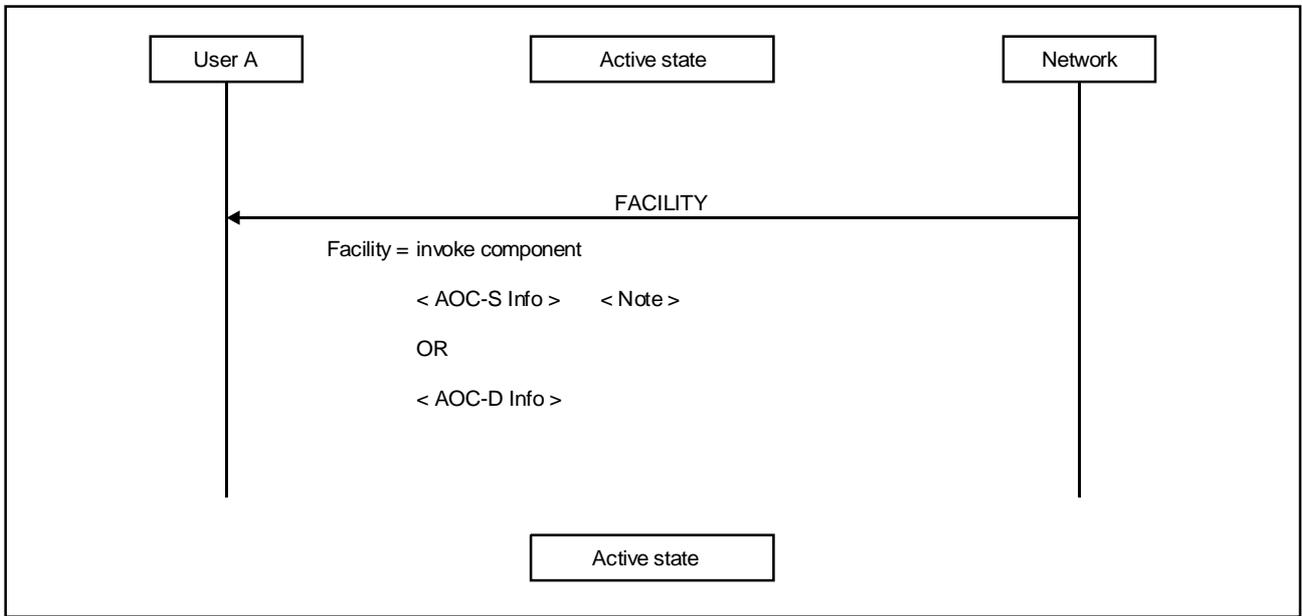
Information about charging rates during call establishment – AOC-S activated on a per call basis



T1167500-94/d13

FIGURE 2-I.3/Q.956

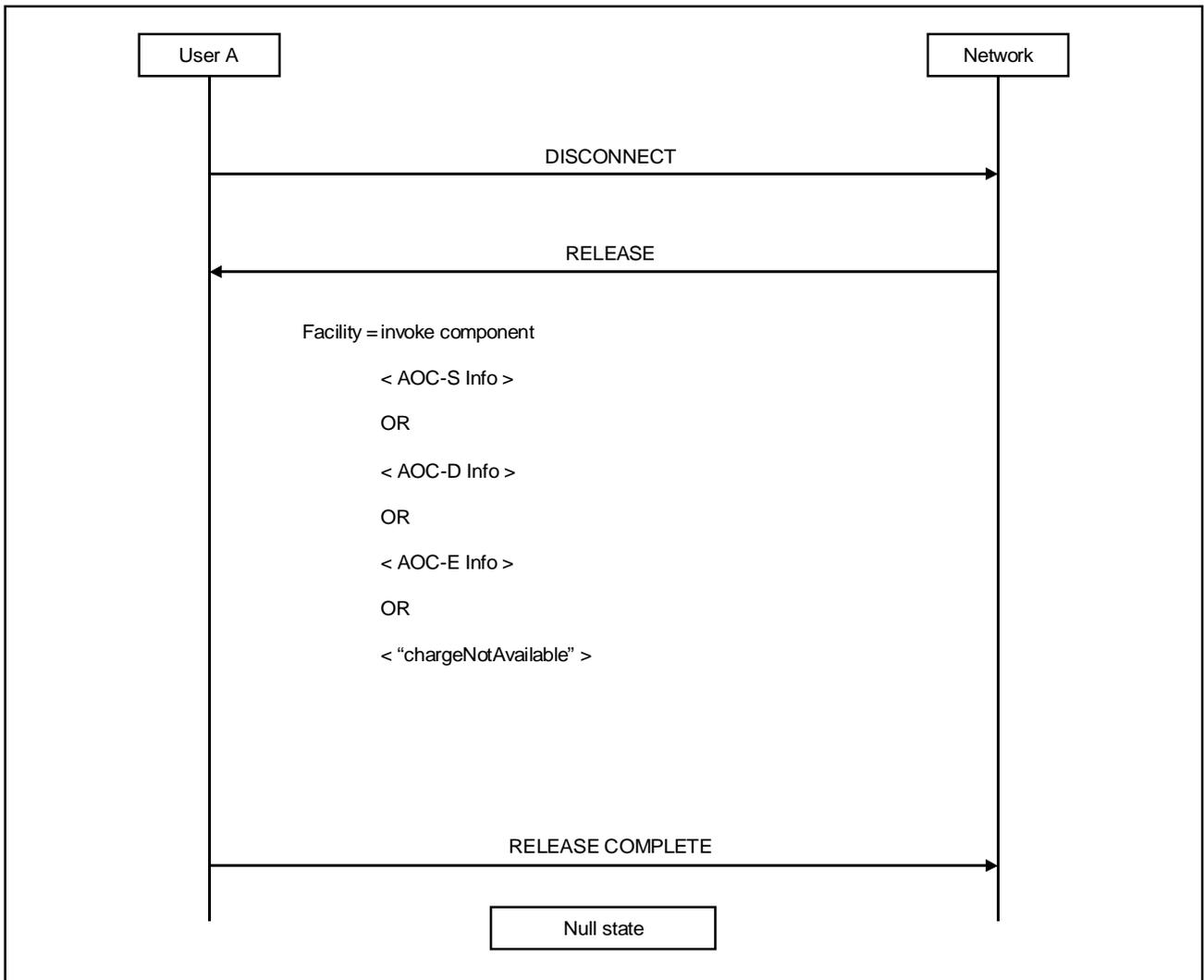
Information about charging rates during call establishment – AOC-S activated for all calls



T1167510-94/d14

NOTE – Only sent if a change in the charging rate has occurred.

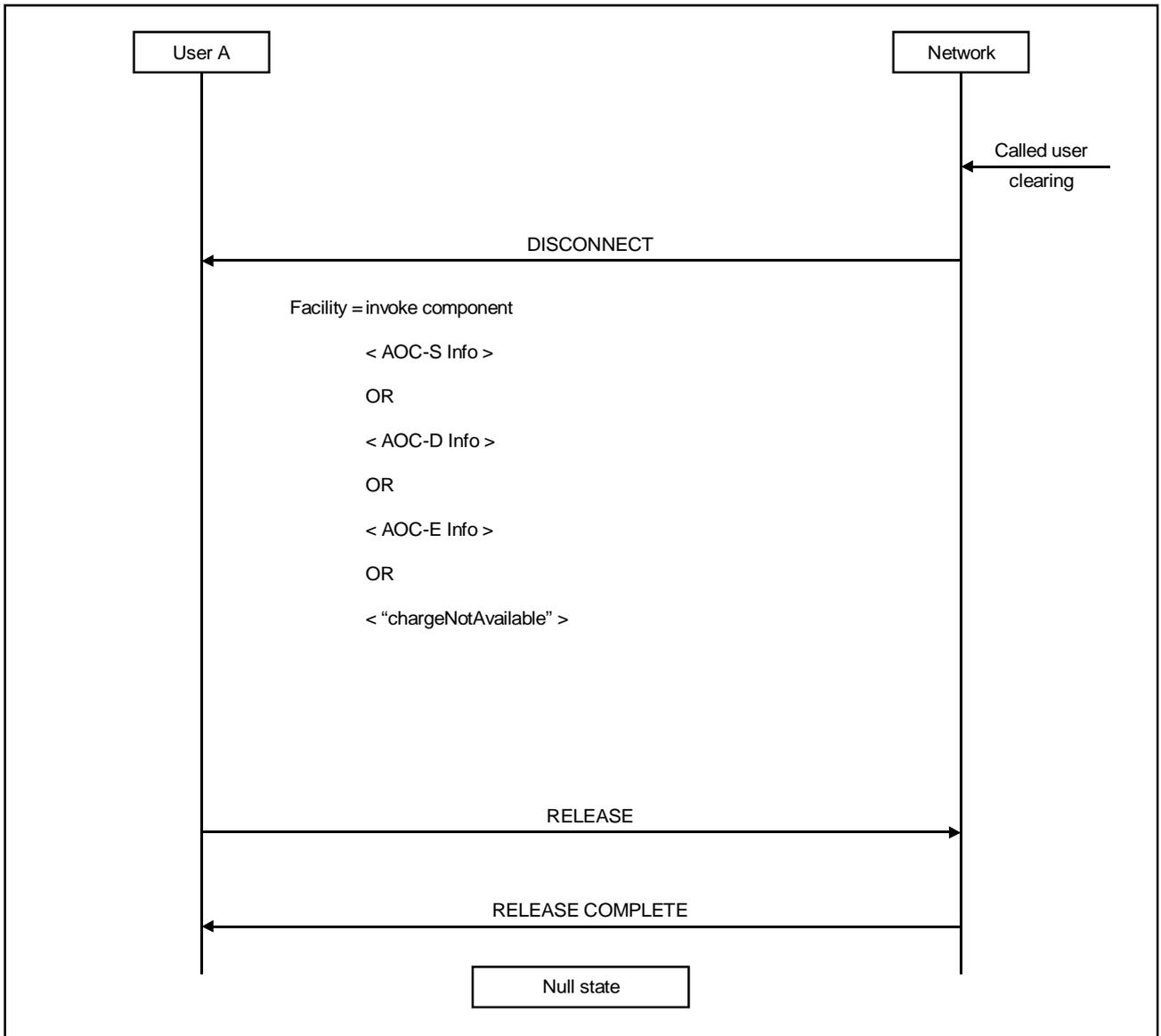
FIGURE 2-I.4/Q.956  
**Transfer of charging information during the Active state of a call**



T1167520-94/d15

FIGURE 2-I.5/Q.956

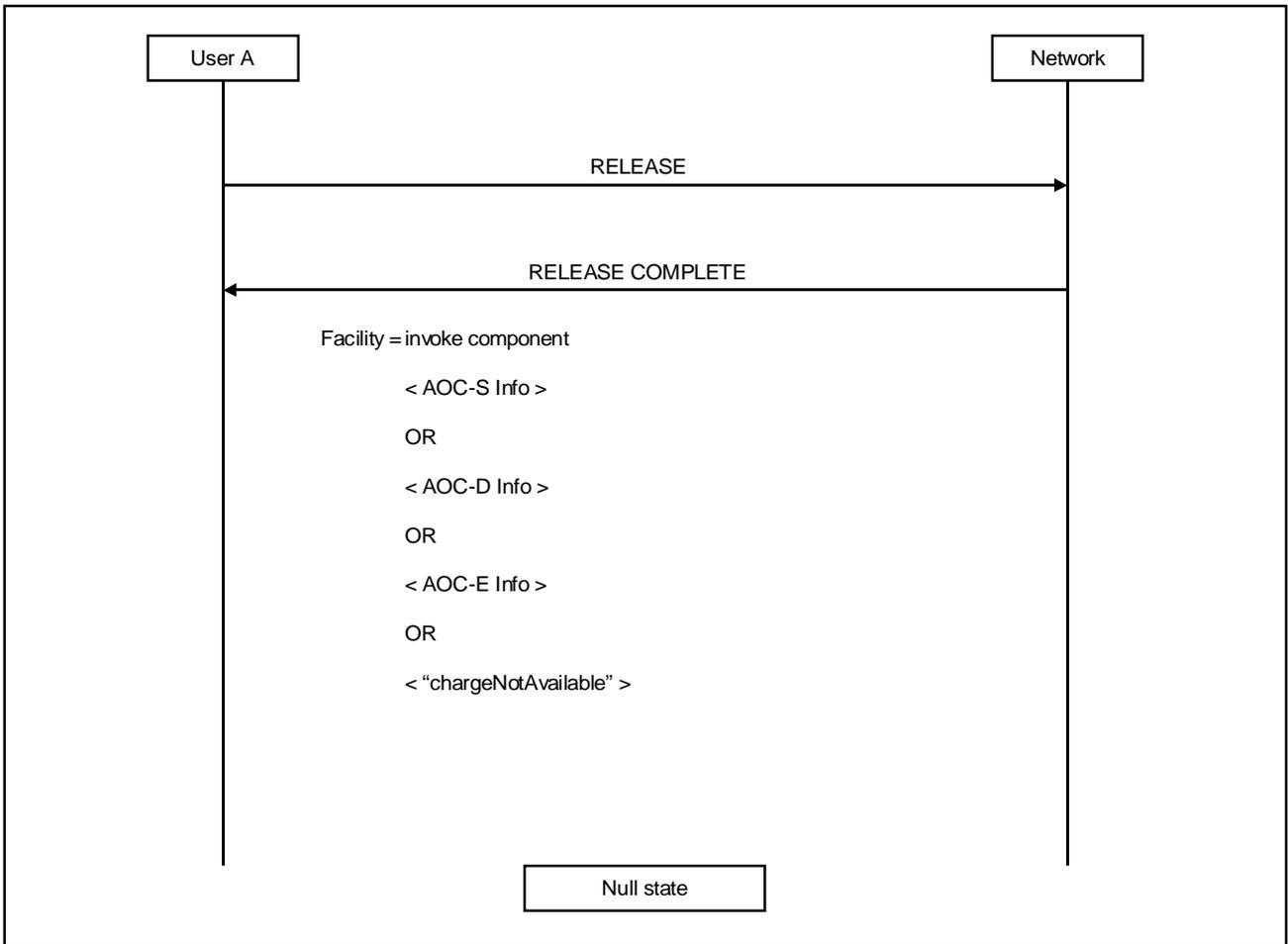
Transfer of charging information during the call clearing phase, clearing initiated by the calling user



T1167530-94/d16

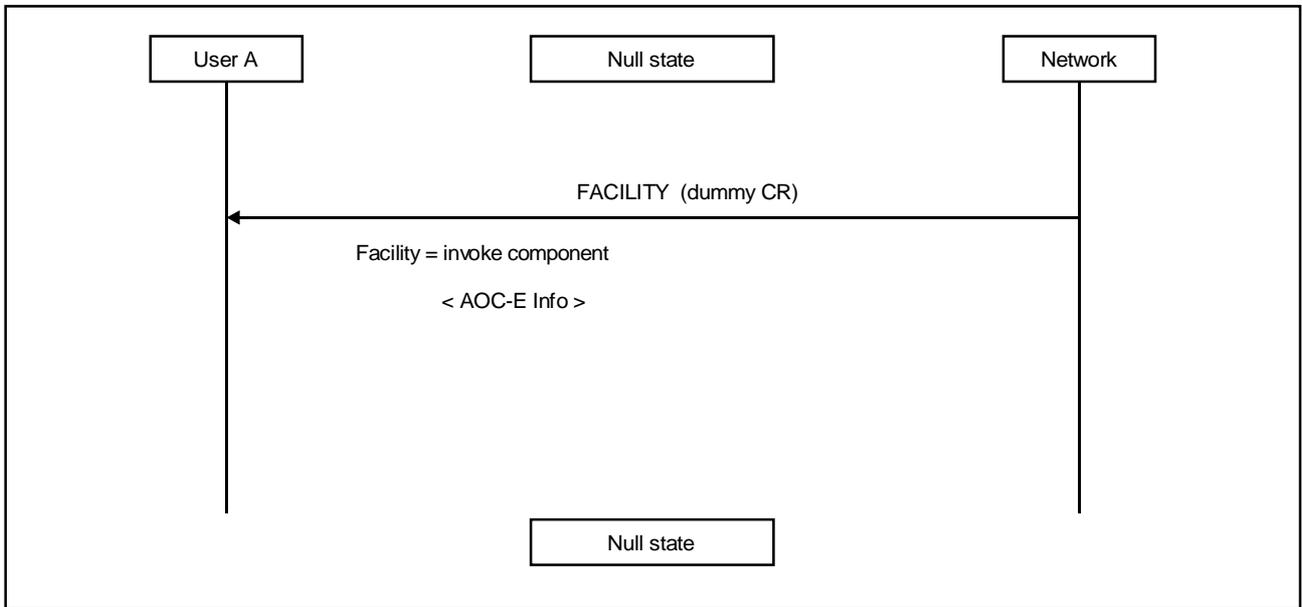
FIGURE 2-I.6/Q.956

Transfer of charging information during the call clearing phase, clearing initiated by the called user



T1167540-94/d17

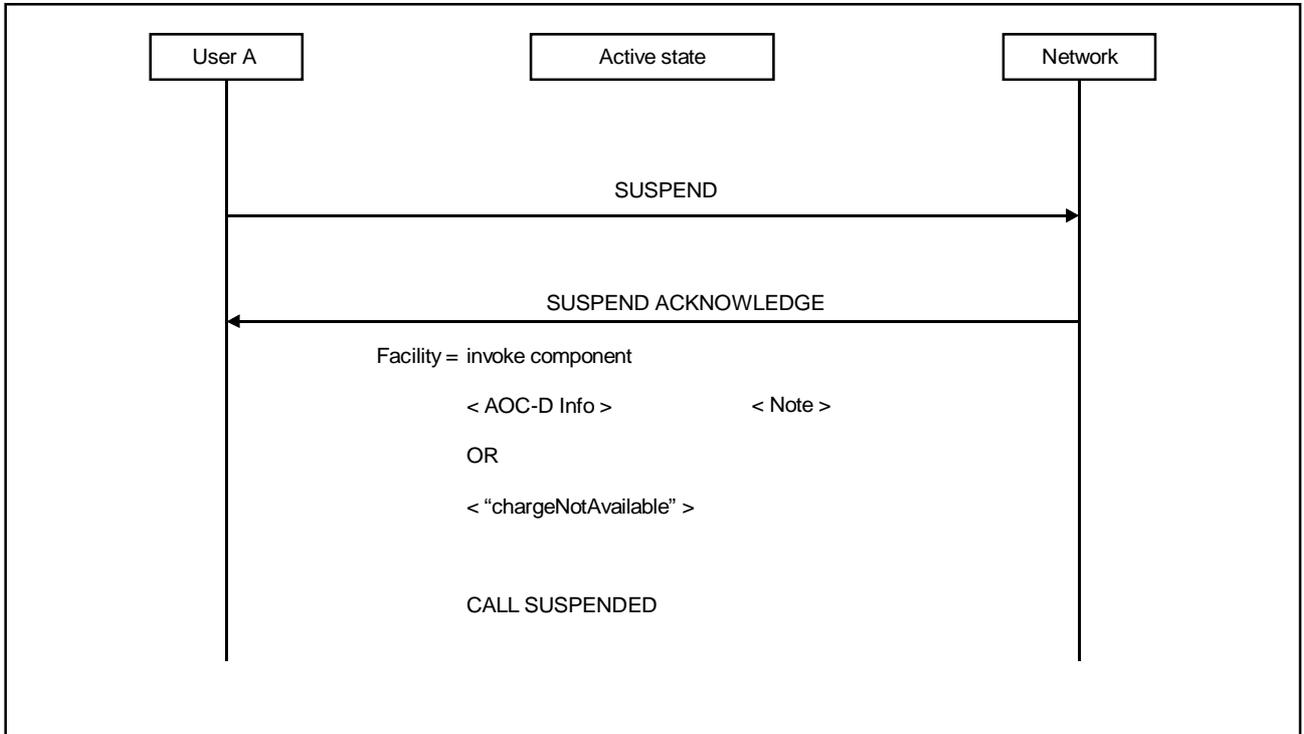
FIGURE 2-I.7/Q.956  
**Transferring charging information in case the network receives a RELEASE message  
 as the first message in the release procedure**



T1167550-94/d18

FIGURE 2-I.8/Q.956

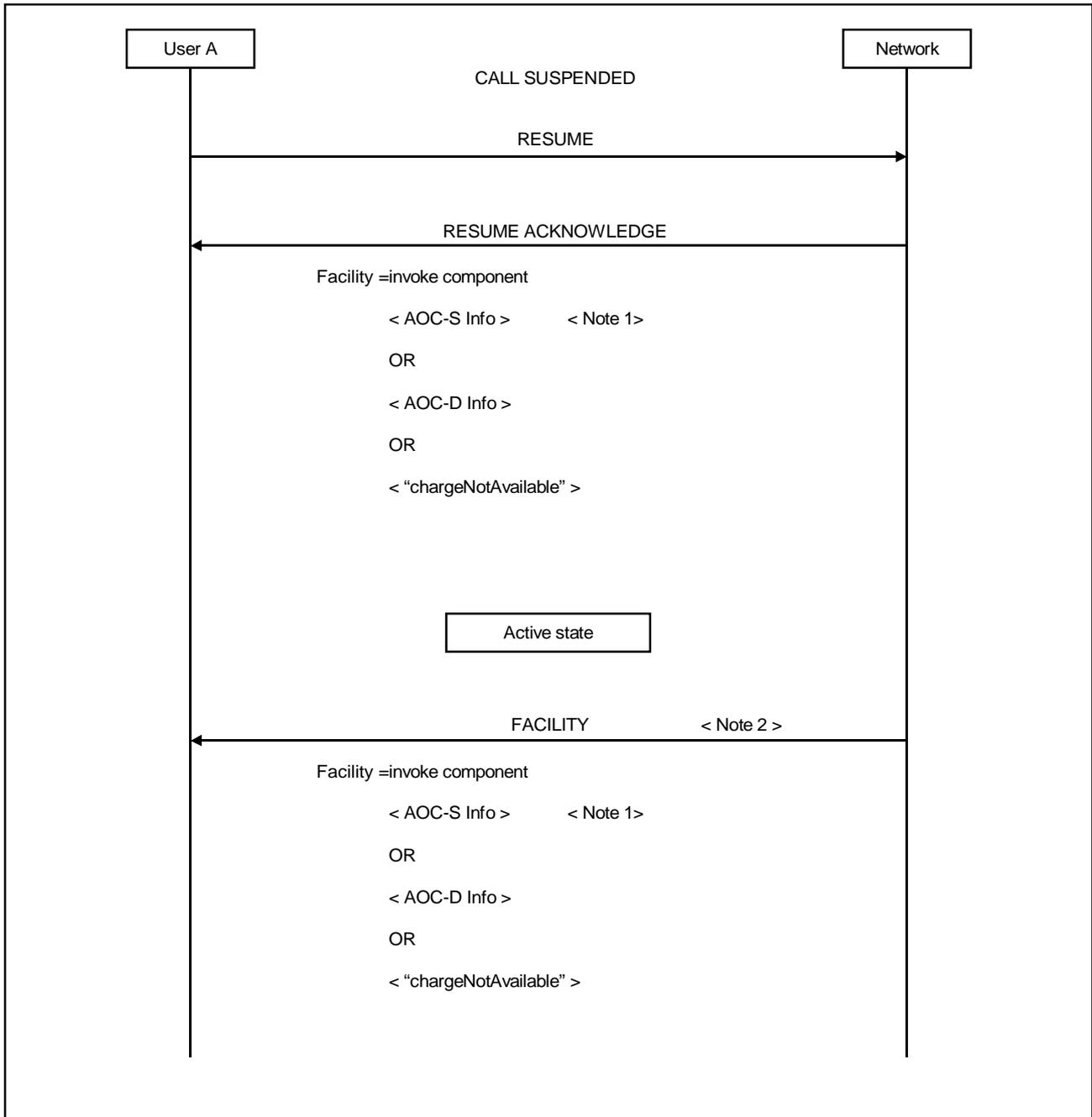
**Transfer of charging information independent of a bearer at the user-network interface**



T1167560-94/d19

NOTE – Cumulative charging information can be sent to the served user, as a network option.

FIGURE 2-I.9/Q.956  
**Transfer of charging information in the call suspension phase**

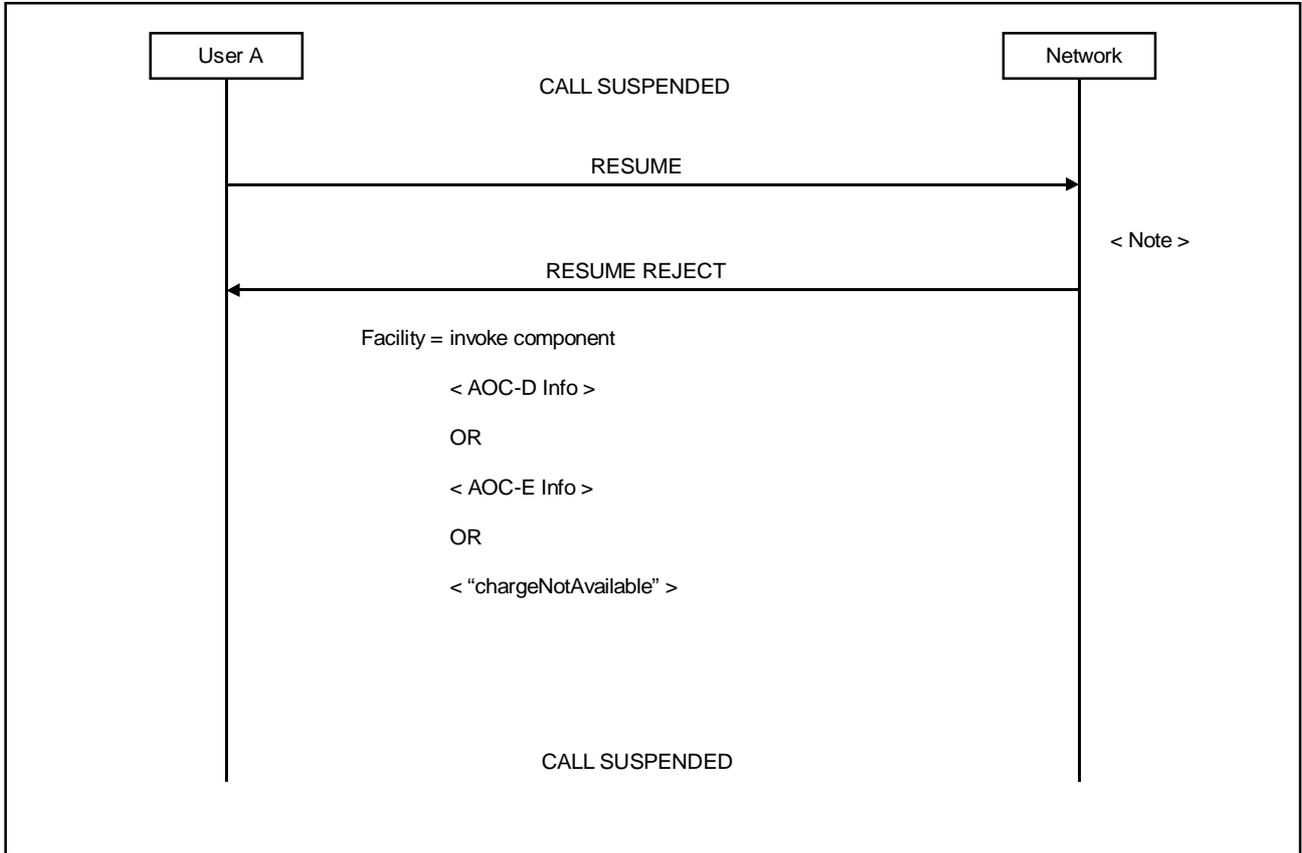


T1167570-94/d20

NOTES

- 1 Only provided if there is a change in the charging rate during the suspension time.
- 2 The first FACILITY message following the RESUME ACKNOWLEDGE message – only used if the charging information has not already been sent in the RESUME ACKNOWLEDGE message. This is a network option.

FIGURE 2-I.10/Q.956  
**Transfer of charging information in the call resumption phase**



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NOTE – It is a network option to provide this capability. The network has retained the call identity of the suspended call. If the network shall send charging information, the charging information must be available for the duration of the call identity retention timer.

FIGURE 2-I.11/Q.956  
**Transfer of charging information in the case of a call resume reject**