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# Integrated Services Digital Network (ISDN); Message Waiting Indication (MWI) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

**ETSI**

European Telecommunications Standards Institute

**ETSI Secretariat**

**Postal address:** F-06921 Sophia Antipolis CEDEX - FRANCE
**Office address:** 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
**X.400:** c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

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## Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS is part 1 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Message Waiting Indication (MWI) supplementary service, as described below:

**Part 1: "Protocol specification";**

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "TSS&TP specification for the network";

Part 6: "ATS and partial PIXIT proforma specification for the network".

In accordance with CCITT Recommendation I.130, the following three level structure is used to describe the supplementary telecommunication services as provided by European public telecommunications operators under the pan-European ISDN:

- Stage 1: is an overall service description, from the user's standpoint;

- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and

- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

This ETS details the stage 3 aspects (signalling system protocols and switching functions) needed to support the MWI supplementary service. The stage 1 aspects are detailed in ETS 300 650.

| **Proposed transposition dates** | |
|---|---|
| Date of latest announcement of this ETS (doa): | 3 months after ETSI publication |
| Date of latest publication of new National Standard or endorsement of this ETS (dop/e): | 6 months after doa |
| Date of withdrawal of any conflicting National Standard (dow): | 6 months after doa |

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# 1 Scope

This first part of ETS 300 745 specifies the stage three of the Message Waiting Indication (MWI) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [10]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [8]).

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

This ETS does not specify the additional protocol requirements where the service is provided to the user via a telecommunication network that is not an ISDN but it does include interworking requirements of other networks with the public ISDN.

The MWI supplementary service is provided independently of a call and is therefore not applicable to any specific telecommunication service.

Charging principles are outside the scope of this ETS.

The MWI supplementary service enables e.g. a mail box user, to be indicated that there are messages in the mail box.

Further parts of this ETS specify the method of testing required to identify conformance to this ETS.

This ETS is applicable to equipment supporting the MWI 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 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 195-1: "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2] ETS 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[3] ETS 300 207-1: "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[4] ETS 300 403-1 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[5] ETS 300 403-2 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2: Specification and Description Language (SDL) diagrams".

[6] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".

[7] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".

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

[9] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

[10] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

[11] CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

[12] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".

[13] CCITT Recommendation X.219 (1988): "Remote Operations: Model, notation and service definition".

[14] CCITT Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

## 3 Definitions

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

**basic access:** See CCITT Recommendation Q.9 [11], definition 1551.

**basic call procedures:** The procedures by which a call (as an instance of a telecommunications service) is established and terminated.

**Integrated Services Digital Network (ISDN):** See ITU-T Recommendation I.112 [7], definition 308.

**ISDN number:** A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [6].

**mail box:** A system, inside or outside the public network infrastructure, capable to handle mail.

NOTE 1: The definition of the mail box and its service are outside the scope of this ETS.

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

**public network:** The DSS1 protocol entity at the network side of the user-network interface at the T reference point.

**primary rate access:** See CCITT Recommendation Q.9 [11], definition 1552.

**private network:** The DSS1 protocol entity at the user side of the user-network interface at the T reference point.

**service; telecommunication service:** See ITU-T Recommendation I.112 [7], definition 201.

**supplementary service:** See ITU-T Recommendation I.210 [9], subclause 2.4.

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

**user A (receiving user):** The user that receives the message waiting indication.

**user B (controlling user):** The user that is subscribed to the MWI supplementary service and activates and deactivates the message waiting indication.

NOTE 2: The controlling user is likely to be a voice mail box.

# 4 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

| | |
|---|---|
| ASN.1 | Abstract Syntax Notation One |
| DSS1 | Digital Subscriber Signalling System No. one |
| ISDN | Integrated Services Digital Network |
| MWI | Message Waiting Indication |
| SDL | Specification and Description Language |

# 5 Description

The MWI supplementary service shall be available to users who are connected to the network via a basic access or primary rate access.

User A (receiving user) can receive an indication that at least one message is available in his/her voice mail box. As a receiving user's subscription option this indication can be given:

- when the service is activated for a certain basic service and user A makes an outgoing call; or,

- as soon as the service has been activated.

User B (controlling user) can activate and deactivate the message waiting indication when appropriate.

# 6 Operational requirements

## 6.1 Provision and withdrawal

The MWI supplementary service shall be provided to the controlling user after prior arrangements with the service provider. The MWI supplementary service shall be withdrawn at the controlling user's request, or for administrative reasons.

The MWI supplementary service shall be provided to the receiving user after prior arrangements with the service provider. The MWI supplementary service shall be withdrawn at the user's request, or for administrative reasons.

## 6.2 Requirements on the receiving user's network side

The network shall register whether the procedures of clause 9 or clause 10 of this ETS shall apply.

## 6.3 Requirements on the controlling user's network side

The network shall register whether the procedures of clause 9 or clause 10 of this ETS shall apply.

# 7 Coding requirements

## 7.1 Coding of the facility information element components

The operations and errors required for the message waiting indication supplementary services are defined in ASN.1 as specified in CCITT Recommendation X.208 [12] using the OPERATION and ERROR macros as defined in figure 4/X.219 of CCITT Recommendation X.219 [13].

The formal definition of the component types to encode these operations and errors is provided in ETS 300 196-1 [2], clause D.1.

The inclusion of components in Facility information elements is defined in ETS 300 196-1 [2], subclause 11.2.2.1.

All components (invoke, return result, return error and reject) shall be included within a Facility information element. This Facility information element may be included in any appropriate message as specified in ETS 300 196-1 [2], subclause 8.3.1.1, unless a more restrictive specification is given in clause 9 of this ETS.

```
MWI-Operations-and-Errors {ccitt identified-organization etsi(0) 745 operations-and-errors(1)}

DEFINITIONS EXPLICIT TAGS ::=

BEGIN

EXPORTS     MWIActivate,
            MWIDeactivate,
            MWIIndicate,
            InvalidReceivingUserNr,
            ReceivingUserNotSubscribed;

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

            notSubscribed,
            supplementaryServiceInteractionNotAllowed,
            resourceUnavailable,
            invalidServedUserNr
            FROM General-Errors
                {ccitt identified-organization etsi(0) 196 general-errors(2)}

            BasicService
            From Basic-Service-Elements
                {ccitt identified-organization etsi(0) 196 basic-service-elements(8)}

            PartyNumber
            FROM Addressing-Data-Element
                {ccitt identified-organization etsi(0) 196 addressing-data-elements(6)}

            NotActivated
            FROM Diversion-Operations
                {ccitt identified-organization etsi(0) 207 operations-and-errors(1)}
;

MWIActivate     ::= OPERATION
                    ARGUMENT SEQUENCE {
                        receivingUserNr         PartyNumber,
                        controllingUserNr       PartyNumber,
                        basicService            BasicService,
                        numberOfMessages        MessageCounter  OPTIONAL,
                        originalCallingUserNr   PartyNumber     OPTIONAL,
                        time                    GeneralizedTime OPTIONAL}
                    RESULT
                    ERRORS {
                        notSubscribed,
                        notAvailable,
                        supplementaryServiceInteractionNotAllowed,
                        resourceUnavailable,
                        invalidReceivingUserNr,
                        invalidServedUserNr,
                        receivingUserNotSubscribed,
                        controllingUserNotRegistered,
                        notConfirmed }
-- End of MWIActivate operation definition
```

```
MWIDeactivate   ::= OPERATION
                    ARGUMENT SEQUENCE {
                        receivingUserNr         PartyNumber,
                        controllingUserNr       PartyNumber,
                        basicService            BasicService}
                    RESULT
                    ERRORS {
                        notSubscribed,
                        notAvailable,
                        supplementaryServiceInteractionNotAllowed,
                        resourceUnavailable,
                        invalidReceivingUserNr,
                        invalidServedUserNr,
                        notActivated,
                        receivingUserNotSubscribed,
                        controllingUserNotRegistered,
                        notConfirmed }
-- End of MWIDeactivate operation definition

MWIIndicate     ::= OPERATION
                    ARGUMENT SEQUENCE {
                        controllingUserNr       PartyNumber,
                        basicService            BasicService,
                        numberOfMessages        MessageCounter  OPTIONAL,
                        originalCallingUserNr   PartyNumber     OPTIONAL,
                        time                    GeneralizedTime OPTIONAL}
                RESULT
-- End of MWIIndicate operation definition

InvalidReceivingUserNr          ::= ERROR
ReceivingUserNotSubscribed      ::= ERROR
ControllingUserNotRegistered    ::= ERROR

MessageCounter                  ::= INTEGER (0..65535)

GeneralizedTime                 ::= [UNIVERSAL 24] IMPLICIT VisibleString

mWIOID OBJECT IDENTIFIER        ::= {ccitt identified-organization etsi(0) 745
                                     operations-and-errors(1)}

mWIActivate                     MWIActivate                     ::= globalValue {mWIOID 1}
mWIDeactivate                   MWIDeactivate                   ::= globalValue {mWIOID 2}
mWIIndicate                     MWIIndicate                     ::= globalValue {mWIOID 3}

invalidReceivingUserNr          InvalidReceivingUserNr          ::= globalValue {mWIOID 10}
receivingUserNotSubscribed      ReceivingUserNotSubscribed      ::= globalValue {mWIOID 11}
controllingUserNotRegistered    ControllingUserNotRegistered    ::= globalValue {mWIOID 12}
notConfirmed                    NotConfirmed                    ::= globalValue {mWIOID 13}

notActivated                    NotActivated                    ::= localValue 46

END -- MWI-Operations-and-Errors
```

# 8 State definitions

Table 1 defines the states for the MWI supplementary service.

**Table 1: States for MWI supplementary service**

| **User B states** | |
|---|---|
| Idle | The MWI supplementary service is idle |
| Wait Activation | The user has requested activation and is waiting for a response |
| Wait Deactivation | The user has requested deactivation and is waiting for a response |
| **Network states** | |
| Idle | The MWI supplementary service is idle |
| Wait Activation | The network has received activation request |
| Wait Deactivation | The network has received deactivation request |

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

## 9.1 Activation at the user B interface

### 9.1.1 Normal operation

To activate the MWI supplementary service, user B shall send a MWIActivate invoke component to the network and start T-ACTIVATE using the procedure described in subclause 10.2.2.1 of ETS 300 196-1 [2].

User B shall indicate:

- in the "controllingUserNr" parameter, the ISDN number of user B from which the MWI service activation is requested;

- in the "basicService" parameter, the basic service to which the activation of the MWI supplementary service activation applies;

- in the "receivingUserNr" parameter, the ISDN number of user A for which the activation applies; and,

- optionally, in the "numberOfMessages" parameter the number of messages present;

- optionally, in the "originalCallingUserNr" parameter the ISDN number of the originating user of the last message; and,

- optionally, in the "time parameter" the local date and time of the last message.

On receipt of an MWIActivate invoke component the network shall use the basicService, controllingUserNr and receivingUserNr parameters to decide which instance of the MWI supplementary service shall be activated. When this instance of the MWI supplementary service is already active, the new activation shall replace the existing activation.

When accepting the activation, the network shall activate the service for user A and send a MWIActivate return result component to user B using the procedures of subclause 10.2.2.1 of ETS 300 196-1 [2].

When user B receives a correctly encoded MWIActivate return result component, then user B shall accept the provided information and the MWI supplementary service is successfully activated.

### 9.1.2 Exceptional procedures

If the network is not able to activate the MWI supplementary service, the network shall send a MWIActivate return error component to user B within a Facility information element, using the procedure in subclause 10.2.2.2 of ETS 300 196-1 [2], indicating one of the following error values:

- "notSubscribed", if (for a given ISDN number or for the whole access) the MWI supplementary service has not been subscribed to by the controlling user;

- "notAvailable", if the MWI supplementary service is not available for the indicated basic service;

- "invalidReceivingUserNr", if the ISDN number provided to identify user A is not a valid number;

- "supplementaryServiceInteractionNotAllowed", if the provision of the MWI supplementary service is precluded by a procedure within ETS 300 195-1 [1], clause 5;

- "resourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available. This error value shall be used when the maximum number of activations for user A has been reached and a further activation has been requested;

- "invalidServedUserNr", if the ISDN number provided to identify user B is not a valid number;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user;

- “controllingUserNotRegistered”, if the controlling user is not allowed to activate the MWI supplementary service for the receiving user;

- “notConfirmed”, if option b) applies for the receiving user and no confirmation has been received from the receiving user.

On expiration of timer T-ACTIVATE and user B not having received any response to the MWIActivate invoke component, user B shall consider that this attempt to activate the MWI supplementary service has failed.

If a reject component is received and the invoke identifier is included, user B or the network shall ignore this component.

### 9.2 Deactivation at the user B interface

#### 9.2.1 Normal operation

To deactivate the MWI supplementary service, user B shall send a MWIDeactivate invoke component to the network and start timer T-DEACTIVATE using the procedures described in subclause 10.2.3.1 of ETS 300 196-1 [2].

User B shall indicate:

- in the "controllingUserNr" parameter, the ISDN number of user B from which the MWI service deactivation is requested;

- in the "basicService" parameter, the basic service to which the deactivation of the MWI supplementary service activation applies; and,

- in the "receivingUserNr" parameter, the ISDN number of user A for which the deactivation applies.

On receipt of an MWIDeactivate invoke component the network shall use the basicService, controllingUserNr and receivingUserNr parameters to decide which instance of the MWI supplementary service shall be deactivated.

When accepting the deactivation, the network shall deactivate the service for user B and send a MWIDeactivate return result component to user B using the procedures of subclause 10.2.3.1 of ETS 300 196-1 [2].

When user B receives a correctly encoded MWIDeactivate return result component, then user B shall accept the provided information and the MWI supplementary service is successfully deactivated.

#### 9.2.2 Exceptional procedures

If the network is unable to deactivate the MWI supplementary service, the network shall send a MWIDeactivate return error component to user B within a Facility information element, using the procedure described in subclause 10.2.3.2 of ETS 300 196-1 [2], indicating one of the following error values:

- "notSubscribed", if (for a given ISDN number or for the whole access) the MWI supplementary service has not been subscribed to by the controlling user;

- "notAvailable", if the MWI supplementary service is not available for the indicated basic service;

- "invalidReceivingUserNr", if the ISDN number provided to identify user A is not a valid number;

- "supplementaryServiceInteractionNotAllowed", if the provision of the MWI supplementary service is precluded by a procedure within ETS 300 195-1 [1], clause 5;

- "resourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidServedUserNr", if the ISDN number provided to identify user B is not a valid number;

- "notActivated", if the MWI supplementary service is not activated;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user;

- “controllingUserNotRegistered”, if the controlling user is not allowed to deactivate the MWI supplementary service for the receiving user;

- “notConfirmed”, if option b) applies for the receiving user and no confirmation has been received from the receiving user.

On expiration of timer T-DEACTIVATE and user B not having received any response to the MWIDeactivate invoke component, user B shall consider that this attempt to deactivate the MWI supplementary service has failed and that the MWI supplementary service is still activated.

If a reject component is received and the invoke identifier is included, user B or the network shall ignore this component.

### 9.3 Invocation of the MWI to user A

#### 9.3.1 Normal operation

As a receiving user’s subscription option, two modes of invocation are available:

a) invocation when the receiving user makes an outgoing call; and,

b) invocation immediately after activation.

When mode a) applies and if the MWI supplementary service has been activated for user A and the network receives a SETUP message from user A, then the network shall send a MWIIndicate invoke component for each active instance of the MWI supplementary service for user A to user A in a Facility information element according to the procedures of subclause 8.3.2.4 of ETS 300 196-1 [2]. The information provided shall be independent of the basic service indicated in the SETUP message.

The network shall indicate:

- in the "controllingUserNr" parameter the ISDN number of user B;

- in the "basicService" parameter, the basic service to which the invocation of the MWI supplementary service applies; and,

- if provided by user B, the number of messages present in the "numberOfMessages" parameter;

- if provided by user B, in the "originalCallingUserNr" parameter the ISDN number of the originating user of the last message; and,

- if provided by user B, in the "time" parameter the local date and time of the last message.

NOTE: After having finalized or released the call, user A can make a new outgoing call to his mailbox to play the registered messages.

On receipt of a correctly encoded MWIIndicate invoke component, user A shall accept the provided information.

When mode b) applies, then after activation of an instance of the MWI supplementary service, the network shall send a MWIIndicate invoke component to the receiving user in a Facility information element according to the procedures of subclause 8.3.2.4 of ETS 300 196-1 [2] and shall start timer T-CONFIRM.

The network shall indicate:

- in the "controllingUserNr" parameter the ISDN number of user B;

- in the "basicService parameter", the basic service to which the invocation of the MWI supplementary service applies; and,

- if provided by user B, the number of messages present in the "numberOfMessages" parameter;

- if provided by user B, in the "originalCallingUserNr" parameter the ISDN number of the originating user of the last message; and,

- if provided by user B, in the "time" parameter the local date and time of the last message.

  NOTE: After having finalized or released the call, user A can make a new outgoing call to his mailbox to play the registered messages.

When mode b) applies, then after deactivation of the MWI supplementary service, the network shall send a MWIIndicate invoke component to the receiving user in a Facility information element according to the procedures of subclause 8.3.2.4 of ETS 300 196-1 [2] and shall start timer T-CONFIRM.

The network shall indicate:

- in the "controllingUserNr" parameter the ISDN number of user B;

- in the "basicService" parameter, the basic service to which the invocation of the MWI supplementary service applies;

- in the "numberOfMessages" parameter the value 0; and,

- the network shall not include the "originalCallingUserNr" and "time" parameters.

On receipt of a MWIIndicate invoke component, the receiving user shall respond by sending a MWIIndicate return result component in a Facility information element according to the procedures of subclause 8.3.2.2 of ETS 300 196-1 [2].

On receipt of a MWIIndicate return result component and if option b) applies, the (de)activation shall be considered complete, timer T-CONFIRM shall be stopped and the controlling user shall be informed accordingly. Subsequent MWIIndicate return results components received by the network shall be ignored.

### 9.3.2 Exceptional procedures

If a reject component is received and the invoke identifier is included, the network shall ignore this component.

In case timer T-CONFIRM expires the requested (de)activation shall be considered as not successful and the controlling user shall be informed that the request has not been confirmed by the receiving user.

# 10 Procedures for interworking with private ISDNs

## 10.1 Activation of the message waiting indication where the controlling user resides in a private network

### 10.1.1 Normal procedures

When the private network is informed that the controlling user requests activation of the message waiting indication, the private network shall send a MWIActivate invoke component to the public network and start timer T-ACTIVATE using the procedure described in subclause 8.3.2.1.1 of ETS 300 196-1 [2].

The private network shall indicate:

- in the "controllingUserNr" parameter, the ISDN number of the controlling user from which the MWI supplementary service activation is requested;

- in the "basicService" parameter, the basic service to which the activation of the MWI supplementary service activation applies;

- in the "receivingUserNr" parameter, the ISDN number of the private network user A for which the activation applies; and,

- if provided by user B, the number of messages present in the "numberOfMessages" parameter;

- if provided by user B, in the "originalCallingUserNr" parameter the ISDN number of the originating user of the last message; and,

- if provided by user B, in the "time" parameter the local date and time of last message.

When accepting the activation, the public network shall send a MWIActivate return result component to the private network using the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

When the private network receives a correctly encoded MWIActivate return result component, then the private network shall stop timer T-ACTIVATE, accept the provided information and the MWI supplementary service is successfully activated. Furthermore the private network shall continue clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

### 10.1.2 Exceptional procedures

If the public network is not able to activate the MWI supplementary service, the public network shall send a MWIActivate return error component to the private network within a Facility information element, using the procedure in subclause 8.3.2.1.3 of ETS 300 196-1 [2], indicating one of the following error values:

- "notAvailable", if the MWI supplementary service is not available for the indicated basic service;

- "invalidReceivingUserNr", if the ISDN number provided to identify the private network user A is not a valid number;

- "supplementaryServiceInteractionNotAllowed", if the provision of the MWI supplementary service is precluded by a procedure within ETS 300 195-1 [1], clause 5;

- "resourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidServedUserNr", if the ISDN number provided to identify user B is not a valid number;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user;

- “controllingUserNotRegistered”, if the controlling user is not allowed to activate the MWI supplementary service for the receiving user;

- “notConfirmed”, if option b) applies for the receiving user and no confirmation has been received from the receiving user.

On receipt of a MWIActivate return error component, the private network shall stop T-ACTIVATE, forward the information to the controlling user and shall continue clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

On expiration of timer T-ACTIVATE and the private network not having received any response to the MWIActivate invoke component, the private network shall consider that this attempt to activate the MWI supplementary service has failed and initiate clearing of the signalling connection according to the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

NOTE: The message is still stored, but the public network user A will not get any indication.

If a reject component is received and the invoke identifier is included, the private network or public network shall ignore this component.

## 10.2 Deactivation of the message waiting indication where the controlling user resides in a private network

### 10.2.1 Normal procedures

When the private network is informed that the controlling user requests deactivation of the message waiting indication, the private network shall send a MWIDeactivate invoke component to the public network and start timer T-DEACTIVATE using the procedures described in subclause 8.3.2.1.1 of ETS 300 196-1 [2].

The private network shall indicate:

- in the "controllingUserNr" parameter, the ISDN number of the controlling user from which the MWI service deactivation is requested;

- in the "basicService" parameter, the basic service to which the deactivation of the MWI supplementary service activation applies; and,

- in the "receivingUserNr" parameter, the ISDN number of the private network user A for which the deactivation applies.

When accepting the deactivation, the public network shall send a MWIDeativate return result component to the private network using the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

When the private network receives a correctly encoded MWIDeactivate return result component, then the private network shall stop timer T-DEACTIVATE, accept the provided information and the MWI supplementary service is successfully deactivated. Furthermore, the private network shall continue call clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

### 10.2.2 Exceptional procedures

If the public network is unable to deactivate the MWI supplementary service, the public network shall send a MWIDeactivate return error component to the private network within a Facility information element, using the procedure described in subclause 8.3.2.1.3 of ETS 300 196-1 [2], indicating one of the following error values:

- "notAvailable", if the MWI supplementary service is not available for the indicated basic service;

- "invalidReceivingUserNr", if the ISDN number provided to identify the private network user A is not a valid number;

- "supplementaryServiceInteractionNotAllowed", if the provision of the MWI supplementary service is precluded by a procedure within ETS 300 195-1 [1], clause 5;

- "resourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidServedUserNr", if the ISDN number provided to identify user B is not a valid number;

- "notActivated", if the MWI supplementary service is not activated;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user;

- “controllingUserNotRegistered”, if the controlling user is not allowed to activate the MWI supplementary service for the receiving user;

- “notConfirmed”, if option b) applies for the receiving user and no confirmation has been received from the receiving user.

On receipt of a MWIDeactivate return error component, the private network shall stop T-DEACTIVATE, forward the information to the controlling user and shall continue clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

On expiration of timer T-DEACTIVATE and the private network not having received any response to the MWIDeactivate invoke component, the private network shall consider that this attempt to deactivate the MWI supplementary service has failed and that the MWI supplementary service is still activated and shall initiate clearing of the signalling connection according to the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

If a reject component is received and the invoke identifier is included, the private network or public network shall ignore this component.

## 10.3 Activation of the message waiting indication where the receiving user resides in a private ISDN

### 10.3.1 Normal operation

When the public network is informed that the controlling user requests activation of the message waiting indication, the public network shall send a MWIActivate invoke component to the private network and start timer T-ACTIVATE using the procedure described in subclause 8.3.2.1.1 of ETS 300 196-1 [2].

The public network shall indicate:

- in the "controllingUserNr" parameter, the ISDN number of the controlling user from which the MWI supplementary service activation is requested;

- in the "basicService" parameter, the basic service to which the activation of the MWI supplementary service activation applies;

- in the "receivingUserNr" parameter, the ISDN number of the private network user A for which the activation applies; and,

- if provided by user B, the number of messages present in the "numberOfMessages" parameter;

- if provided by user B, in the "originalCallingUserNr" parameter the ISDN number of the originating user of the last message; and,

- if provided by user B, in the "time" parameter the local date and time of last message.

When accepting the activation, the private network shall send a MWIActivate return result component to the public network using the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2]. Further actions to be taken by the private network are outside the scope of the ETS.

When the public network receives a correctly encoded MWIActivate return result component, then the public network shall stop timer T-ACTIVATE, accept the provided information and the MWI supplementary service is successfully activated. Furthermore the public network shall continue clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

### 10.3.2 Exceptional procedures

If the private network is not able to activate the MWI supplementary service, the private network shall send a MWIActivate return error component to the public network within a Facility information element, using the procedure in subclause 8.3.2.1.3 of ETS 300 196-1 [2], indicating one of the following error values:

- "notAvailable", if the MWI supplementary service is not available for the indicated basic service;

- "invalidReceivingUserNr", if the ISDN number provided to identify the private network user A is not a valid number;

- "supplementaryServiceInteractionNotAllowed", if the provision of the MWI supplementary service is precluded by a procedure within ETS 300 195-1 [1], clause 5;

- "resourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidServedUserNr", if the ISDN number provided to identify user B is not a valid number;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user;

- “controllingUserNotRegistered”, if the controlling user is not allowed to activate the MWI supplementary service for the receiving user;

- “notConfirmed”, if option b) applies for the receiving user and no confirmation has been received from the receiving user.

On receipt of a MWIActivate return error component, the public network shall stop T-ACTIVATE, forward the information to the controlling user and shall continue clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

On expiration of timer T-ACTIVATE and the public network not having received any response to the MWIActivate invoke component, the public network shall consider that this attempt to activate the MWI supplementary service has failed and initiate clearing of the signalling connection according to the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

NOTE: The message is still stored in the mail box, but the private network user A will not get any indication.

If a reject component is received and the invoke identifier is included, the private network or public network shall ignore this component.

## 10.4 Deactivation of the message waiting indication where the receiving user resides in a private ISDN

### 10.4.1 Normal procedures

When the public network is informed that the controlling user requests deactivation of the message waiting indication, the public network shall send a MWIDeactivate invoke component to the private network and start timer T-DEACTIVATE using the procedures described in subclause 8.3.2.1.1 of ETS 300 196-1 [2].

The public network shall indicate:

- in the "controllingUserNr" parameter, the ISDN number of the controlling user from which the MWI service deactivation is requested;

- in the "basicService" parameter, the basic service to which the deactivation of the MWI supplementary service activation applies; and,

- in the "receivingUserNr" parameter, the ISDN number of the private network user A for which the deactivation applies.

When accepting the deactivation, the private network shall send a MWIDeactivate return result component to the public network using the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

When the public network receives a correctly encoded MWIDeactivate return result component, then the public network shall stop timer T-DEACTIVATE, accept the provided information and the MWI supplementary service is successfully deactivated. Furthermore, the public network shall continue call clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

### 10.4.2 Exceptional procedures

If the private network is unable to deactivate the MWI supplementary service, the private network shall send a MWIDeactivate return error component to the public network within a Facility information element, using the procedure described in subclause 8.3.2.1.3 of ETS 300 196-1 [2], indicating one of the following error values:

- "notAvailable", if the MWI supplementary service is not available for the indicated basic service;

- "invalidReceivingUserNr", if the ISDN number provided to identify the private network user A is not a valid number;

- "supplementaryServiceInteractionNotAllowed", if the provision of the MWI supplementary service is precluded by a procedure within ETS 300 195-1 [1], clause 5;

- "resourceUnavailable", if the resources required to perform adequately the MWI supplementary service are not available;

- "invalidServedUserNr", if the ISDN number provided to identify user B is not a valid number;

- "notActivated", if the MWI supplementary service is not activated;

- "receivingUserNotSubscribed", if the MWI supplementary service has not been subscribed to by the receiving user;

- “controllingUserNotRegistered”, if the controlling user is not allowed to deactivate the MWI supplementary service for the receiving user;

- “notConfirmed”, if option b) applies for the receiving user and no confirmation has been received from the receiving user.

On receipt of a MWIDeactivate return error component, the public network shall stop T-DEACTIVATE, forward the information to the controlling user and shall continue clearing of the signalling connection according to subclause 8.3.2.1.3 of ETS 300 196-1 [2].

On expiration of timer T-DEACTIVATE and the public network not having received any response to the MWIDeactivate invoke component, the public network shall consider that this attempt to deactivate the MWI supplementary service has failed and that the MWI supplementary service is still activated and shall initiate clearing of the signalling connection according to the procedures of subclause 8.3.2.1.3 of ETS 300 196-1 [2].

If a reject component is received and the invoke identifier is included, the private network or public network shall ignore this component.

## 11 Interaction with other networks

No impact.

## 12 Interaction with other supplementary services

See ETS 300 195-1 [1].

## 13 Parameter values (timers)

The following values of the timers shall be used by this application when using the procedures of subclause 10.2 of ETS 300 196-1 [2].

T-ACTIVATE The duration of the timer shall be 10 seconds.

T-DEACTIVATE The duration of the timer shall be 10 seconds.

The following timer value shall be used by the procedures in subclause 9.3.1:

T-CONFIRM The duration of the timer shall be 4 seconds.

# 14 Dynamic description (SDL diagrams)

The dynamic description shown in figures 1 to 8 is according to CCITT Recommendation Z.100 [14].

## 14.1 Controlling user

### 14.1.1 Controlling user - user side

#### 14.1.1.1 Controlling user - user side (coincident S and T reference point)

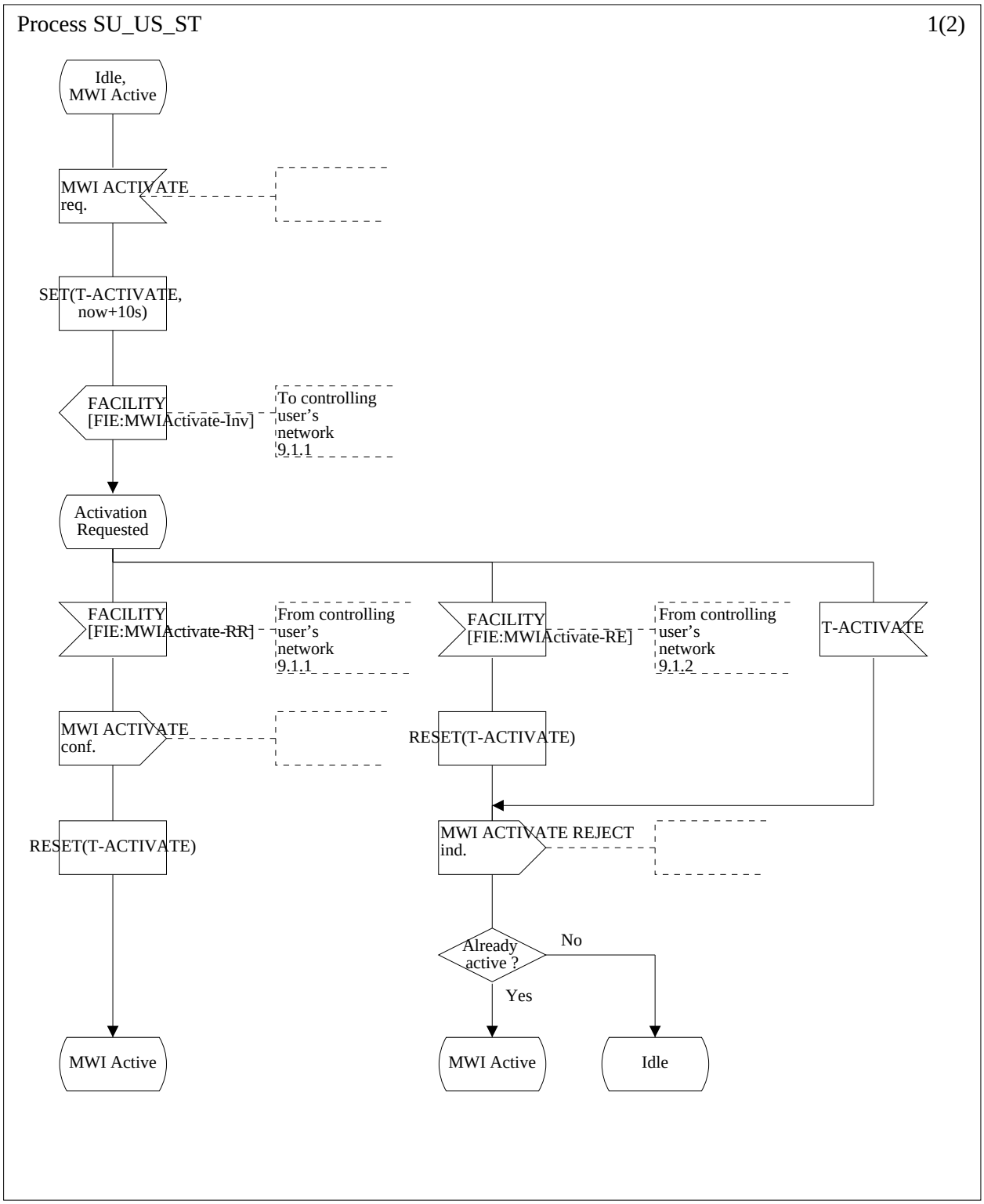


**Figure 1 (sheet 1 of 2): Process SU-US-ST**

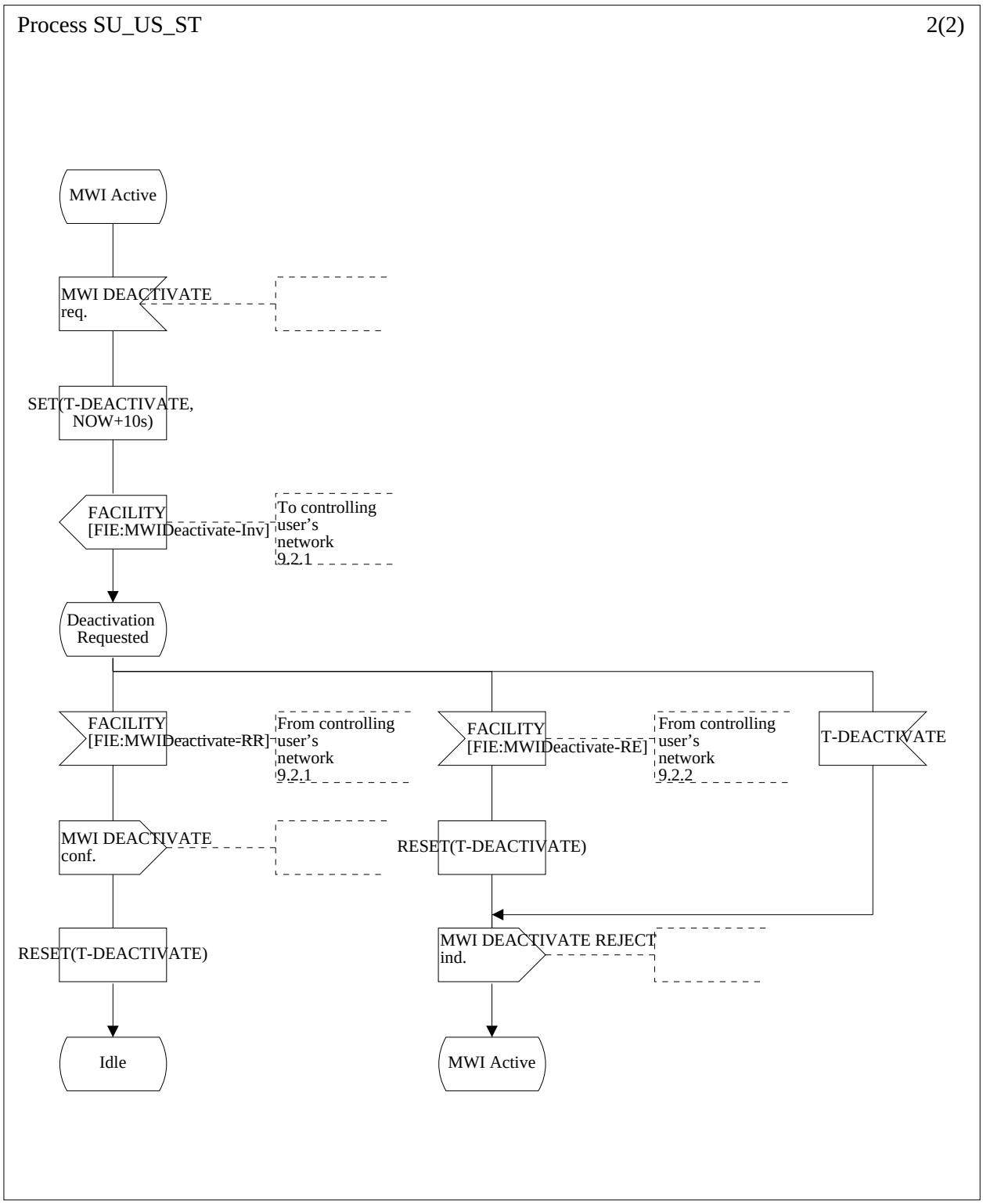


**Figure 1 (sheet 2 of 2): Process SU-US-ST**

### 14.1.1.2 Controlling user - user side (T reference point)

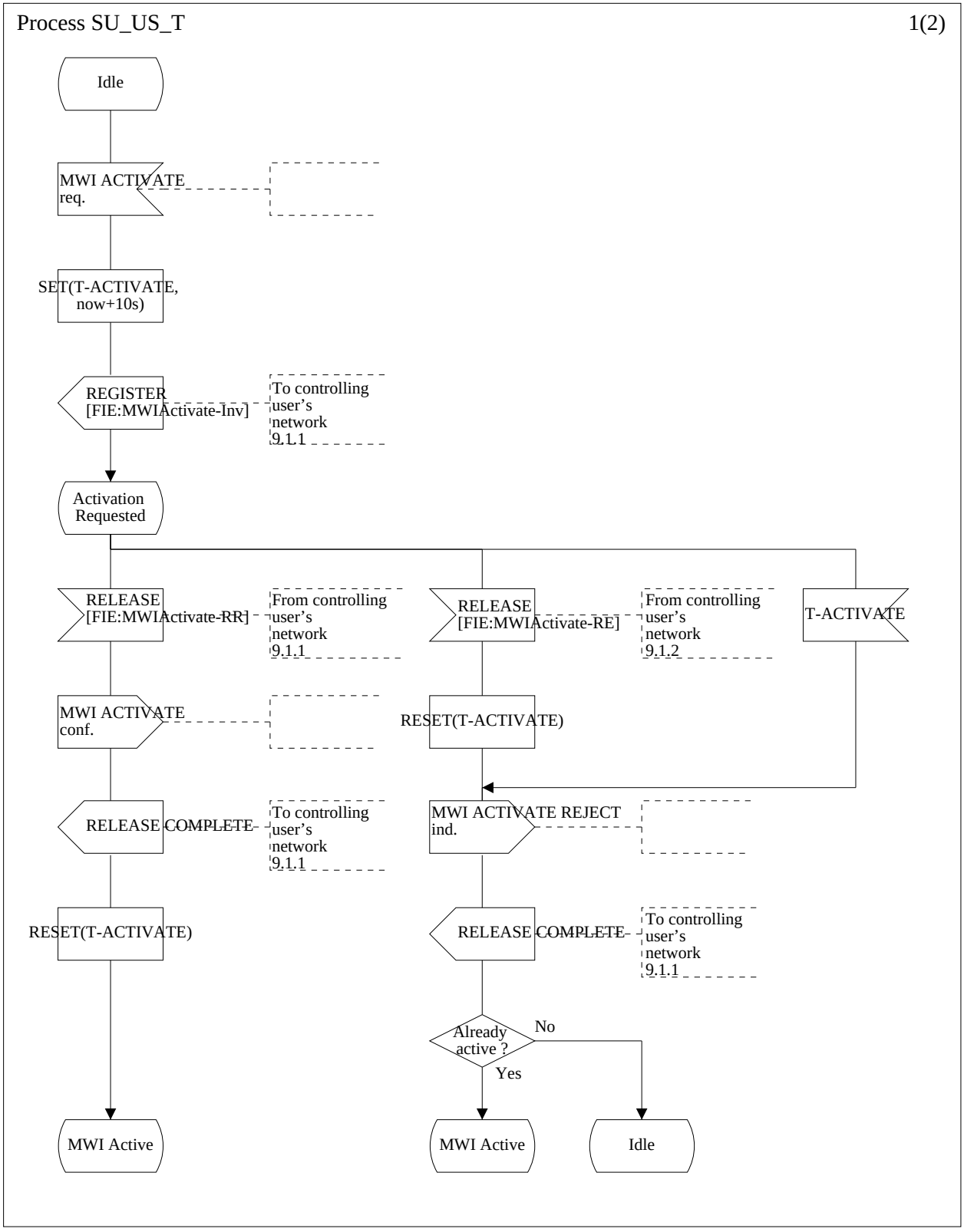


**Figure 2 (sheet 1 of 2): Process SU-US-T**

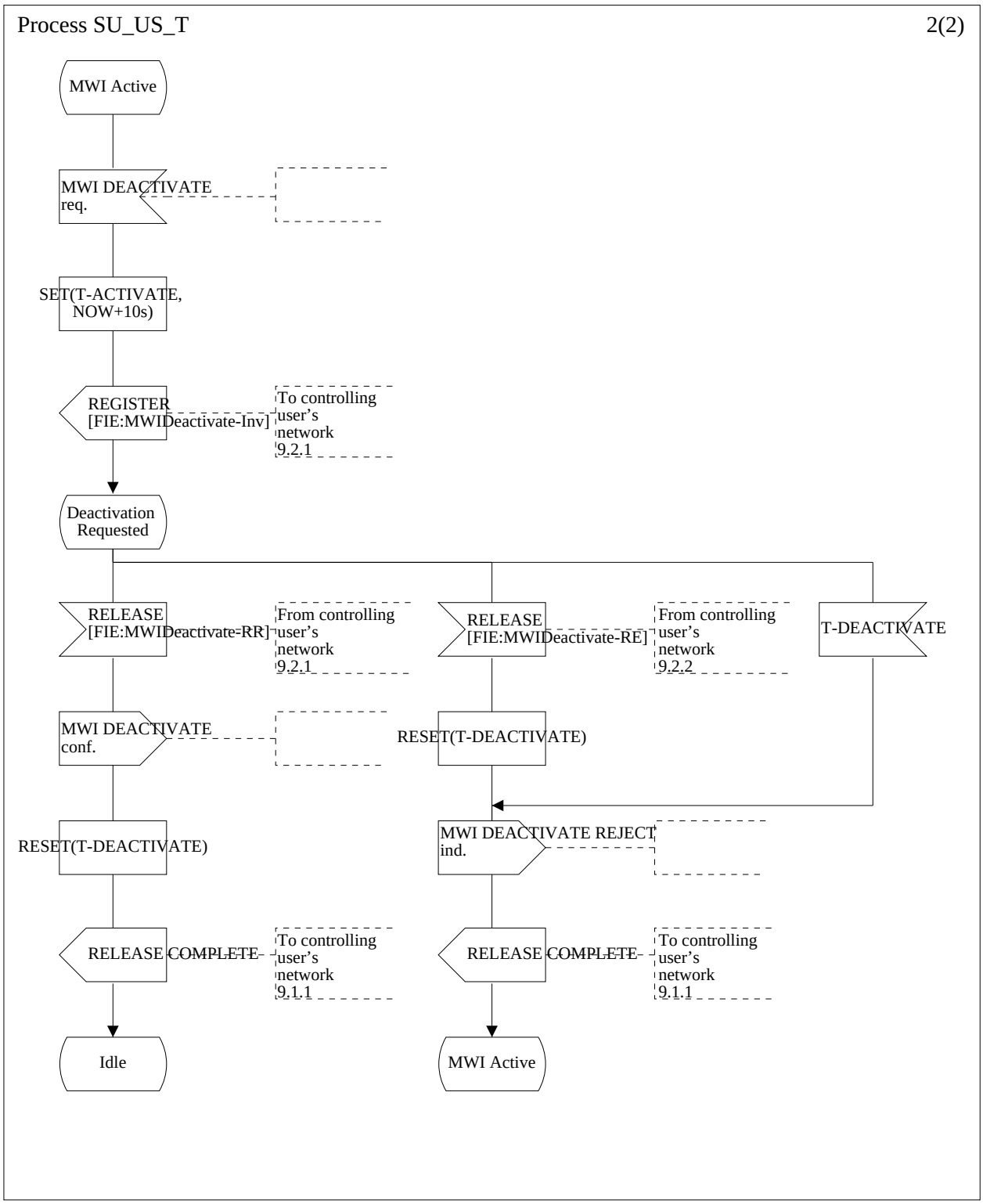


**Figure 2 (sheet 2 of 2): Process SU-US-T**

### 14.1.2 Controlling user - network side

#### 14.1.2.1 Controlling user - network side (coincident S and T reference point)

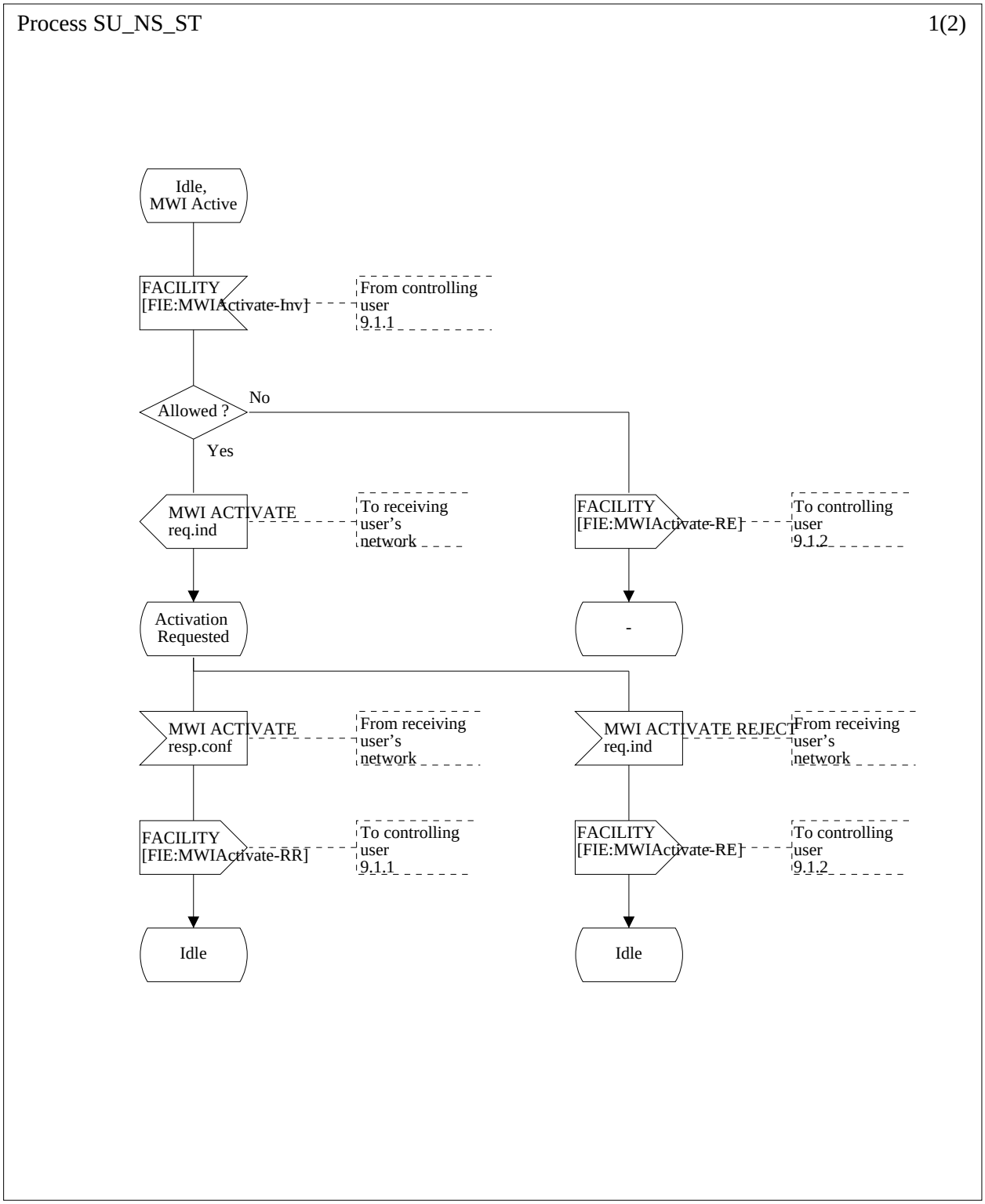


**Figure 3 (sheet 1 of 2): Process SU-NS-ST**

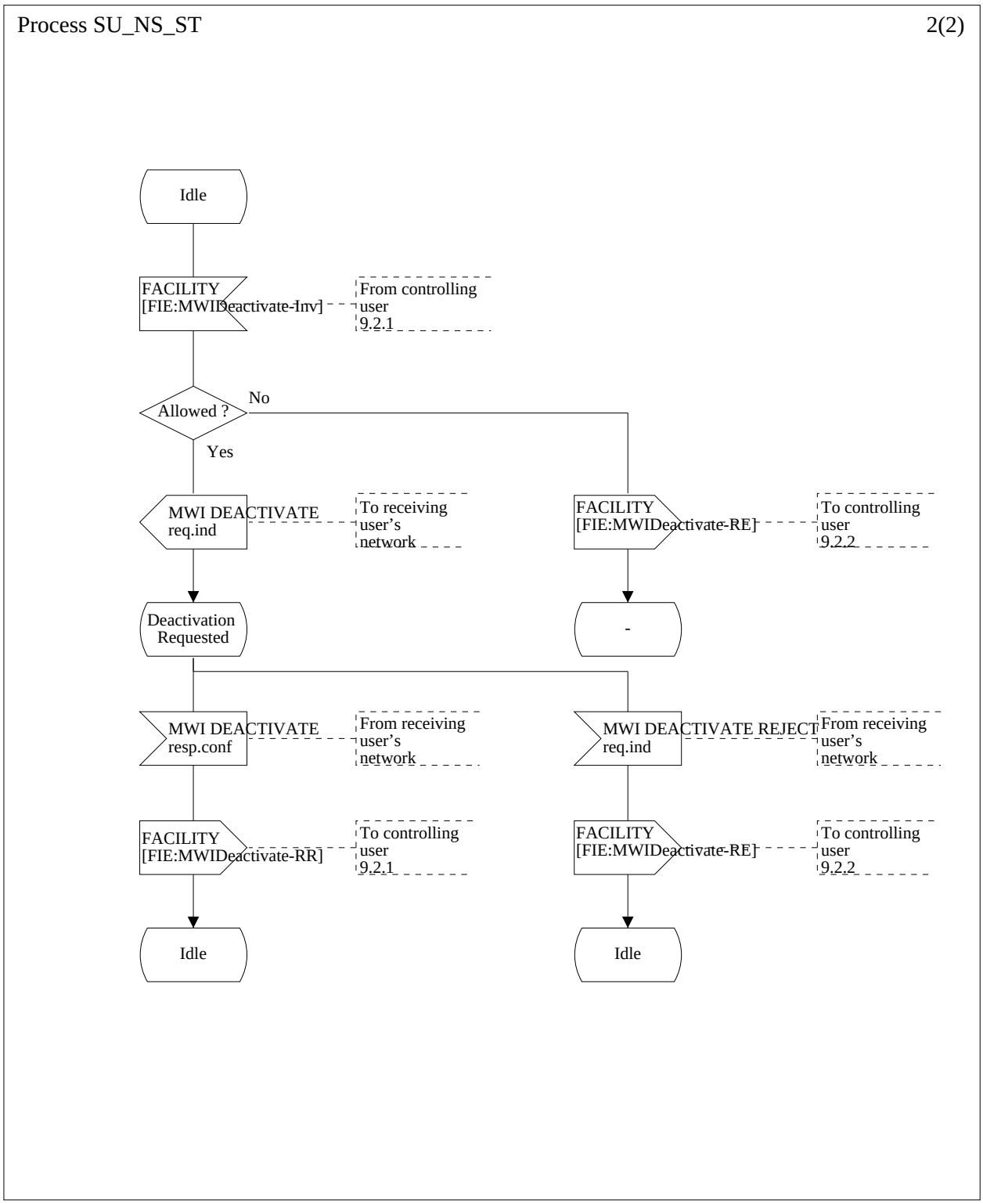


**Figure 3 (sheet 2 of 2): Process SU-NS-ST**

### 14.1.2.2 Controlling user - network side (T reference point)

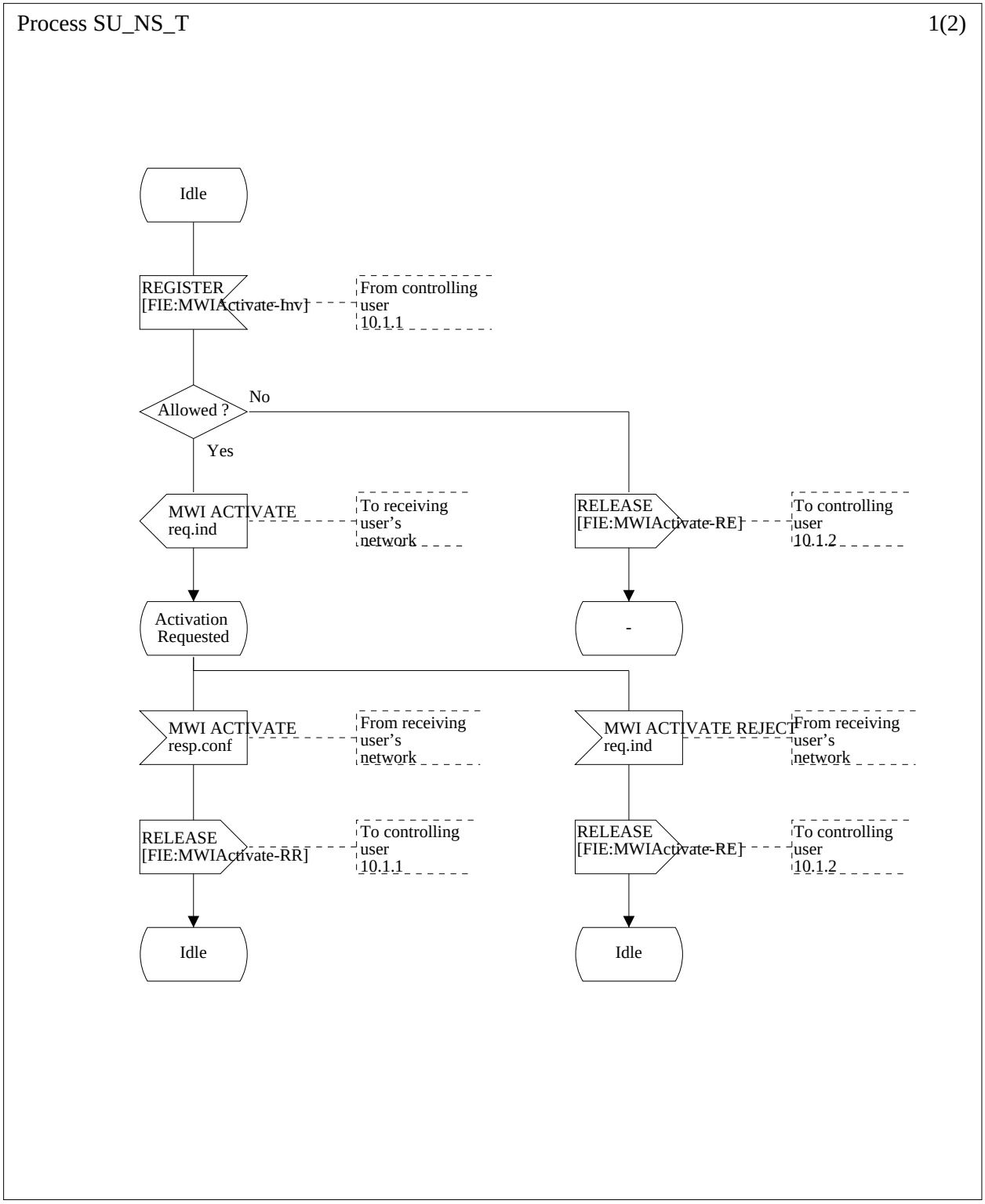


**Figure 4 (sheet 1 of 2): Process SU-NS-T**

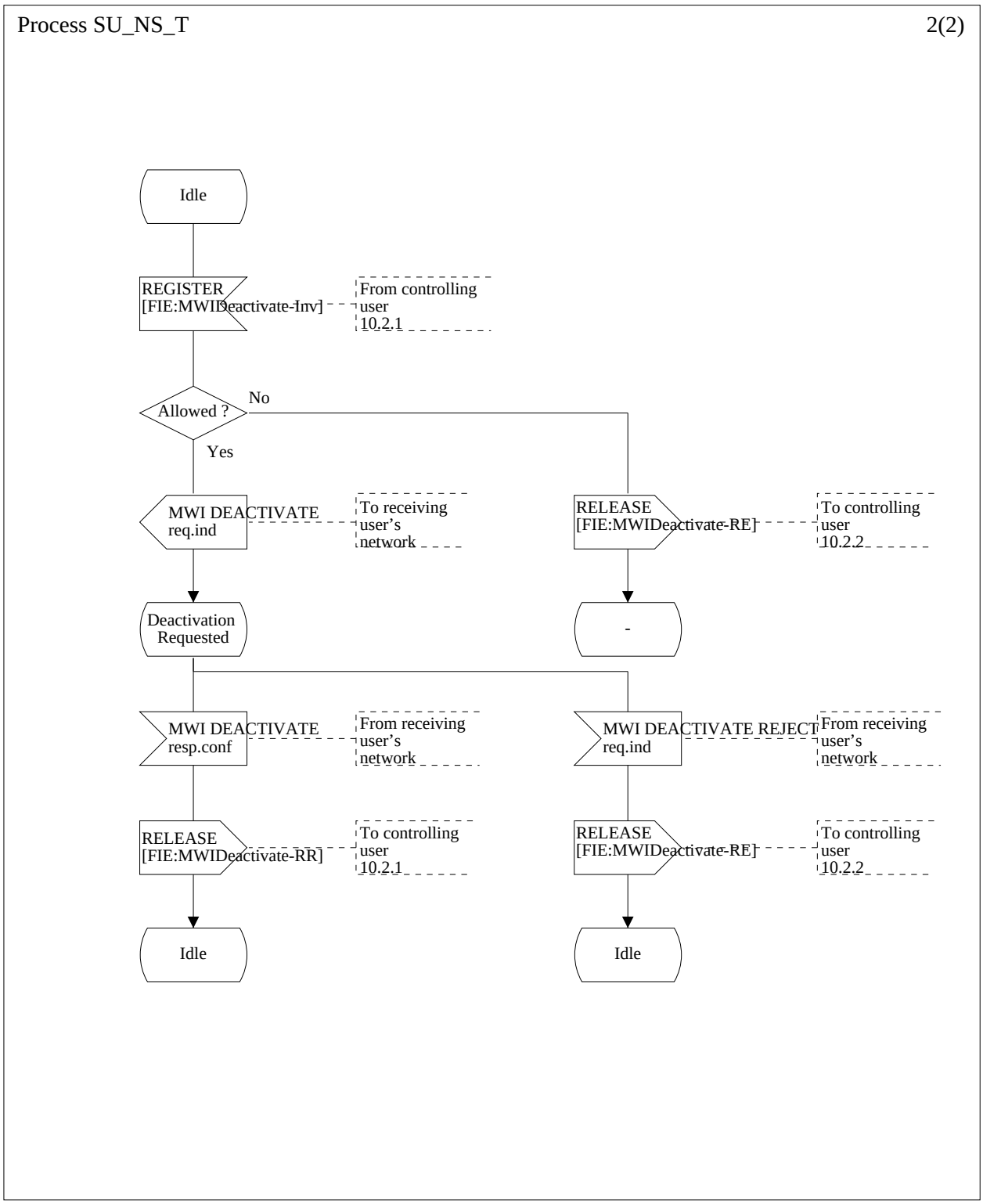


**Figure 4 (sheet 2 of 2): Process SU-NS-T**

## 14.2 Receiving user

### 14.2.1 Receiving user - user side

#### 14.2.1.1 Receiving user - user side (coincident S and T reference point)

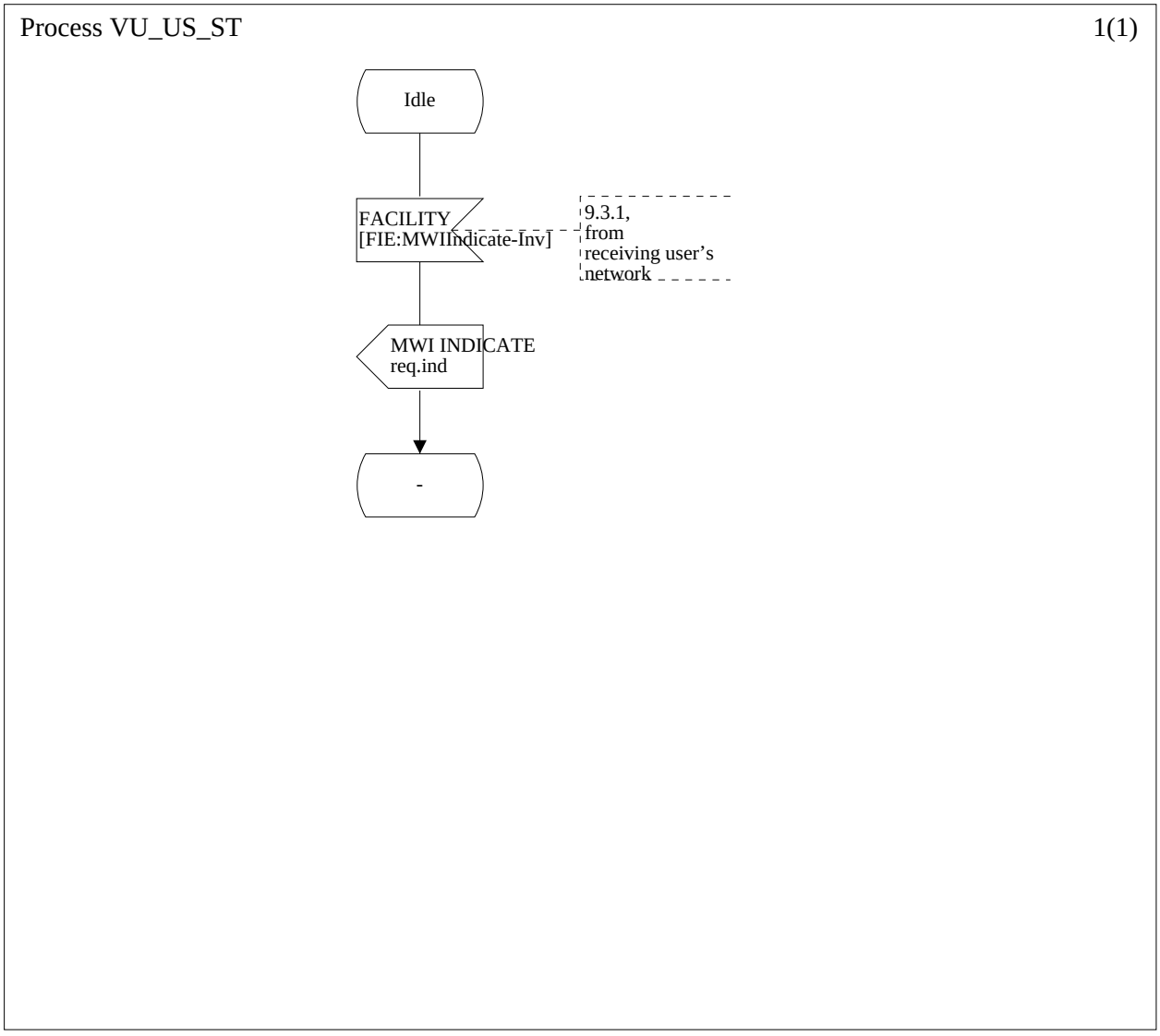


**Figure 5: Process VU-US-ST**

#### 14.2.1.2 Receiving user - user side (T reference point)

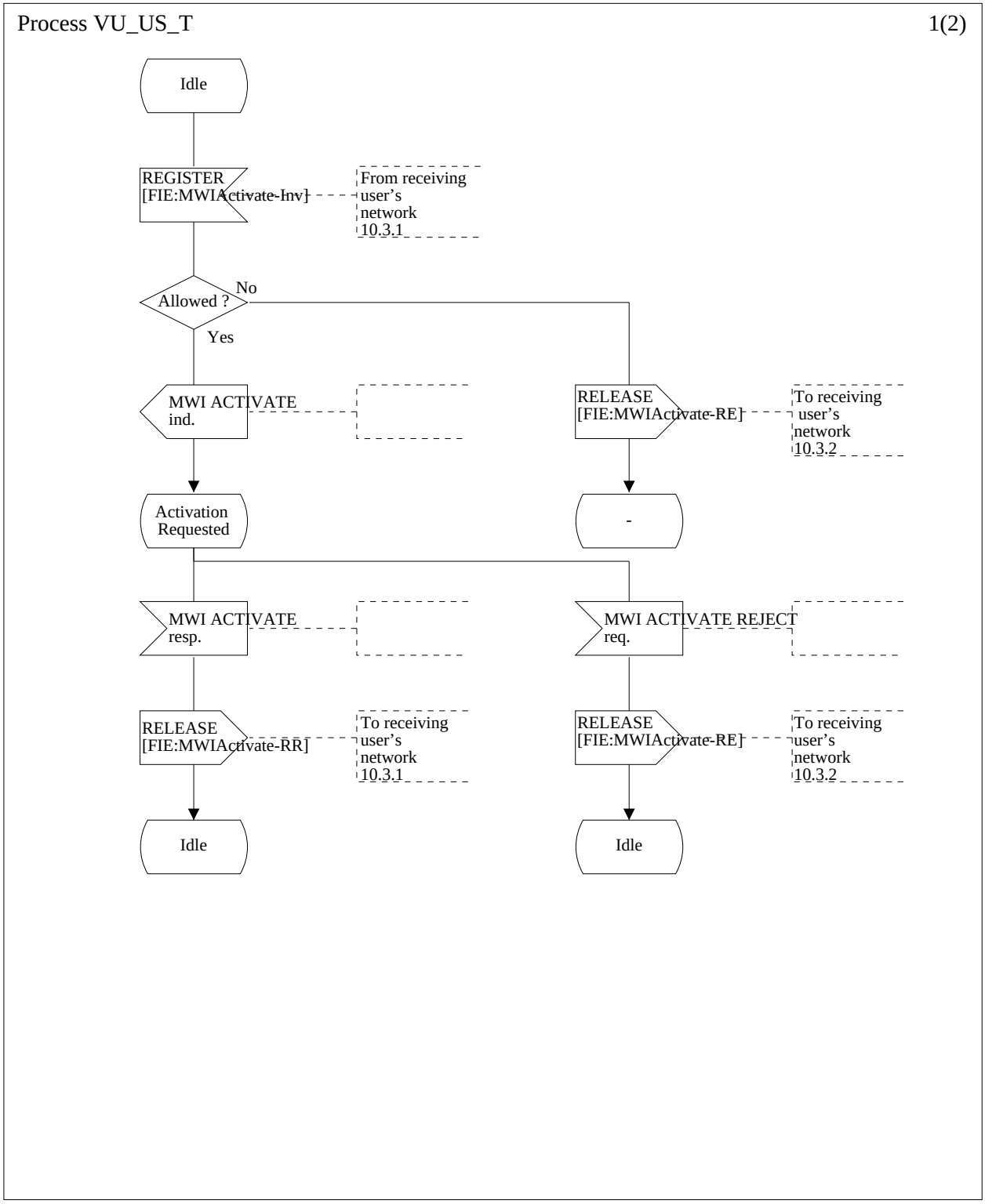


**Figure 6 (sheet 1 of 2): Process VU-US-T**

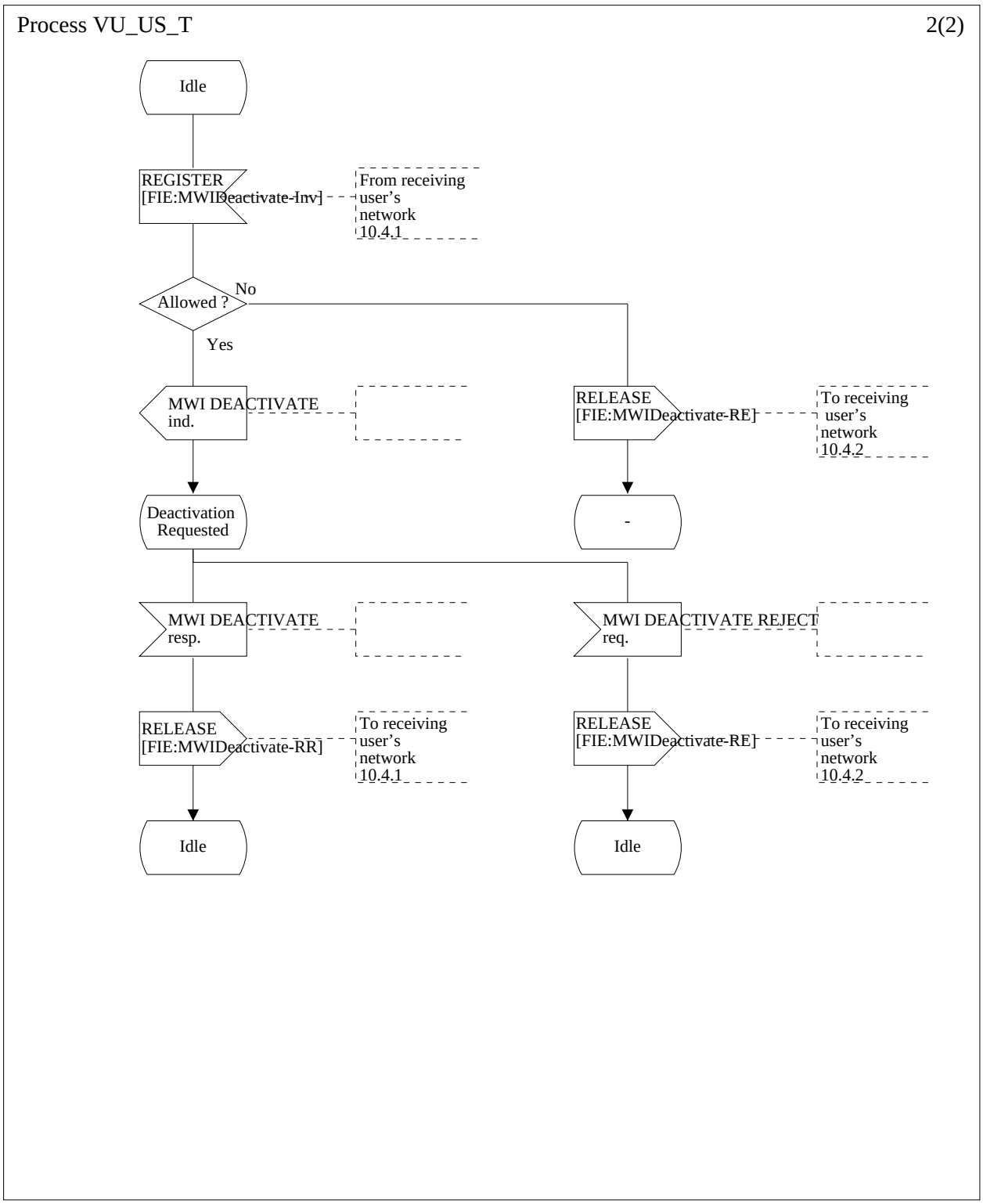


**Figure 6 (sheet 2 of 2): Process VU-US-T**

### 14.2.2 Receiving user - network side

#### 14.2.2.1 Receiving user - network side (coincident S and T reference point)

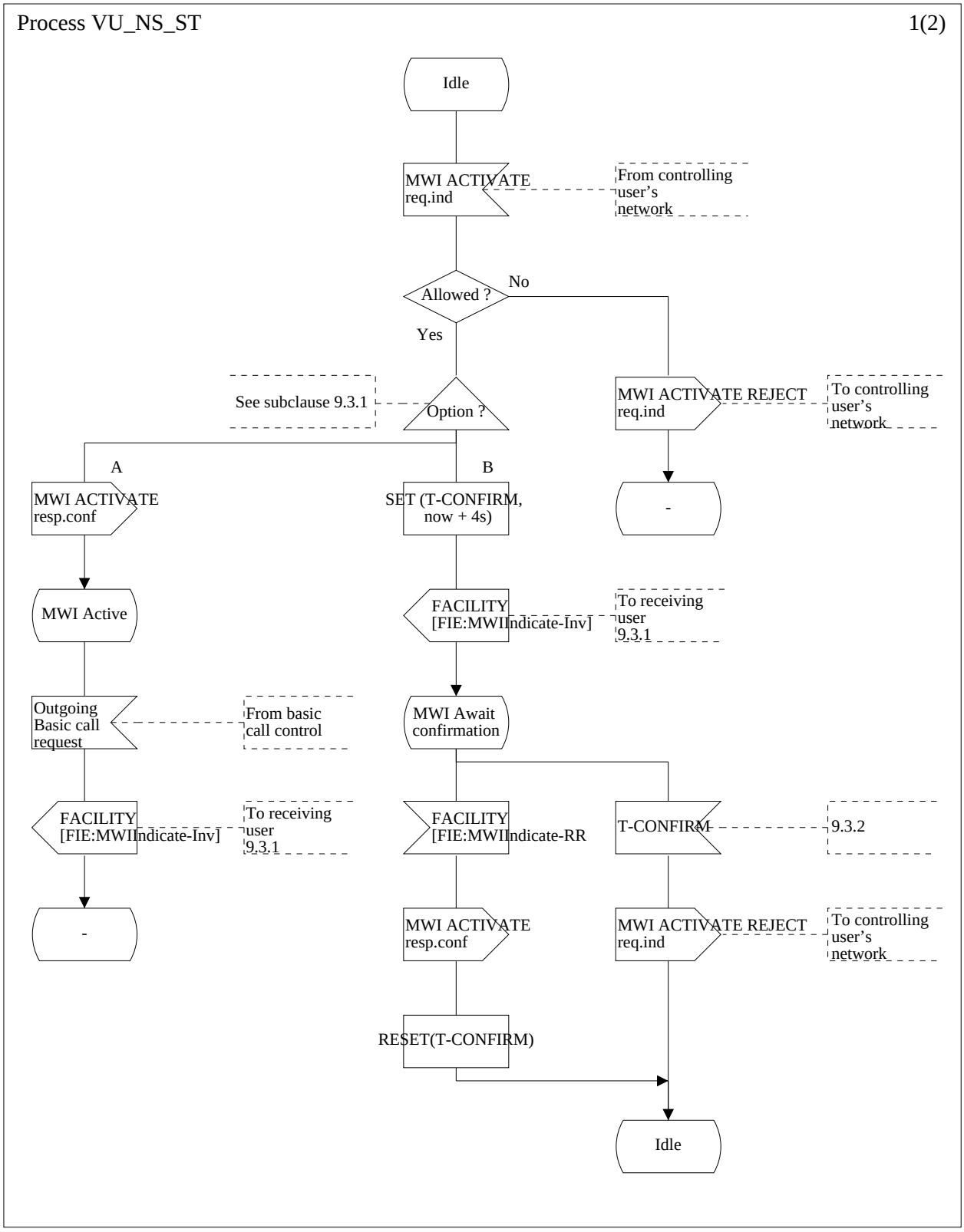


**Figure 7 (sheet 1 of 2): Process VU-NS-ST**

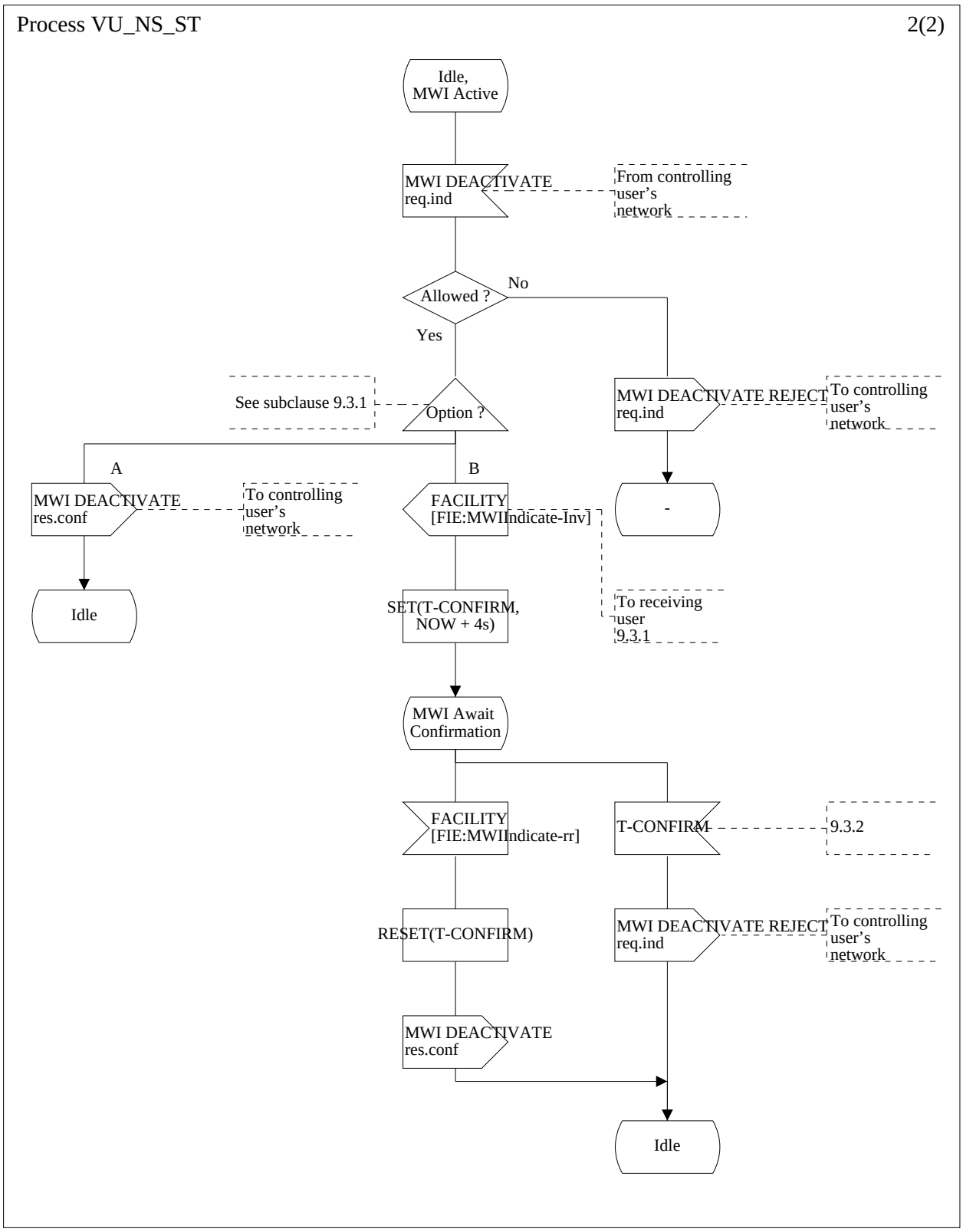


**Figure 7 (sheet 2 of 2): Process VU-NS-ST**

#### 14.2.2.2 Receiving user - network side (T-reference point)

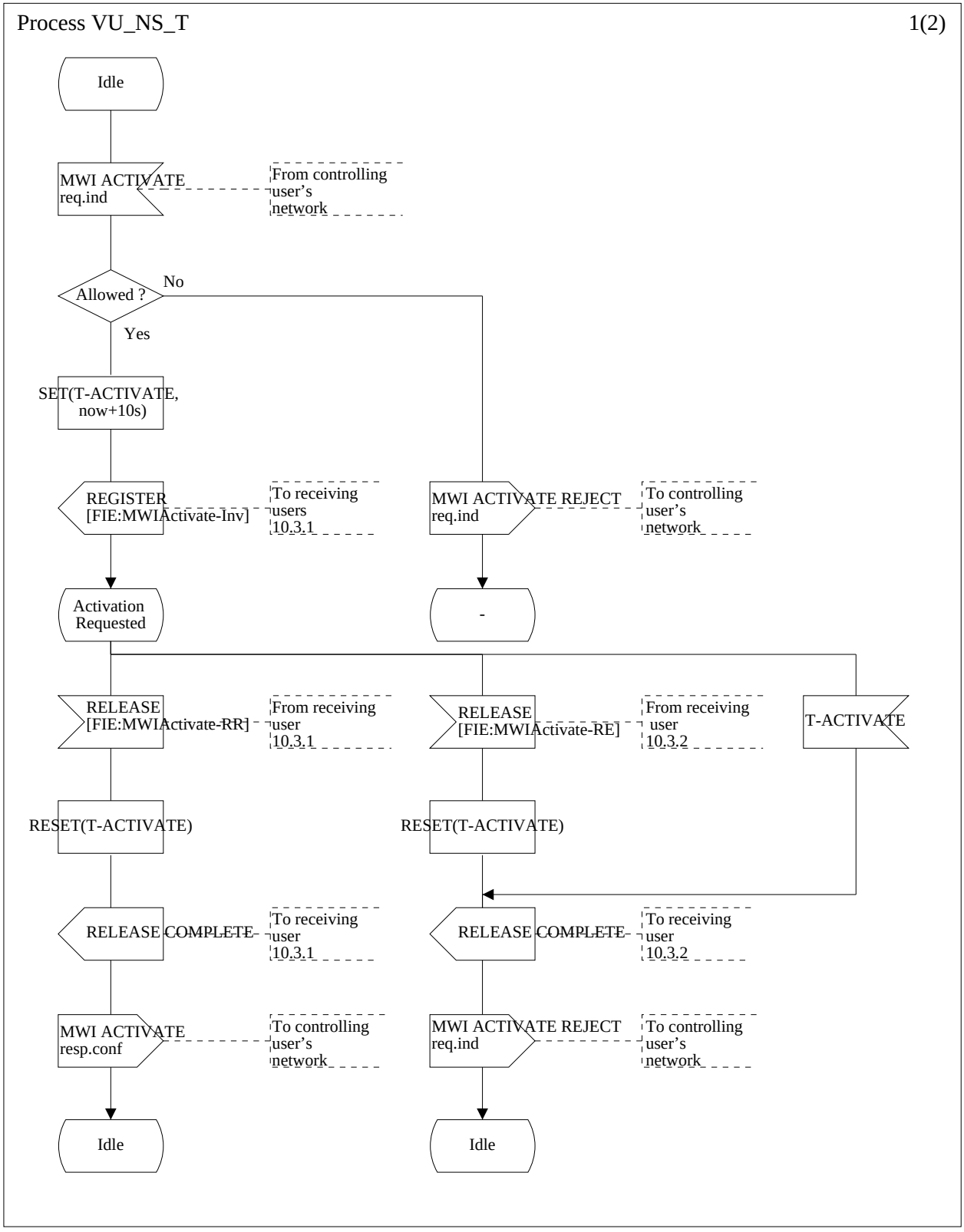


**Figure 8 (sheet 1 of 2): Process VU-NS-T**

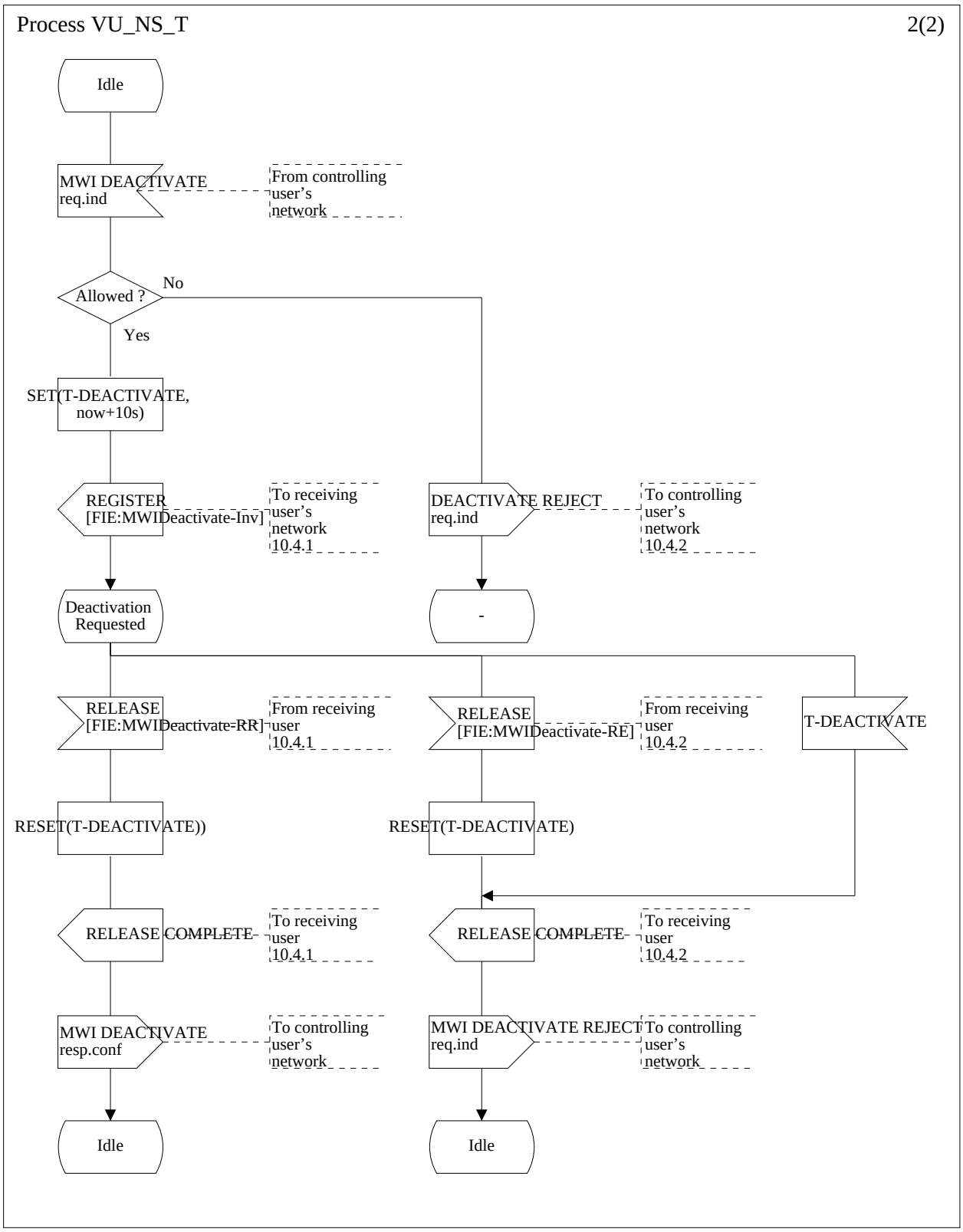


**Figure 8 (sheet 2 of 2): Process VU-NS-T**

## Annex A (informative): Signalling flows

Figures A.1 to A.4 show the signalling flows for the MWI supplementary service.

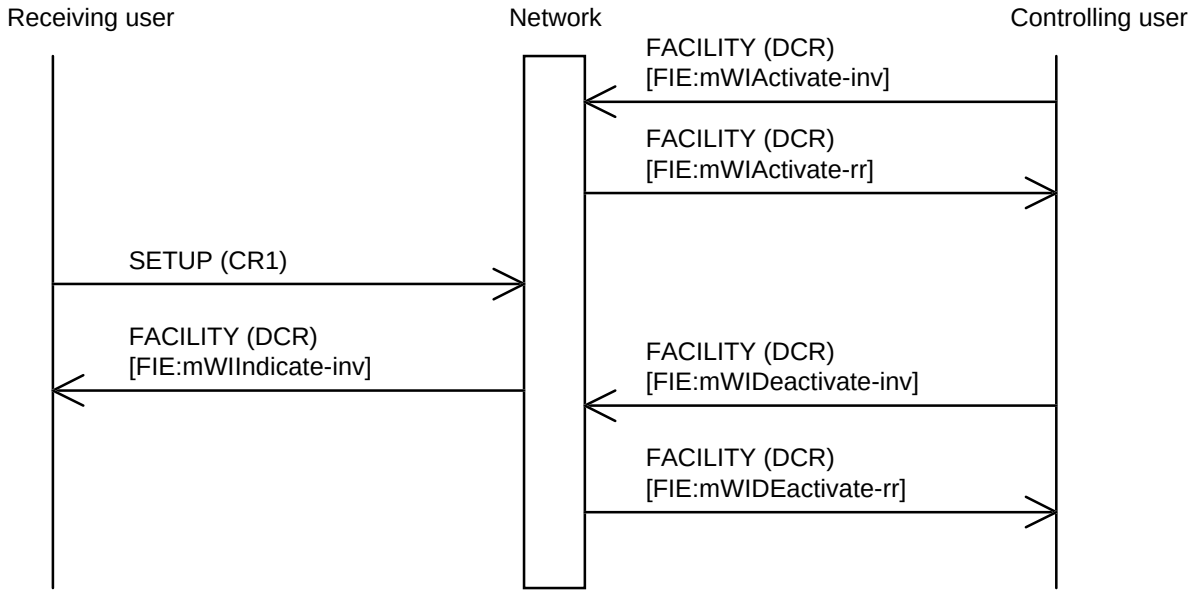


**Figure A.1: Activation and deactivation of the MWI supplementary service in case of user A in the same public network as user B (mode a)**

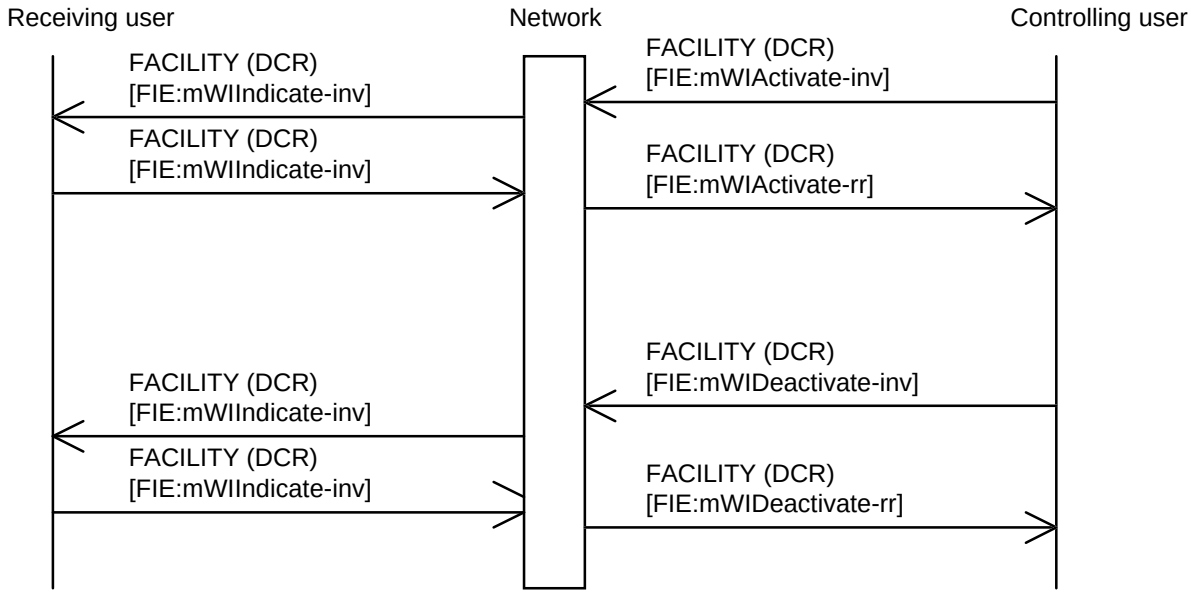


**Figure A.2: Activation and deactivation of the MWI supplementary service in case of user A in the same public network as user B (mode b)**

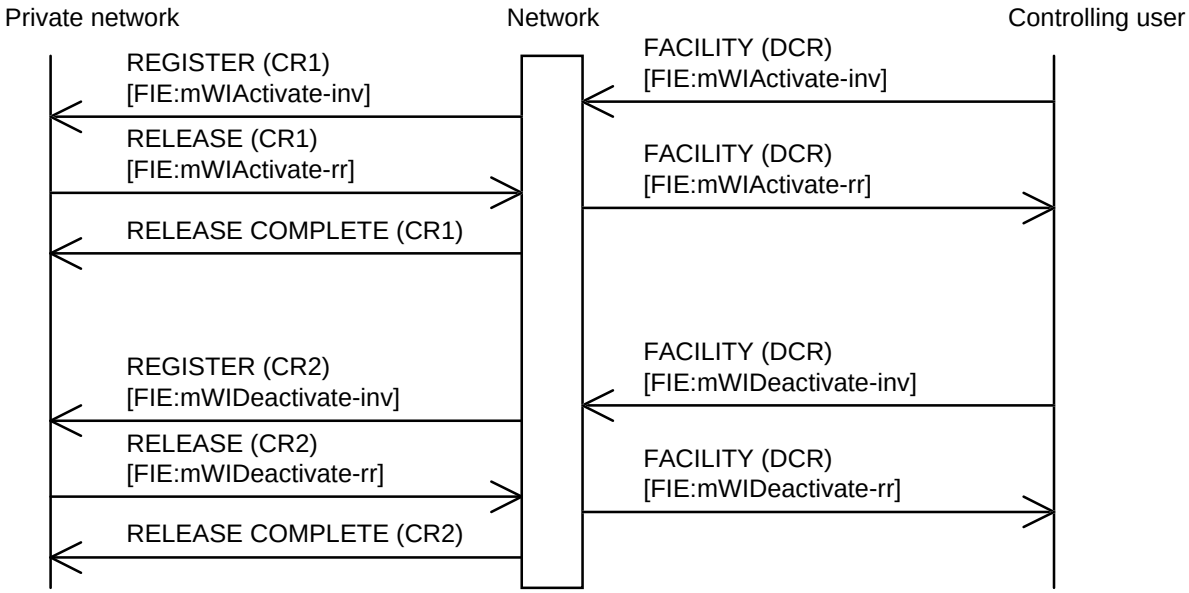


**Figure A.3: Activation and deactivation of the MWI supplementary service in case of user A in a private network**

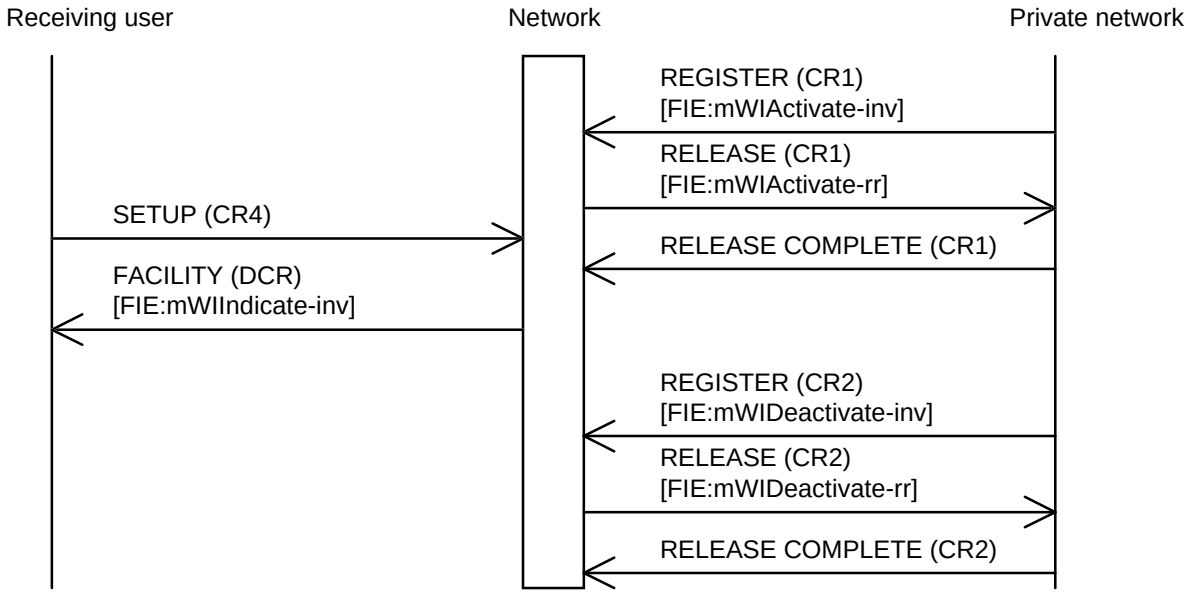


**Figure A.4: Activation and deactivation of the MWI supplementary service in case of user B in a private network and mode a) applies**

## Annex B (informative): Assignment of object identifier values

The following object identifier values are assigned in this ETS:

{ccitt identified-organization etsi(0) 745 operations-and-errors(1)}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 1}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 2}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 3}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 10}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 11}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 12}

{ccitt identified-organization etsi(0) 745 operations-and-errors(1) 13}

## History

| Document history | | | |
|---|---|---|---|
| May 1996 | Public Enquiry | PE 106: | 1996-05-20 to 1996-09-13 |
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