INTERNATIONAL TELECOMMUNICATION UNION

# ITU-T Q.2963.1

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TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols for access signalling

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# Peak cell rate modification by the connection owner

ITU-T Recommendation Q.2963.1
Superseded by a more recent version

(Previously CCITT Recommendation)

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*For further details, please refer to ITU-T List of Recommendations.*

**ITU-T RECOMMENDATION Q.2963.1**

# DIGITAL SUBSCRIBER SIGNALLING SYSTEM NO. 2 – CONNECTION MODIFICATION: PEAK CELL RATE MODIFICATION BY THE CONNECTION OWNER


## Summary

This Recommendation defines the operation of the Digital Subscriber Signalling System Number 2 (DSS 2) for the handling of the Connection characteristics modification feature that may be supported, as a network option, at the $T_B$ or at the coincident $S_B$ and $T_B$ reference point of the User to Network Interface of the Broadband Integrated Services Digital Network (B-ISDN). The Connection characteristics negotiation feature defined in this Recommendation enables the modification (increase or decrease of bandwidth) of the characteristics of an established point-to-point connection with regard to its traffic parameters (currently peak cell rates only) under the control of the user (currently the connection owner, who is the user who initiated the call/connection establishment).



## Source

ITU-T Recommendation Q.2963.1 was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 9th of July 1996.

## FOREWORD

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

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

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).

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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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**RECOMMENDATION Q.2963.1**

# DIGITAL SUBSCRIBER SIGNALLING SYSTEM NO. 2 – CONNECTION MODIFICATION: PEAK CELL RATE MODIFICATION BY THE CONNECTION OWNER

*(Geneva, 1996)*

## 1 Scope

This Recommendation specifies the signalling protocol for peak cell rate modification for the Broadband Integrated Services Digital Network (B-ISDN) at the $T_B$ reference point or coincident $S_B$ and $T_B$ reference point (as defined in Recommendation I.413 [1]) by means of the Digital Subscriber Signalling System No. 2 (DSS 2). It is the initial Recommendation in a family of Recommendations that concern the modification of ATM traffic parameters in B-ISDN connections.

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

The capability described in this Recommendation enables the connection owner to modify the peak cell rate for call/connections that have already been established.

Peak cell rate modification is applicable to all connection oriented telecommunication services that are based on single point-to-point calls/connections. The peak cell rate modification for point-to-multipoint calls/connections is outside the scope of this Recommendation.

This Recommendation is applicable to equipment, supporting peak cell rate modification, to be attached at either side of a $T_B$ reference point or coincident $S_B$ and $T_B$ reference point when used as an access to the public B-ISDN.

## 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.413 (1993), *B-ISDN user-network interface*.

[2] ITU-T Recommendation Q.2931 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling System No. 2 (DSS 2) – User-Network Interface (UNI) layer 3 specification for basic call/connection control*.

[3] ITU-T Recommendation Q.2961 (1995), *Broadband Integrated Services Digital Network (B-ISDN) – Digital Subscriber Signalling System No. 2 (DSS 2) – Additional traffic parameters*.

## 3 Definitions

For the purposes of this Recommendation the following definitions apply:

**3.1 addressed user**: The end user involved in the call that is the recipient of the connection modification request.

**3.2 connection modification**: The alteration of the characteristics of an established connection with regard to its traffic parameters under the control of the user (connection owner).

**3.3 connection owner**: One who initiates a connection is the connection owner. There is only one connection owner per connection.

**3.4 initiating user**: The end user involved in the call that requests the modification of the connection.

**3.5 terminating entity**: An end user that terminates the modification procedure.

**3.6 transit entity**: An entity that does not terminate the modification procedure.

**3.7 requesting entity**: An entity that requests modification. A requesting entity may be a terminating entity or a transit entity.

**3.8 responding entity**: An entity that receives a modifications request. A responding entity may be a terminating entity or a transitory entity.

## 4 Abbreviations

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

ATM Asynchronous Transfer Mode

B-ISDN Broadband Integrated Services Digital Network

PCR Peak Cell Rate

UNI User-Network Interface

VC Virtual Channel

## 5 Description

The basic capabilities supported by this Recommendation are applicable for:

1) In a given direction, all the specified traffic parameters must be requested to be modified either for increase or decrease. Increase of traffic parameters in one direction and decrease of traffic parameters in the other direction is possible within a single modification request.
2) Increasing the PCR.
3) Decreasing the PCR.
4) Modifying a point-to-point connection (Type 1).
5) Modifications may be initiated only by the connection owner for a call/connection that is already established (i.e. in the active state). Call/connections that are in the process of being established or cleared cannot be modified.

The following subclauses describe each capability in more detail.

### 5.1 Modifiable connections

Modification can only be requested by the connection owner for connections which are already established. Therefore, connections which are being established, modified, or cleared cannot be modified.

In the case where clearing is requested of a connection which is being modified, the clearing operation has priority. This results in termination of the modification procedure, i.e. no more messages related to the modification procedure are sent across the user-network interface.

### 5.2 Modification of a point-to-point connection

This Recommendation only supports the modification of the attributes of a point-to-point connection (Type 1).

### 5.3 Increasing or decreasing the Peak Cell Rate

In this Recommendation, only the increase or decease of the Peak Cell Rate (PCR) is specified. When increasing or decreasing PCR, the following rule applies:

- the modification initiating user is prepared to receive based on an ATM traffic descriptor for which the backward parameters are the greater of the existing backward traffic parameters and of the requested modified backward traffic parameters; and
- the modification initiating user transmits based on an ATM traffic descriptor for which the forward traffic parameters are the lesser of the existing forward traffic parameters and of the requested modified forward traffic parameters.

In a given direction, the PCR for CLP = 0 and the PCR for CLP = 0 + 1 (i.e. CLP 0 + 1 = CLP0 + CLP1) can be modified in the same modification request. In this case, the modified parameters in the given direction shall all be increased or all be decreased. In a given direction, a given parameter can only be modified if that parameter was specified for that direction during call establishment.

During the operation of modifying the ATM traffic parameters of a connection, the service application supported by the affected connection remains active.

NOTE – During the modification the connection remains usable for the application, with the above constraints.

When the OAM traffic descriptor information element is included at call/connection establishment, the allocation of bandwidth for OAM flows is based on the ATM traffic descriptor agreed. Since the OAM F5 flow allocation is bidirectional (see NOTE to subclause 4.5/Q.2931), the available user cell rate in one direction can be affected by modification of bandwidth in the other direction.

## 6 Operational requirements

The provision of the connection modification capability is a service provider option.

### 6.1 Provision and withdrawal

It is a user and a network option to provide the procedures described in this Recommendation. If implemented, the procedures of this Recommendation may be provided as a subscription option to the served user on the origination side.

### 6.2 Requirements on the originating network side

See 6.1 above.

### 6.3 Requirements on the destination network side

See 6.1 above.

## 7 Primitive and state definitions

### 7.1 Primitive definitions

Clause 8/Q.2931 shall apply. No additional primitives between DSS 2 layer 3 and the Signalling ATM Adaptation Layer are defined for the purpose of this Recommendation.

### 7.2 State definitions

The call/connection states listed in 2.1/Q.2931 [2] shall apply with the following additions:

**7.2.1 modify requested**: A MODIFY REQUEST message has been sent to the other side of the interface.

**7.2.2 modify received**: A MODIFY REQUEST message has been received from the other side of the interface.

## 8 Coding requirements

### 8.1 Messages

For the establishment/clearing of call/connections, the messages described in Recommendation Q.2931 as modified by Recommendation Q.2961.1 remain valid, and do not have to be enhanced. In order to support the modification of the connections the following messages should be supported:

MODIFY REQUEST

MODIFY ACKNOWLEDGE

MODIFY REJECT

CONNECTION AVAILABLE

### 8.1.1 MODIFY REQUEST

This message is sent from the user to the network and from the network to the user to request modification of a single connection. See Table 8-1.

TABLE 8-1/Q.2963

**MODIFY REQUEST message content**

| Message type: MODIFY REQUEST<br>Significance: Global<br>Direction: Both | | | | |
|---|---|---|---|---|
| Information element | Reference | Direction | Type | Length |
| Protocol discriminator | 4.2/Q.2931 | Both | M | 1 |
| Call reference | 4.3/Q.2931 | Both | M | 4 |
| Message type | 4.4/Q.2931 | Both | M | 2 |
| Message length | 4.4/Q.2931 | Both | M | 2 |
| ATM traffic descriptor | 4.5/Q.2931 | Both | M | 8 - 20 (Note 2) |
| Notification indicator | 4.5/Q.2931 | Both | O (Note 1) | 4 -* |
| NOTES<br>1 See Note 11 in Table 3-8/Q.2931.<br>2 All four peak cell rate parameters are optional but at least one shall be present. | | | | |

### 8.1.2 MODIFY ACKNOWLEDGE

This message is sent by the network or the user to indicate that the modify request is accepted. See Table 8-2.

TABLE 8-2/Q.2963.1

**MODIFY ACKNOWLEDGE message content**

| Message type: MODIFY ACKNOWLEDGE<br>Significance: Global<br>Direction: Both | | | | |
|---|---|---|---|---|
| Information element | Reference | Direction | Type | Length |
| Protocol discriminator | 4.2/Q.2931 | Both | M | 1 |
| Call reference | 4.3/Q.2931 | Both | M | 4 |
| Message type | 4.4/Q.2931 | Both | M | 2 |
| Message length | 4.4/Q.2931 | Both | M | 2 |
| Notification indicator | 4.5/Q.2931 | Both | O (Note 1) | 4 -* |
| Broadband report type | 8.2.2/Q.2963 | Both | O (Note 2) | 4 - 5 |
| NOTES<br>1 See Note 11 in Table 3-8/Q.2931.<br>2 Included when the addressed user requires confirmation of the success of modification in the addressed user to calling user direction. | | | | |

### 8.1.3 MODIFY REJECT

This message is sent by the network to the user to indicate that the modify connection request is rejected. See Table 8-3.

TABLE 8-3/Q.2963.1

**MODIFY REJECT message content**

| Message type: MODIFY REJECT<br>Significance: Global<br>Direction: Both | | | | |
|---|---|---|---|---|
| Information element | Reference | Direction | Type | Length |
| Protocol discriminator | 4.2/Q.2931 | Both | M | 1 |
| Call reference | 4.3/Q.2931 | Both | M | 4 |
| Message type | 4.4/Q.2931 | Both | M | 2 |
| Message length | 4.4/Q.2931 | Both | M | 2 |
| Notification indicator | 4.5/Q.2931 | Both | O (Note) | 4 -* |
| Cause | 4.5/Q.2931 | Both | M | 6 - 34 |
| NOTE – See Note 11 in Table 3-8/Q.2931. | | | | |

### 8.1.4 CONNECTION AVAILABLE

This message is sent from the user to the network at the originating interface and network to the user at the destination interface in response to the MODIFY ACKNOWLEDGE message that contains a broadband report type information element with a type of report field coded to "Modification confirmation". It indicates the network has performed modification in the addressed user to calling user direction of transmission. See Table 8-4.

NOTE – This message should be used only for the purpose of confirmation to the addressed user.

TABLE 8-4/Q.2963.1

**CONNECTION AVAILABLE message content**

| Message type: CONNECTION AVAILABLE<br>Significance: Global<br>Direction: Both | | | | |
|---|---|---|---|---|
| Information element | Reference | Direction | Type | Length |
| Protocol discriminator | 4.2/Q.2931 | Both | M | 1 |
| Call reference | 4.3/Q.2931 | Both | M | 4 |
| Message type | 4.4/Q.2931 | Both | M | 2 |
| Message length | 4.4/Q.2931 | Both | M | 2 |
| Notification indicator | 4.5/Q.2931 | Both | O (Note) | 4 -* |
| NOTE – See Note 11 in Table 3-8/Q.2931. | | | | |

## 8.2 Coding of specific message types and specific information elements

### 8.2.1 Coding of specific message types

TABLE 8-5/Q.2963.1

**Specific connection modification message types**

| Message type (octet 1) | |
|---|---|
| Bits | |
| 87654321 | |
| 10001000 | MODIFY REQUEST |
| 10001001 | MODIFY ACKNOWLEDGE |
| 10001010 | MODIFY REJECT |
| 10001011 | CONNECTION AVAILABLE |

Table 8-5 shows message type (octet 1) code points for the messages defined in 8.1. These are in addition to the values shown in Table 4-4/Q.2931.

### 8.2.2 Coding of specific information elements

For the establishment/clearing of call/connections, the information elements described in Recommendation Q.2931 and Q.2961 remain valid, and do not have to be enhanced. In order to support the modification of the connections the following information element has to be supported.

**Broadband report type**

The purpose of the broadband report type information element is to indicate the type of report requested when included in an appropriate DSS 2 message (e.g. MODIFY ACKNOWLEDGE) when such a report is deemed necessary.

The broadband report type information element is coded as shown in Figure 1 and Table 8-6.

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Octets |
|---|---|---|---|---|---|---|---|---|
| | Broadband report type | | | | | | | |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| | Information element identifier | | | | | | | |
| 1 | Coding standard | | Information element instruction field | | | | | 2 |
| ext | | | Flag | Res. | Information element action indicator | | | |
| Length of type of report contents | | | | | | | | 3 |
| | | | | | | | | 4 |
| Type of report | | | | | | | | 5 |

FIGURE 1/Q.2963.1

**Broadband report type information element**

TABLE 8-6/Q.2963.1

– Type of report (octet 5)

| Bits | |
|---|---|
| 87654321 | |
| 00000000 | reserved |
| 00000001 | Modification confirmation (Note 1) |
| 00000010 | |
| to | reserved |
| 11111111 | |

NOTE – Indicates the addressed user in connection modification requires confirmation of success of the modification.

## 9 Signalling procedures at the coincident $S_B$ and $T_B$ reference point

The procedures for modification of connection characteristics are specified between modification requesting and responding entities. A requesting entity or a responding entity may be a terminating entity (i.e. end user at the coincident $S_B$ and $T_B$ reference point) or a transit (i.e. network) entity.

These procedures are additional to those specified in Recommendation Q.2931.

An illustration of the resource reservation and allocation procedures is given in Appendix I.

### 9.1 Modification procedures at the requesting entity

#### 9.1.1 Modification request

To request modification of a call/connection in the active state the entity shall:

– if a terminating entity:
  - reserve corresponding resources if increase of ATM traffic parameters is requested;
  - reduce the transmitting ATM traffic parameters when decrease is requested;

– if a transit entity:
  - reserve corresponding resources if increase of ATM traffic parameters is requested;

– send a MODIFY REQUEST message with the call reference of the active call/connection including an ATM traffic descriptor information element describing the requested connection characteristics;

– start Timer T360; and

– enter the modify requested state (U/N 13).

#### 9.1.2 Modification acknowledgement

On reception of a MODIFY ACKNOWLEDGE message in the modify requested state, the requesting entity shall:

– if a terminating entity:
  - allocate corresponding resources (i.e. the connection defined by the requested ATM traffic descriptor is available for use);
  - send a CONNECTION AVAILABLE message if the MODIFY ACKNOWLEDGE message contains a broadband report type information element indicating that confirmation of modification is required;

– if a transit entity:

- allocate corresponding resources;
- change UPC according to the ATM traffic parameters;
- forward the modify acknowledgement towards the initiating user;

– stop Timer T360; and

– enter the active state.

### 9.1.3 Indication of modification rejection

An entity receiving a MODIFY REJECT message while in the modify requested state shall:

– if a terminating entity:

- cancel the reservation of resources (i.e. the ATM traffic parameters are as applied prior to the modification request);

– if a transit entity:

- cancel the reservation of resources and reinstate the policing policy that applied prior to the modification request;
- forward the modification rejection to the initiating user;

– stop Timer T360; and

– enter the active state.

### 9.1.4 Response to STATUS messages while in the modify request state

On reception of a STATUS message while in the modify requested state, the requesting entity shall:

– if the STATUS message indicates that the responding entity is in the active state and includes a cause value No. 97 "message type non-existent or not implemented" or No. 101 "message not compatible with call state" with a diagnostic indicating that the MODIFY REQUEST message was not understood;

  – if a terminating entity:

    - cancel the reservation of resources (i.e. the ATM traffic parameters are as applied prior to the modification request);

  – if a transit entity:

    - cancel the reservation of resources and reinstate the policing policy that applied prior to the modification request;
    - forward the modification rejection to the initiating user;

  – stop Timer T360;

  – enter the active state;

– if the STATUS message includes a cause value No. 97 or No. 101 without a diagnostic indicating that the MODIFY REQUEST message was not understood: send a STATUS ENQUIRY message to the responding entity;

– if a STATUS message is received in response to this STATUS ENQUIRY indicating the modify received state, the entity shall remain in the modify requested state;

– if a STATUS message is received in response to this STATUS ENQUIRY indicating that the responding entity is in the active state the entity shall:

  – if a terminating entity:

    - cancel the reservation of resources (i.e. the ATM traffic parameters are as applied prior to the modification request);

– if a transit entity:
  - cancel the reservation of resources and reinstate the policing policy that applied prior to the modification request;
  - forward the modification rejection to the initiating user;
– stop Timer T360; and
– enter the active state.

### 9.1.5 No response to modification request

On expiry of Timer T360 the call/connection shall be cleared with cause No. 102 "recover on timer expiry".

## 9.2 Modification procedures at the responding entity

### 9.2.1 Modification indication

On receiving a MODIFY REQUEST message in the active state, the responding entity shall:

– if the responding entity is a transit entity and is able to support the modification request:
  - reserve corresponding resources if increase of ATM traffic parameters is requested;
  - change the forward UPC if decrease of forward ATM traffic parameters is requested;
  - progress the modification towards the remote user; and
  - enter the modified received (U/N 14) state.

### 9.2.2 Modification acceptance

If the responding entity is a transit entity, on receiving an indication that the modification has been accepted while the modify received state, it shall:

- allocate corresponding resources;
- change forward UPC if increase of forward ATM traffic parameters is requested;
- send a MODIFY ACKNOWLEDGE message; and
- enter the active state.

On reception of a MODIFY REQUEST message in the active state a responding terminating entity shall, if the request for modification is to be accepted:

– if confirmation of modification is not required:
  - change the ATM traffic parameters as requested;
  - send a MODIFY ACKNOWLEDGE message; and
  - enter the active state.
– if confirmation of modification is required:
  - reduce the backward ATM traffic parameters when decrease is requested;
  - change the forward (i.e. receiving) ATM traffic parameters as requested;
  - send a MODIFY ACKNOWLEDGE message including a broadband report type information element requesting confirmation;
  - start Timer T361; and
  - enter the active state.

### 9.2.3 Modification confirmation

If a CONNECTION AVAILABLE message is received by a terminating entity while Timer T361 is running, the entity shall:

– change ATM traffic parameters as requested (i.e. increase backward ATM traffic parameters);

– stop Timer T361; and

– remain in the active state.

If Timer T361 expires the entity shall:

– change ATM traffic parameters as requested (i.e. increase backward ATM traffic parameters); and

– remain in the active state.

### 9.2.4 Modification rejection

If the responding entity is a transit entity, on receiving an indication that the modification has been rejected, it shall:

– cancel the reservation of resources and reinstate the policing policy that applied prior to the modification request;

– send a MODIFY REJECT message including the cause information element generated by the addressed entity; and

– enter the active state.

If the responding entity is a terminating entity, and the request of modification is to be rejected, it shall:

– send a MODIFY REJECT message including a cause information element with an appropriate cause value; and

– enter the active state.

## 9.3 Transit entity conveyance of CONNECTION AVAILABLE messages

While in the active state, after the completion of modification request, a transit entity shall transfer a CONNECTION AVAILABLE message transparently, and remain in the active state.

# 10 Procedures at the $T_B$ reference point for interworking with private B-ISDNs

The procedures of clause 9 shall apply at the $T_B$ reference point.

# 11 Interworking with other networks

No interworking with other networks has been identified.

# 12 Interworking with supplementary services

No requirements for interworking with supplementary services have been identified.

## 13 Parameter values

The description of timers in the following tables provides the default values of the timers and a brief summary of their use. The precise detail is specified in clauses 9 and 10.

### 13.1 Timers at the requesting entity

The timers specified in Table 13-1 are used at the requesting entity.

TABLE 13-1/Q.2963.1

**Timers in the requesting entity defined in clauses 9 and 10**

| Timer number | Default time out value | Requesting entity state | Cause for start | Normal stop | At the first expiry | At the second expiry | Implemen-tation |
|---|---|---|---|---|---|---|---|
| T360 | 20 - 30 s (Note) | Modify requested | MODIFY REQUESTsent | MODIFY ACKNOW-LEDGE or MODIFY REJECT received | Release call | Timer is not restarted | Mandatory |

NOTE – It is recommended that a terminating entity use a value of 30 s and that a transit entity use a value of 20 s.

### 13.2 Timers at the responding entity

TABLE 13-2/Q.2963.1

**Timers in the responding entity defined in clauses 9 and 10**

| Timer number | Default time out value | Responding entity state | Cause for start | Normal stop | At the first expiry | At the second expiry | Implemen-tation |
|---|---|---|---|---|---|---|---|
| T361 | 20 s | Active | MODIFY ACKNOW-LEDGE sent with broadband report type indicating confirmation is required | CONNECTION AVAILABLE received | Commence sending in the user plane at the modified rate | Timer is not restarted | Mandatory if modification confirmation is requested (Note) |

NOTE – Only applicable at a terminating entity.

The timers specified in Table 13-2/Q.2963 are used at the responding entity.

## 14 Dynamic description SDLs

Detailed Specification and Description Language (SDL) diagrams for the procedures specified in clauses 9 and 10 are contained in this clause. When there is an ambiguity in the narrative text, the

SDL diagrams should be used to resolve the conflict. Where the text and the SDL are in disagreement, the text should be used as the prime source.

The terminology and acronyms of Annex A/Q.2931 shall apply in the SDLs in this clause. These SDLs extend the SDLs defined in Annex A/Q.2931 and should be read in conjunction with the SDLs in Annex A/Q.2931.

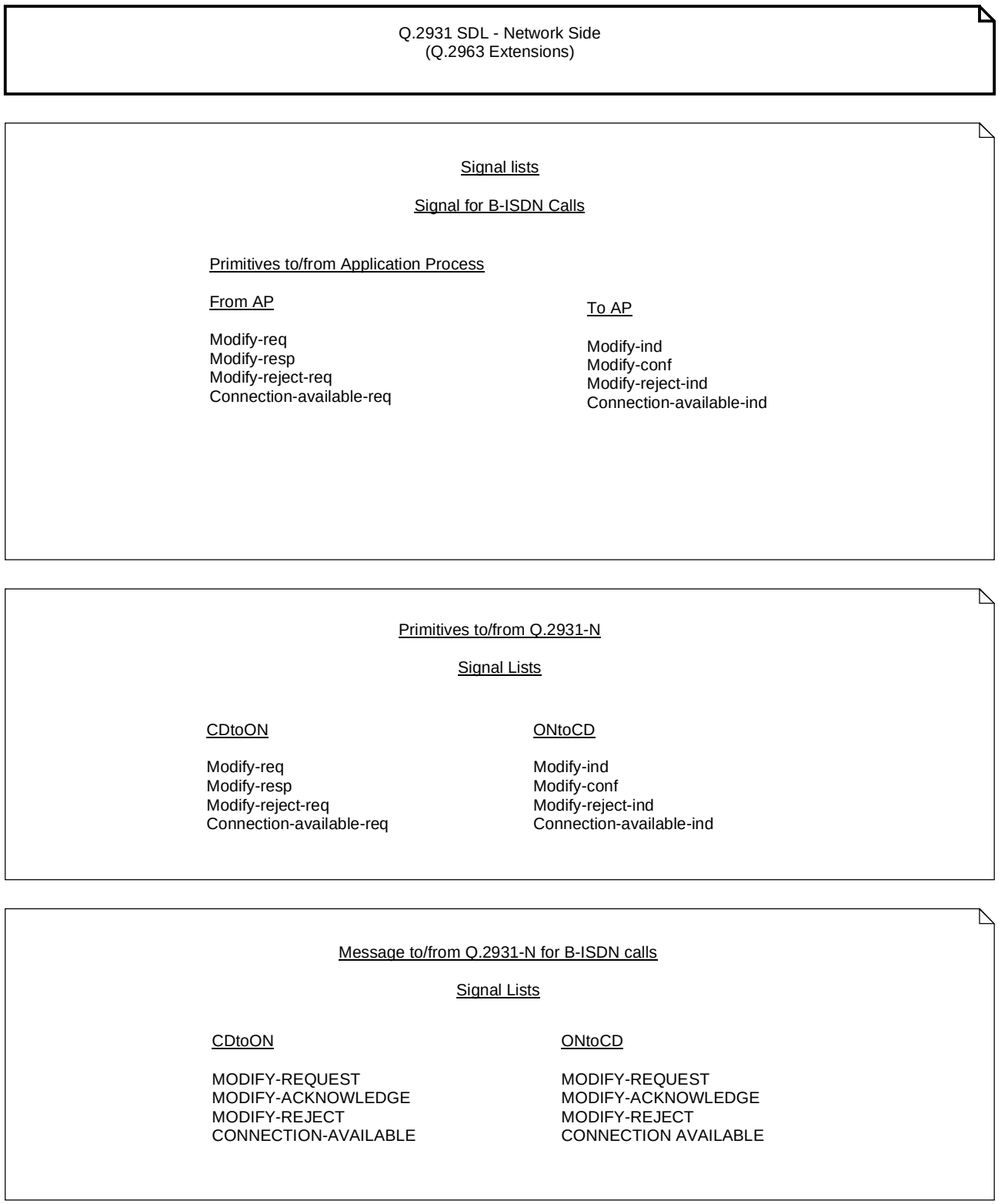


FIGURE 14-1/Q.2963.1

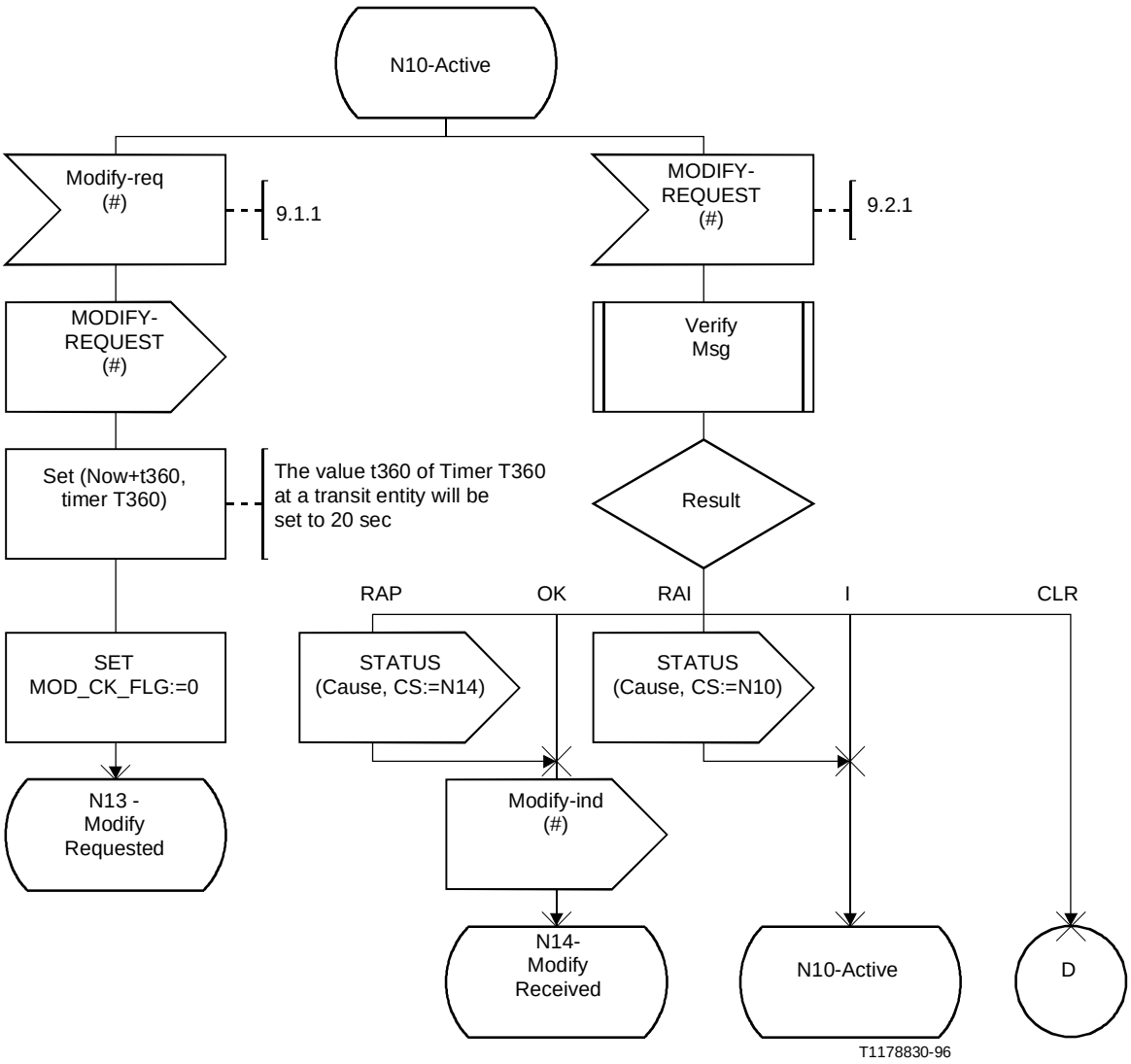


FIGURE 14-2/Q.2963.1 (sheet 1 of 7)

PROCESS Q.2931-N

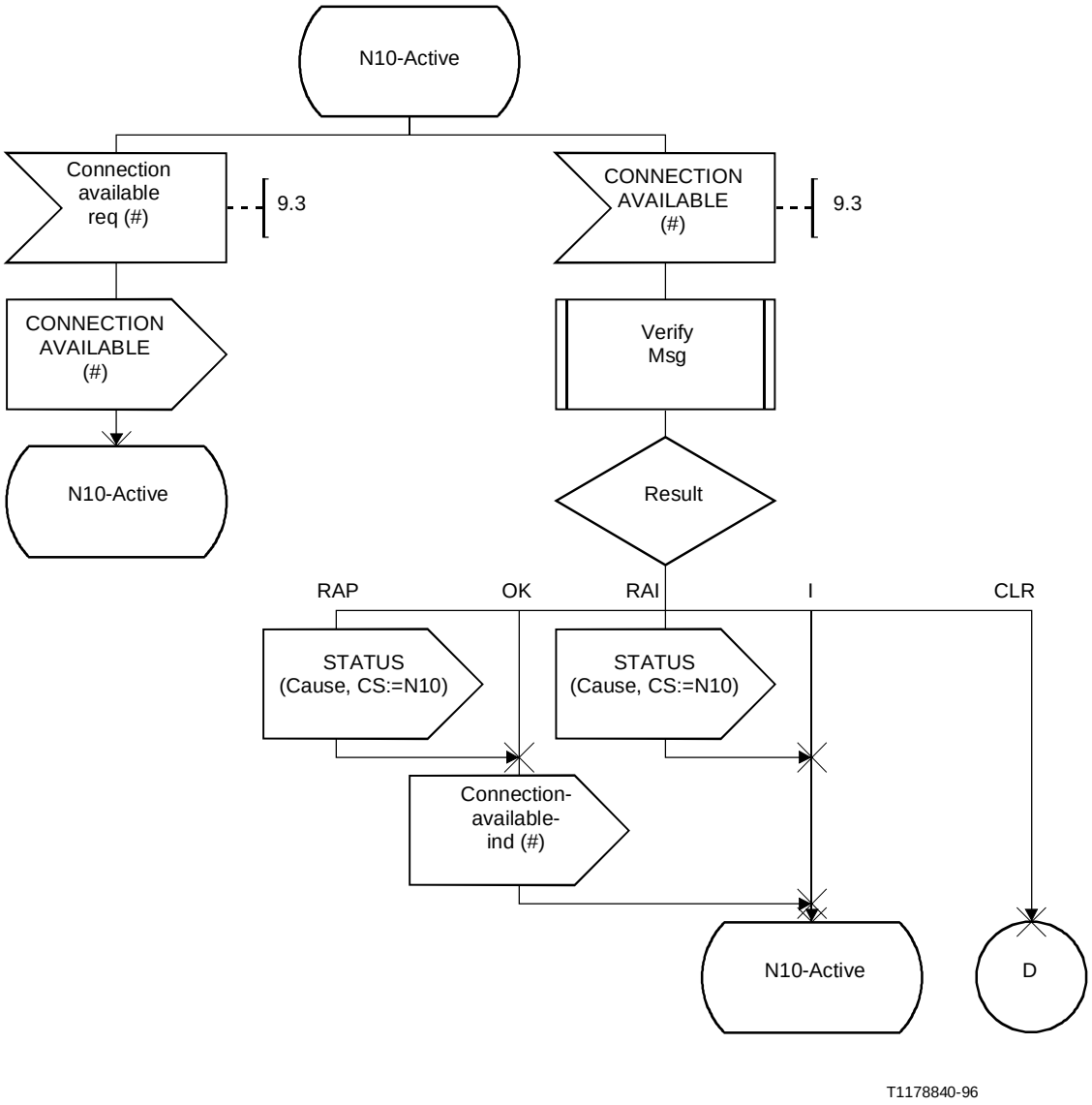


FIGURE 14-2/Q.2963.1 (sheet 2 of 7)

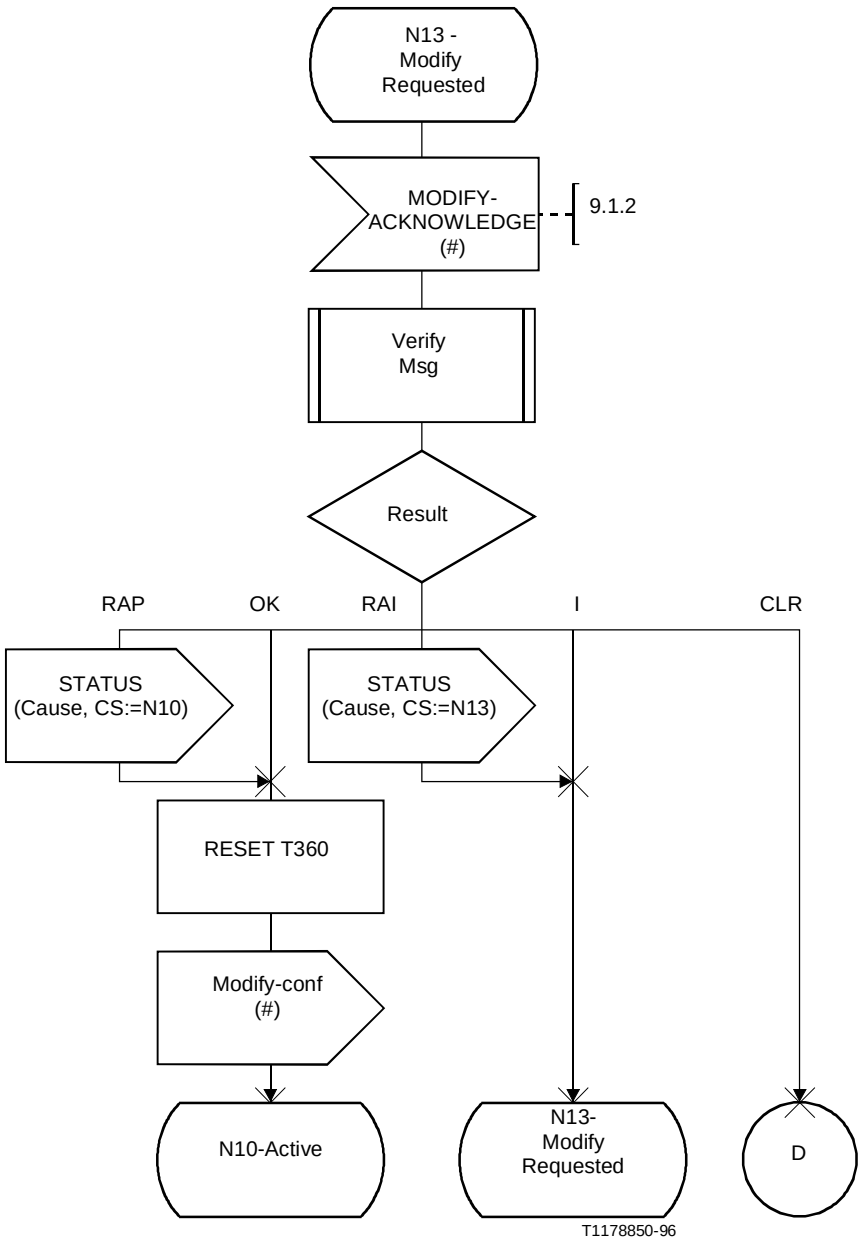


FIGURE 14-2/Q.2963.1 (sheet 3 of 7)

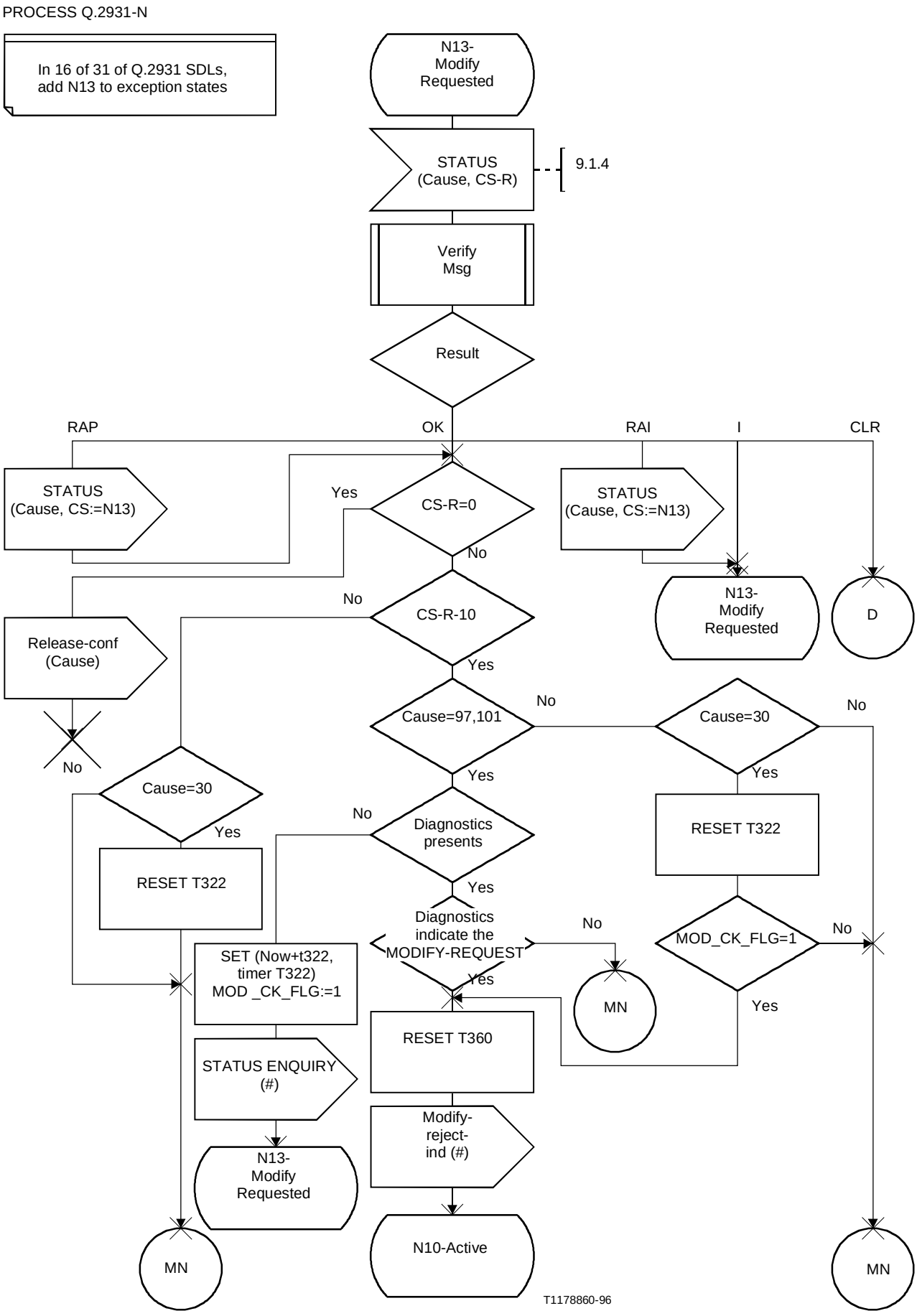


FIGURE 14-2/Q.2963.1 (sheet 4 of 7)

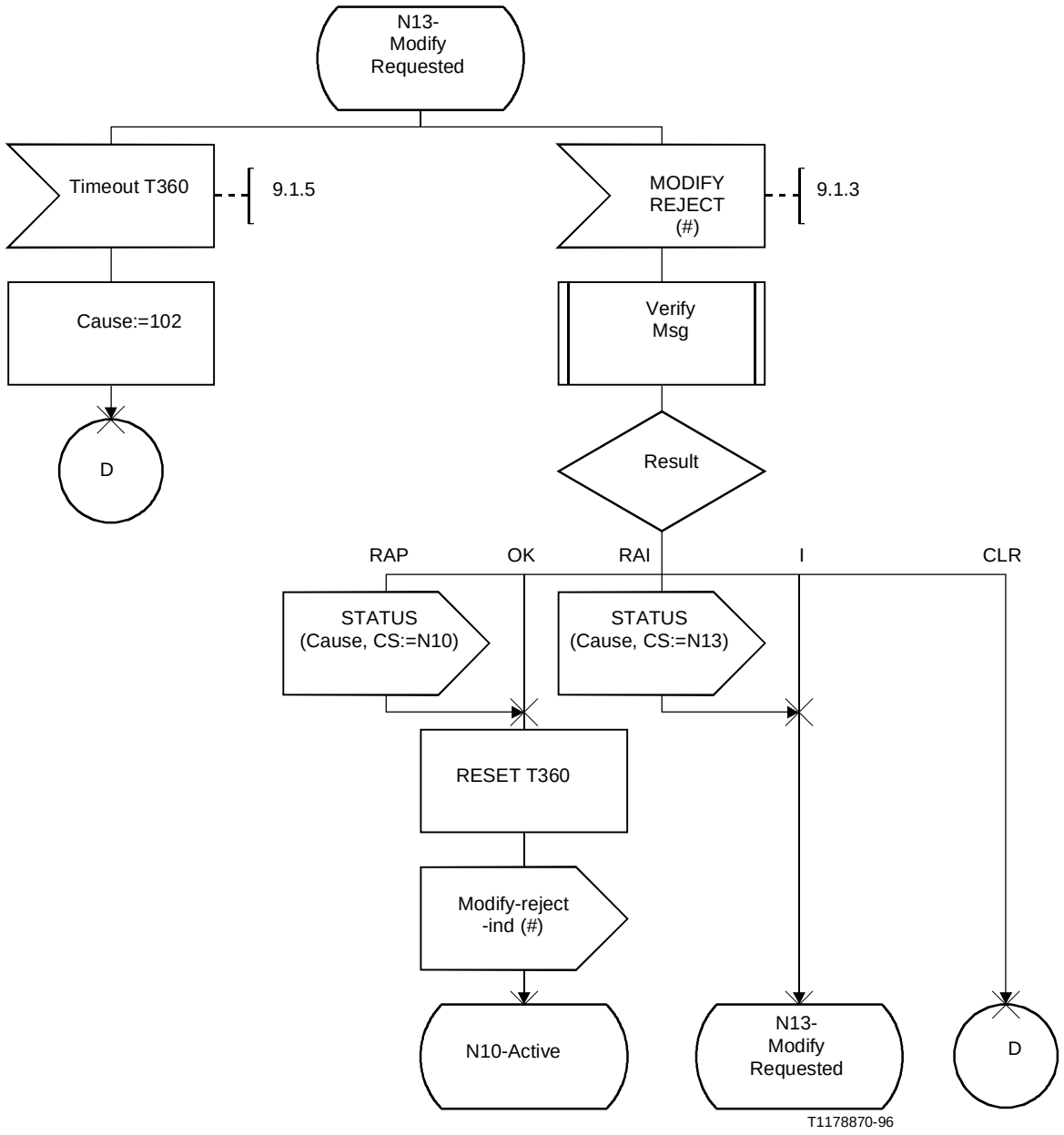


FIGURE 14-2/Q.2963.1 (sheet 5 of 7)

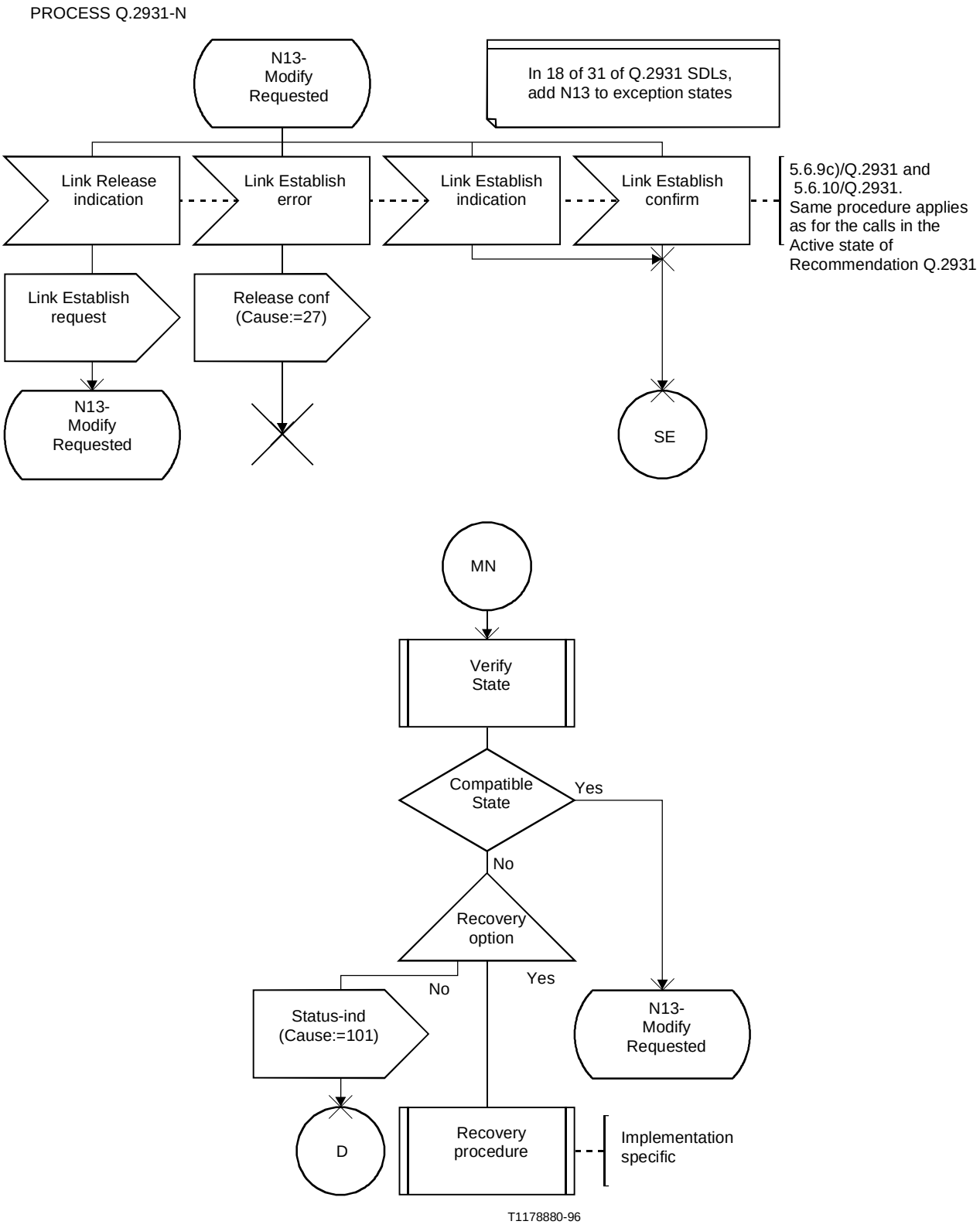


FIGURE 14-2/Q.2963.1 (sheet 6 of 7)

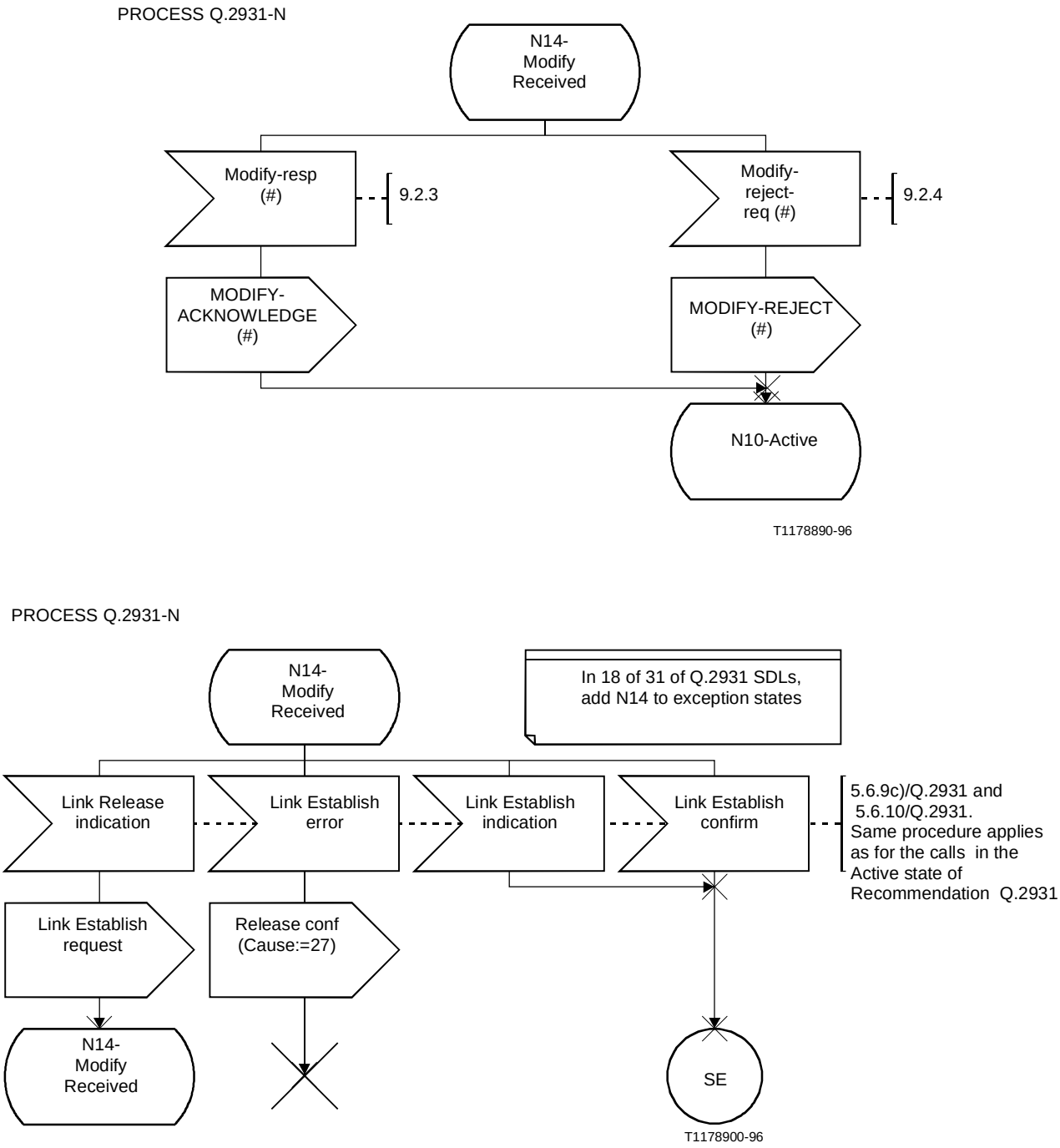


FIGURE 14-2/Q.2963.1 (sheet 7 of 7)

PROCESS Co-ord-U;

Q.2931 SDL - User Side
(Q.2963 Extensions)

Signal lists

Signal for B-ISDN Calls

Primitives to/from Application Process

| From AP | To AP |
|---|---|
| Modify-req | Modify-ind |
| Modify-resp | Modify-conf |
| Modify-reject-req | Modify-reject-ind |
| Connection-available-req | Connection-available-ind |

Primitives to/from Q.2931-U

Signal Lists

| CDtoOU | OUtoCD |
|---|---|
| Modify-req | Modify-ind |
| Modify-resp | Modify-conf |
| Modify-reject-req | Modify-reject-ind |
| Connection-available-req | Connection-available-ind |

Message to/from Q.2931-U to B-ISDN calls

Signal Lists

| CDtoOU | OUtoCD |
|---|---|
| MODIFY-REQUEST | MODIFY-REQUEST |
| MODIFY-ACKNOWLEDGE | MODIFY-ACKNOWLEDGE |
| MODIFY-REJECT | MODIFY-REJECT |
| CONNECTION-AVAILABLE | CONNECTION-AVAILABLE |

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FIGURE 14-3/Q.2963.1

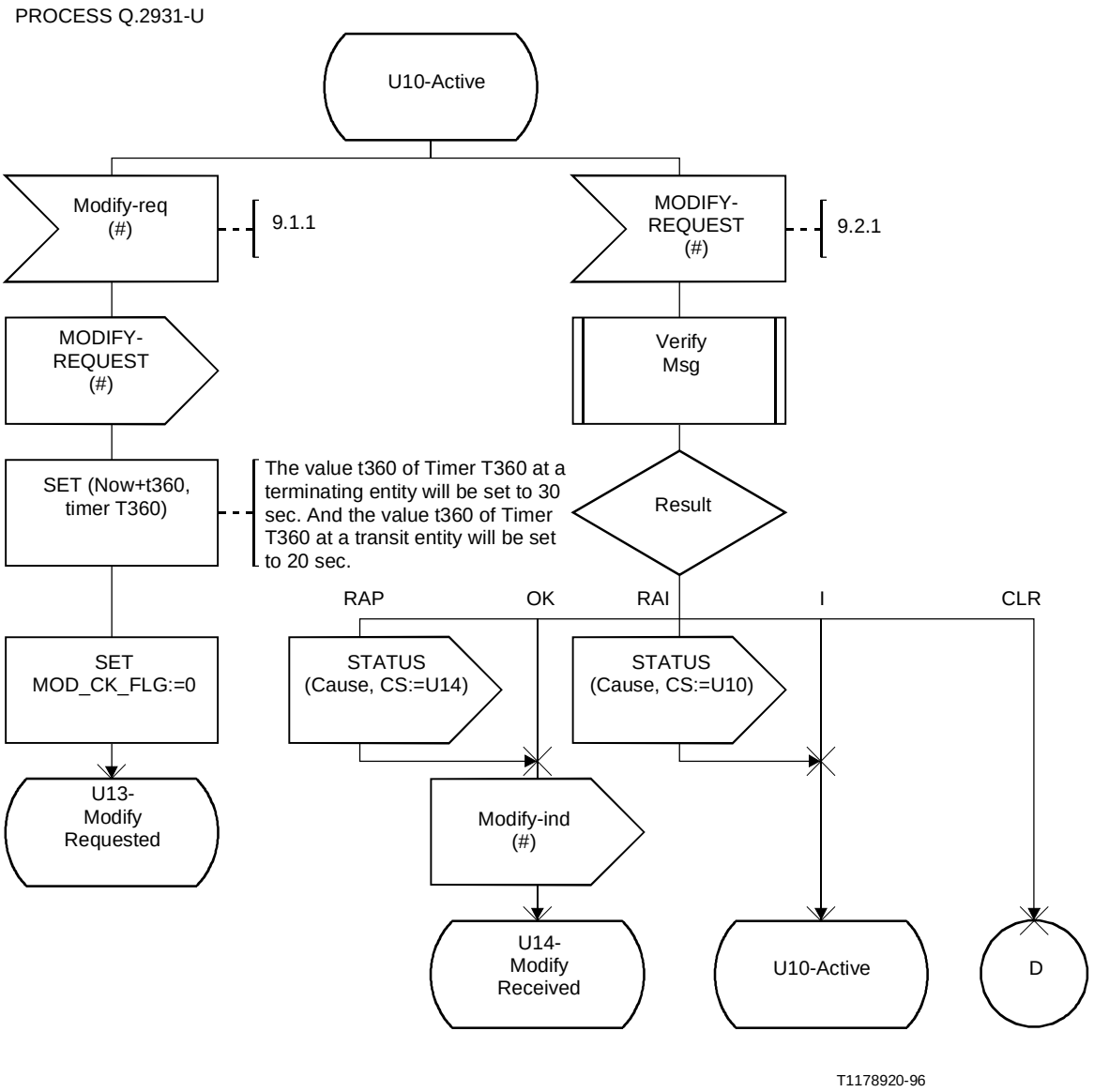



FIGURE 14-4/Q.2963.1 (sheet 1 of 7)

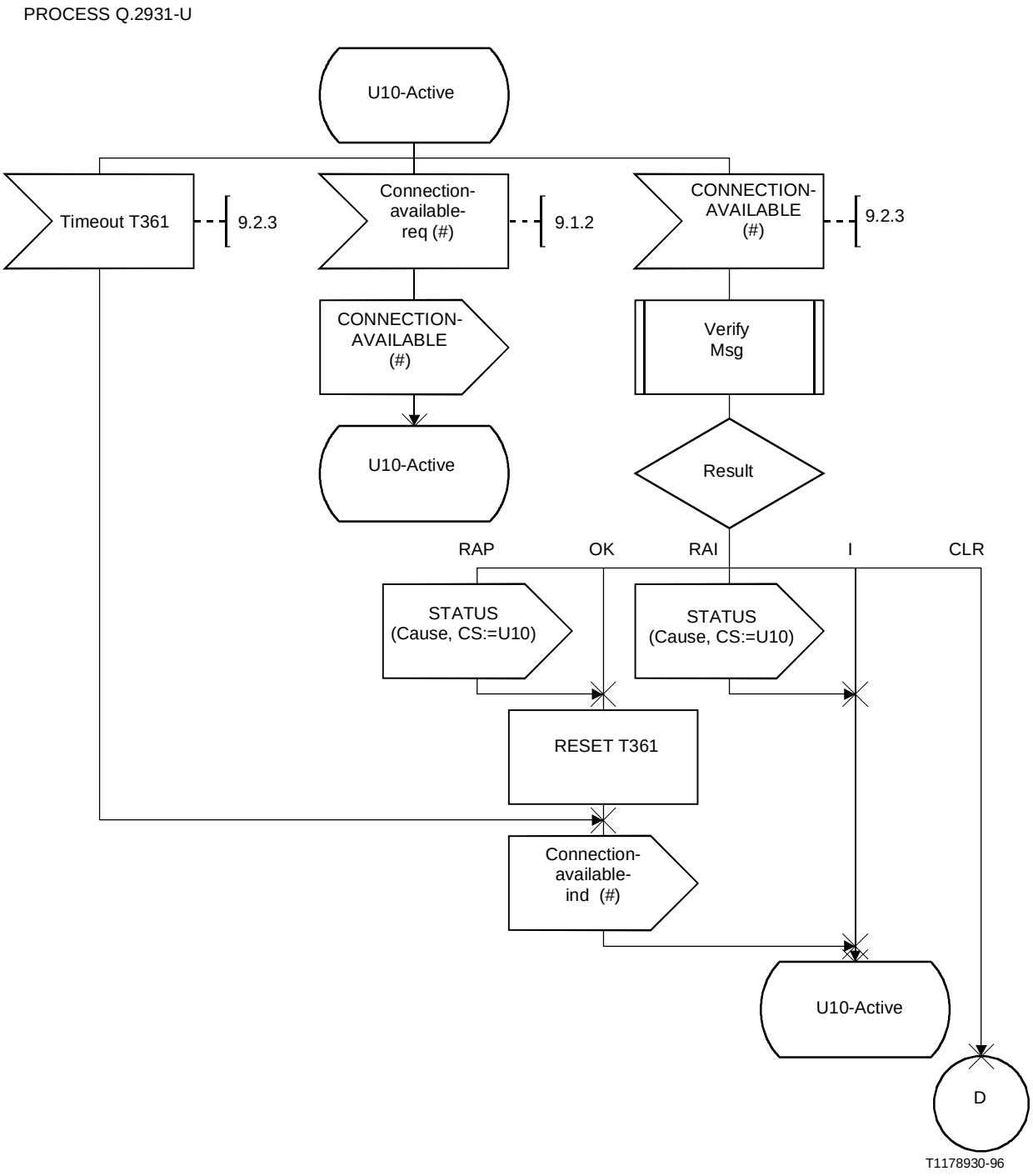



FIGURE 14-4/Q.2963.1 (sheet 2 of 7)

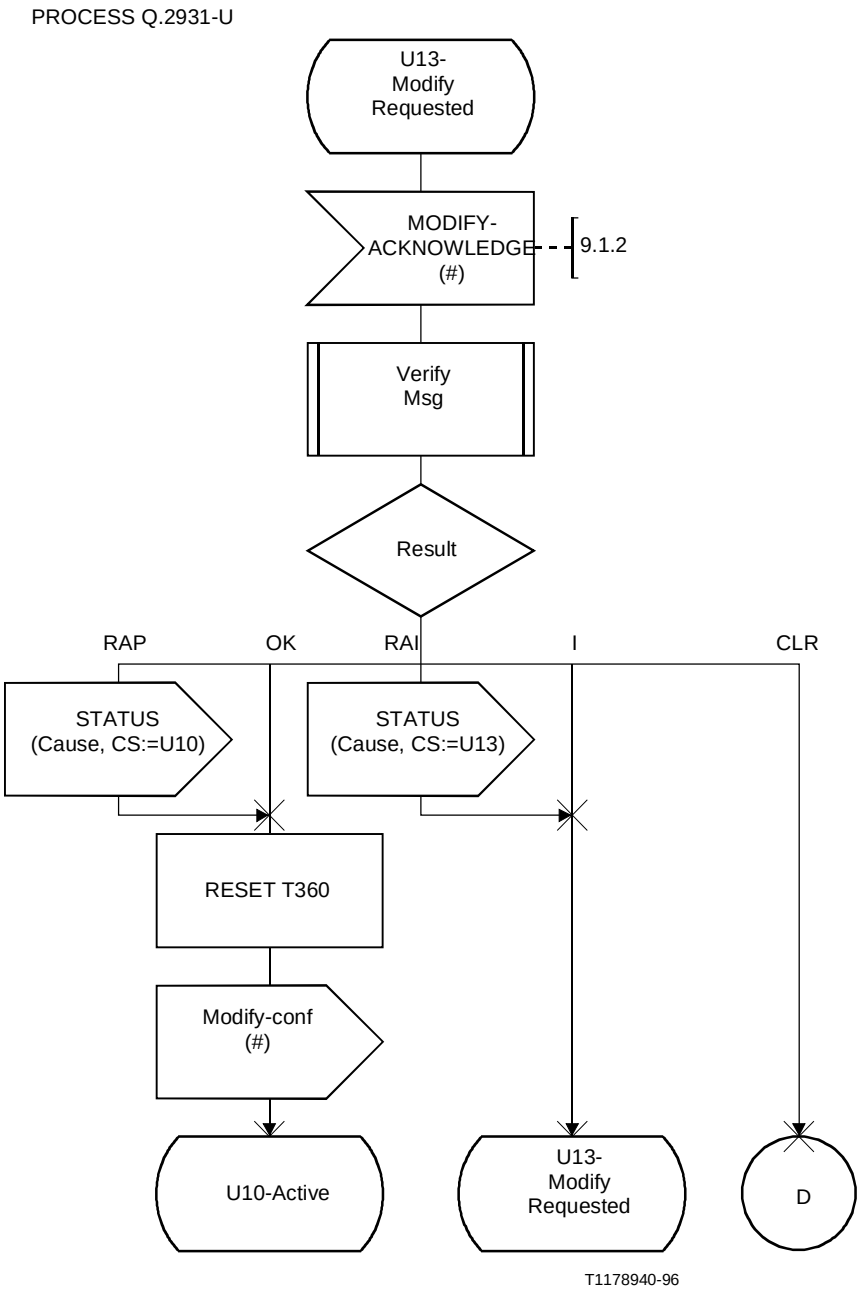



FIGURE 14-4/Q.2963.1 (sheet 3 of 7)

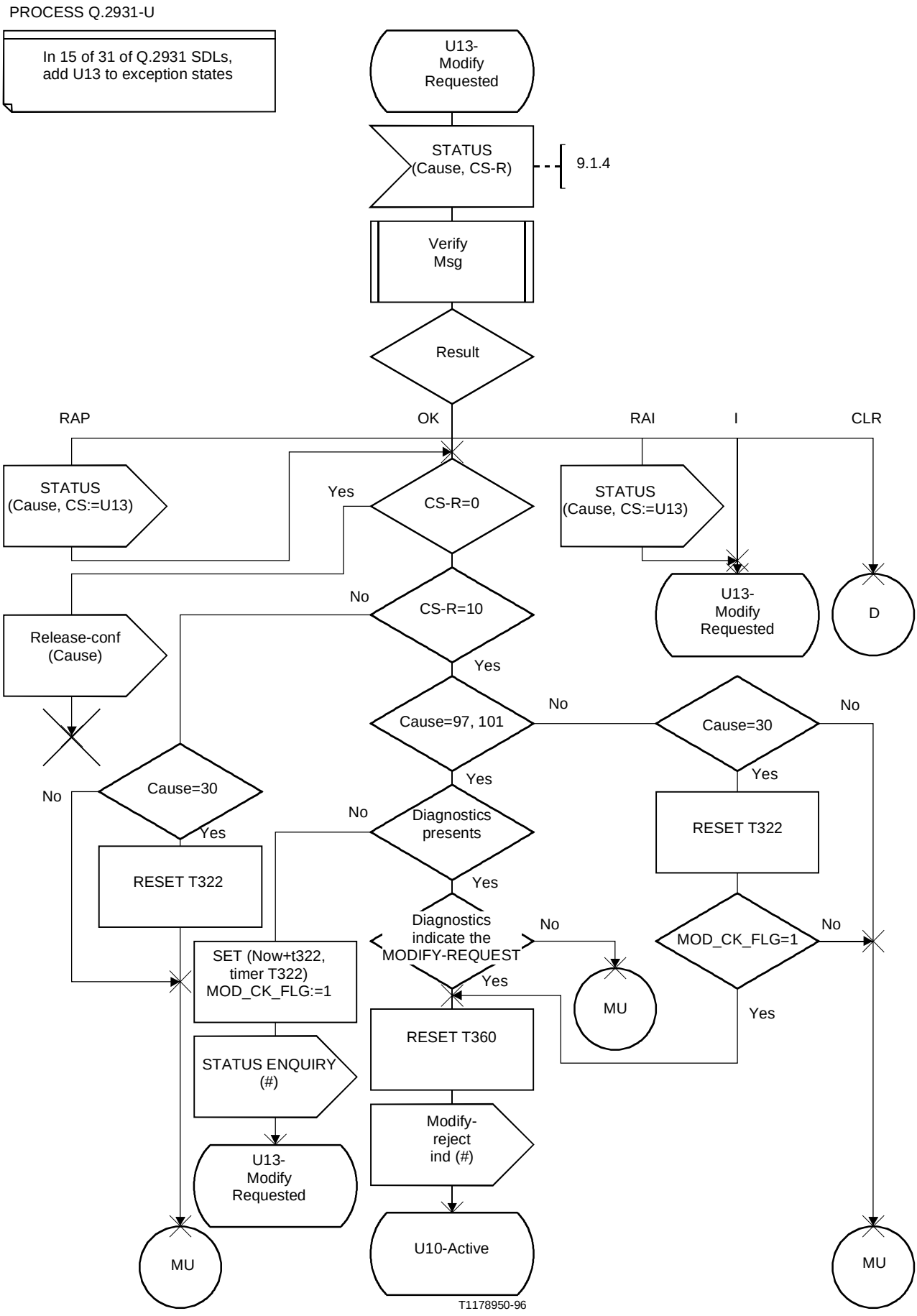



FIGURE 14-4/Q.2963.1 (sheet 4 of 7)

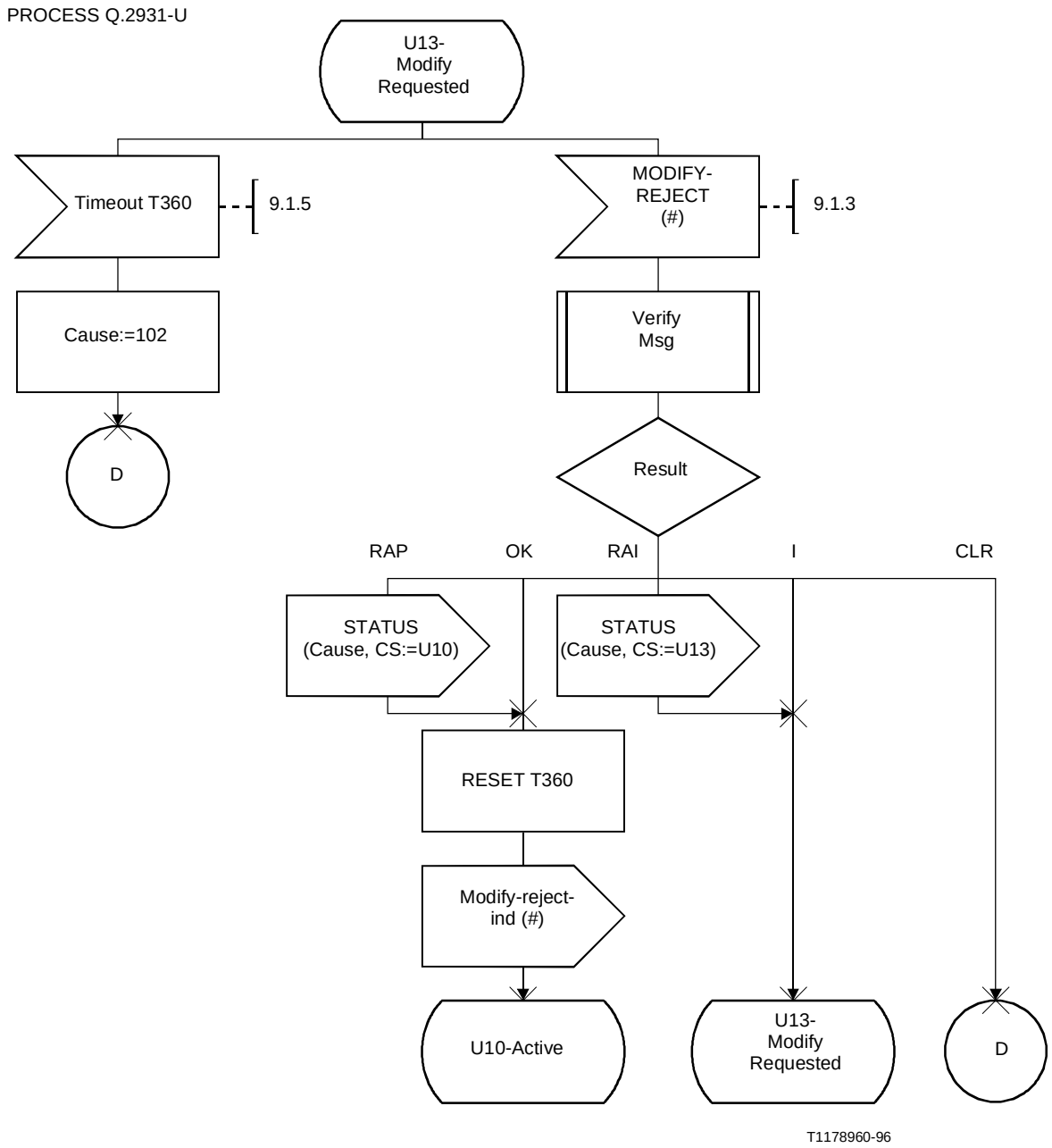



FIGURE 14-4/Q.2963.1 (sheet 5 of 7)

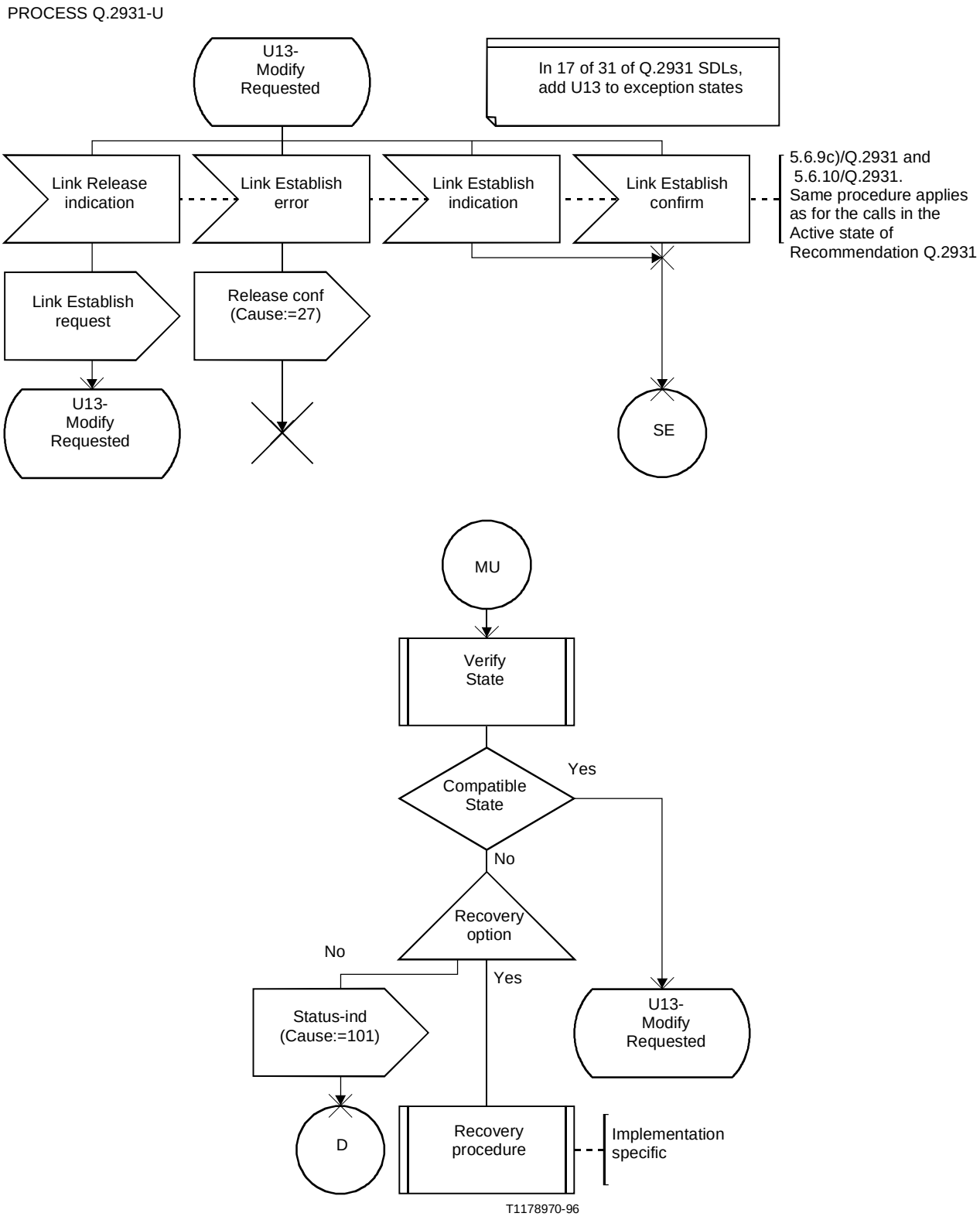
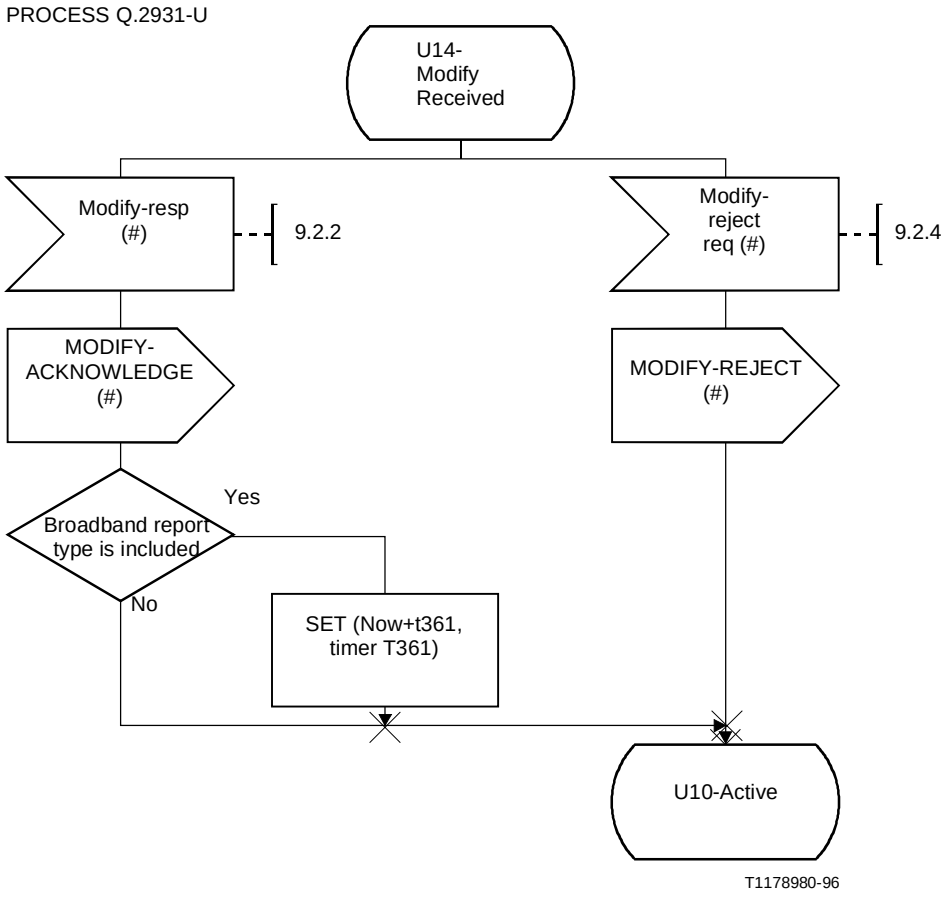



FIGURE 14-4/Q.2963.1 (sheet 6 of 7)



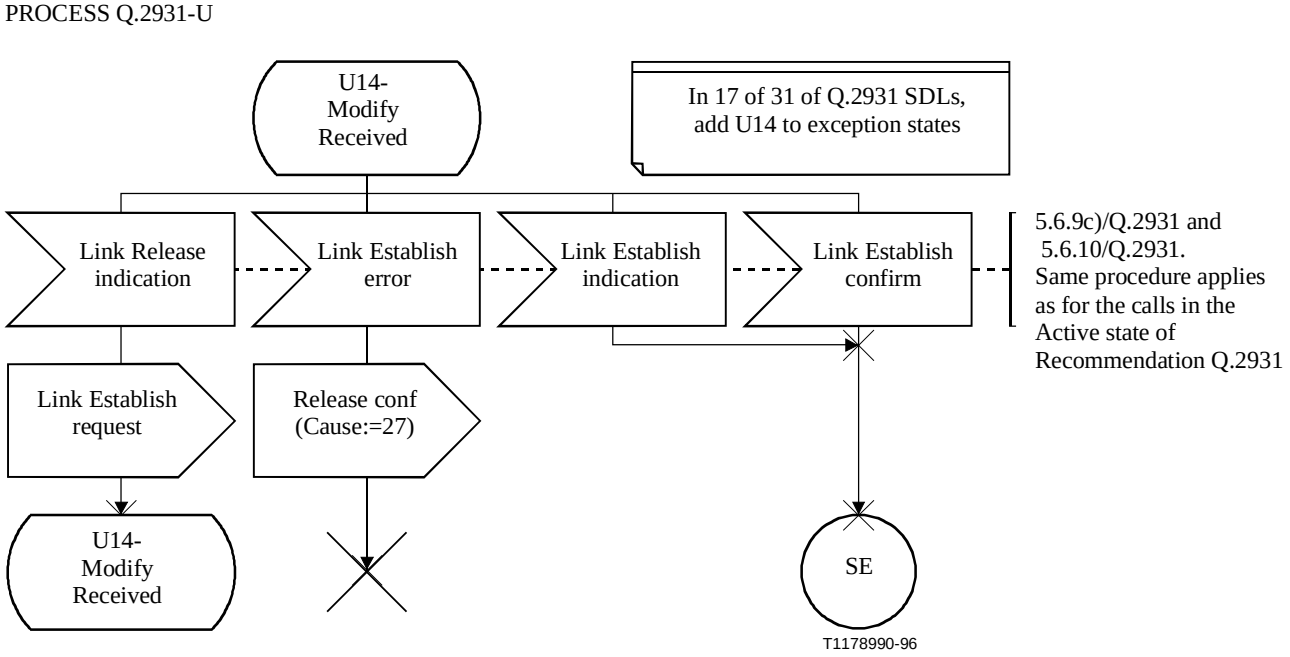
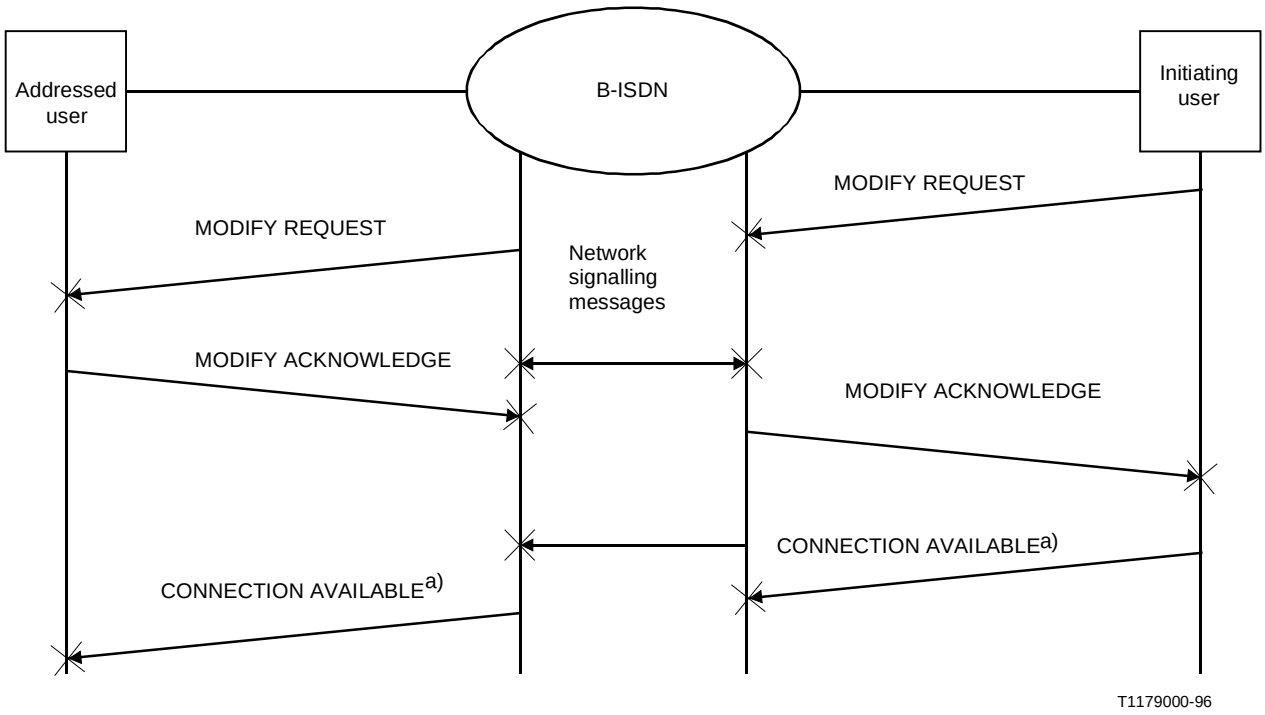




FIGURE 14-4/Q.2963.1 (sheet 7 of 7)

## Annex A

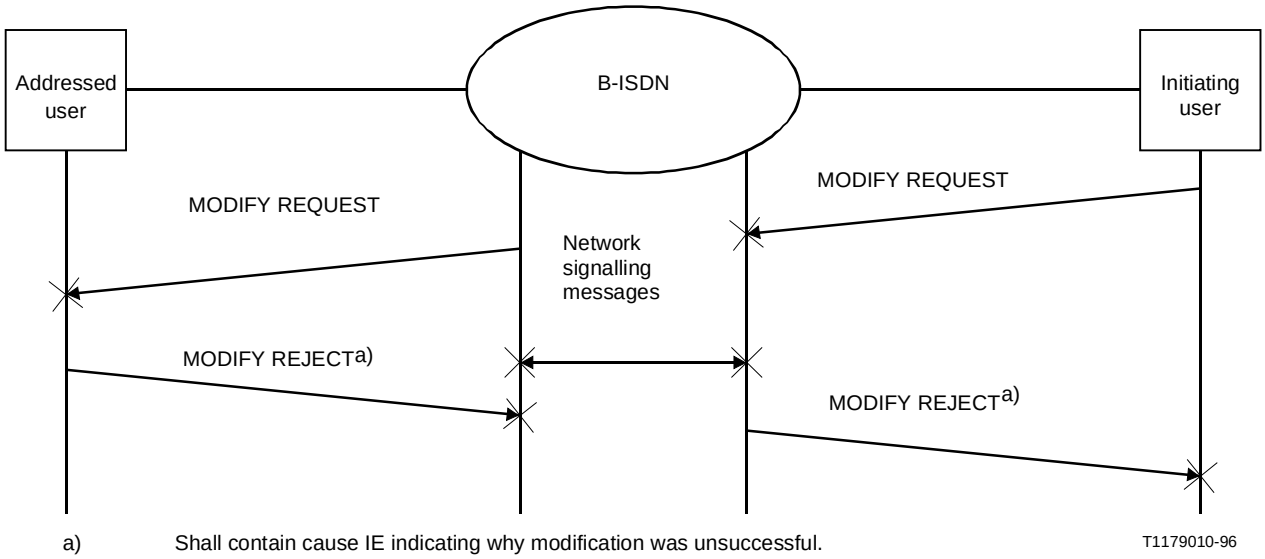
## Message flow diagrams for modification




a) This message is sent only if requested by the addressed user by including a broadband report type information element in the MODIFY ACKNOWLEDGE message.

FIGURE A.1/Q.2963.1

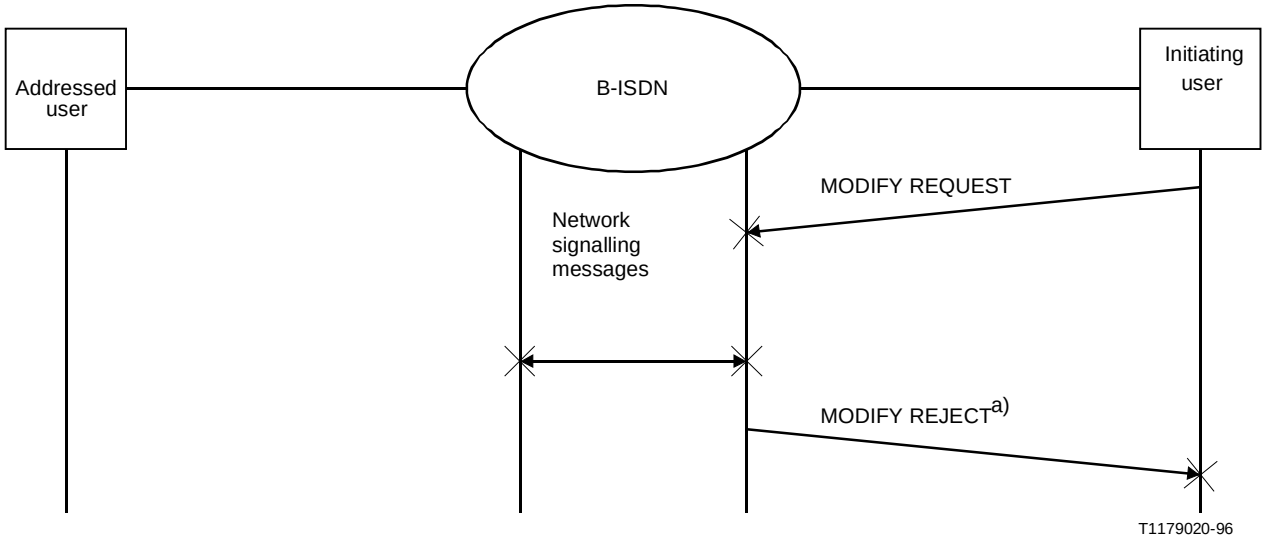
**Successful modification**




a) Shall contain cause IE indicating why modification was unsuccessful.

FIGURE A.2/Q.2963.1 (sheet 1 of 2)

**Unsuccessful modification**




a) Shall contain cause IE indicating why modification was unsuccessful.

FIGURE A.2/Q.2963.1 (sheet 2 of 2)

**Unsuccessful modification**

## Appendix I

### Example configuration of user and network behaviour during modification procedures

These examples (Figures I.1 and I.2) show the configuration in which both the initiating and the addressed users are terminating entities.

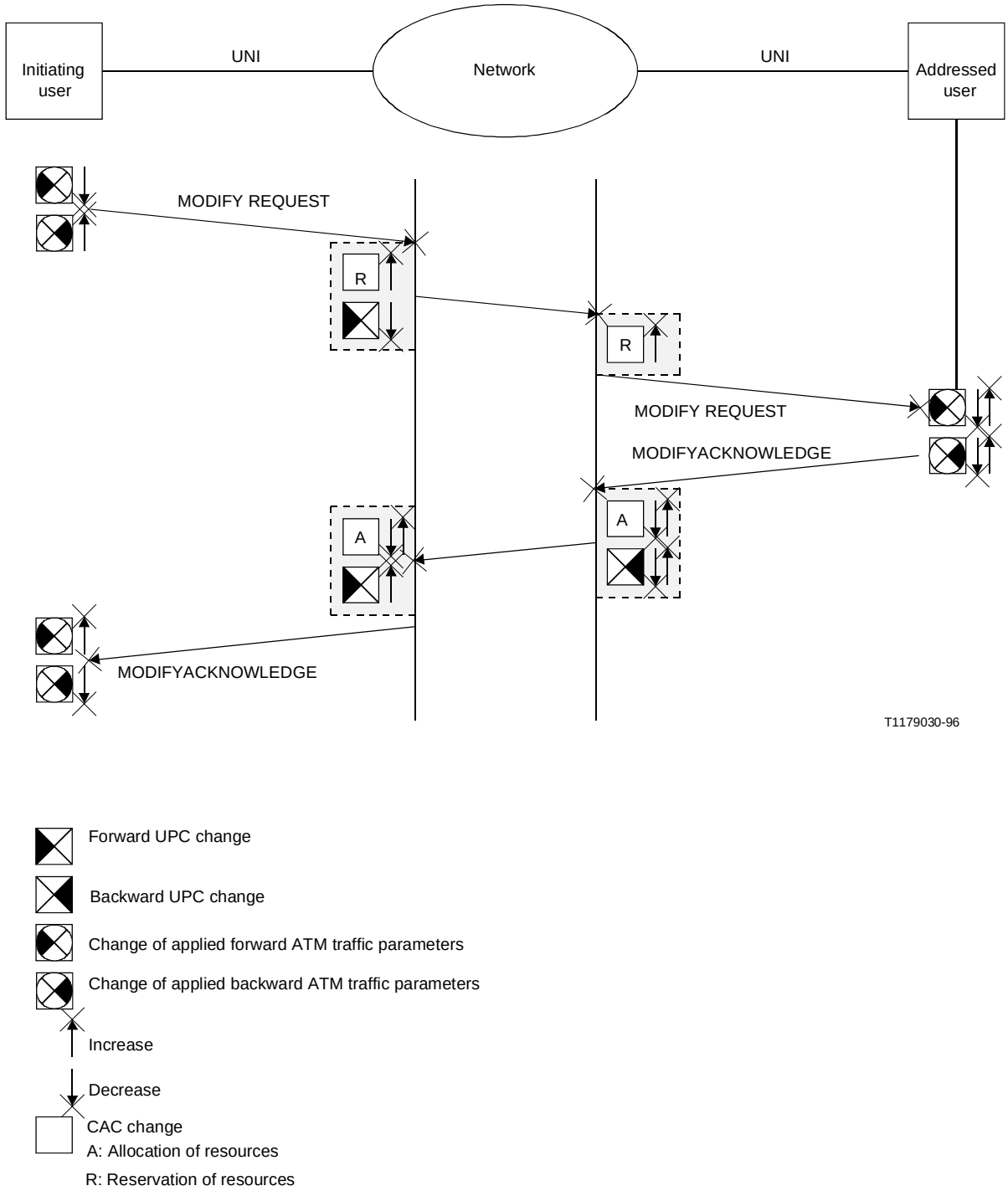



FIGURE I.1/Q.2963.1

**Procedure of modification without request of connection acknowledgement**

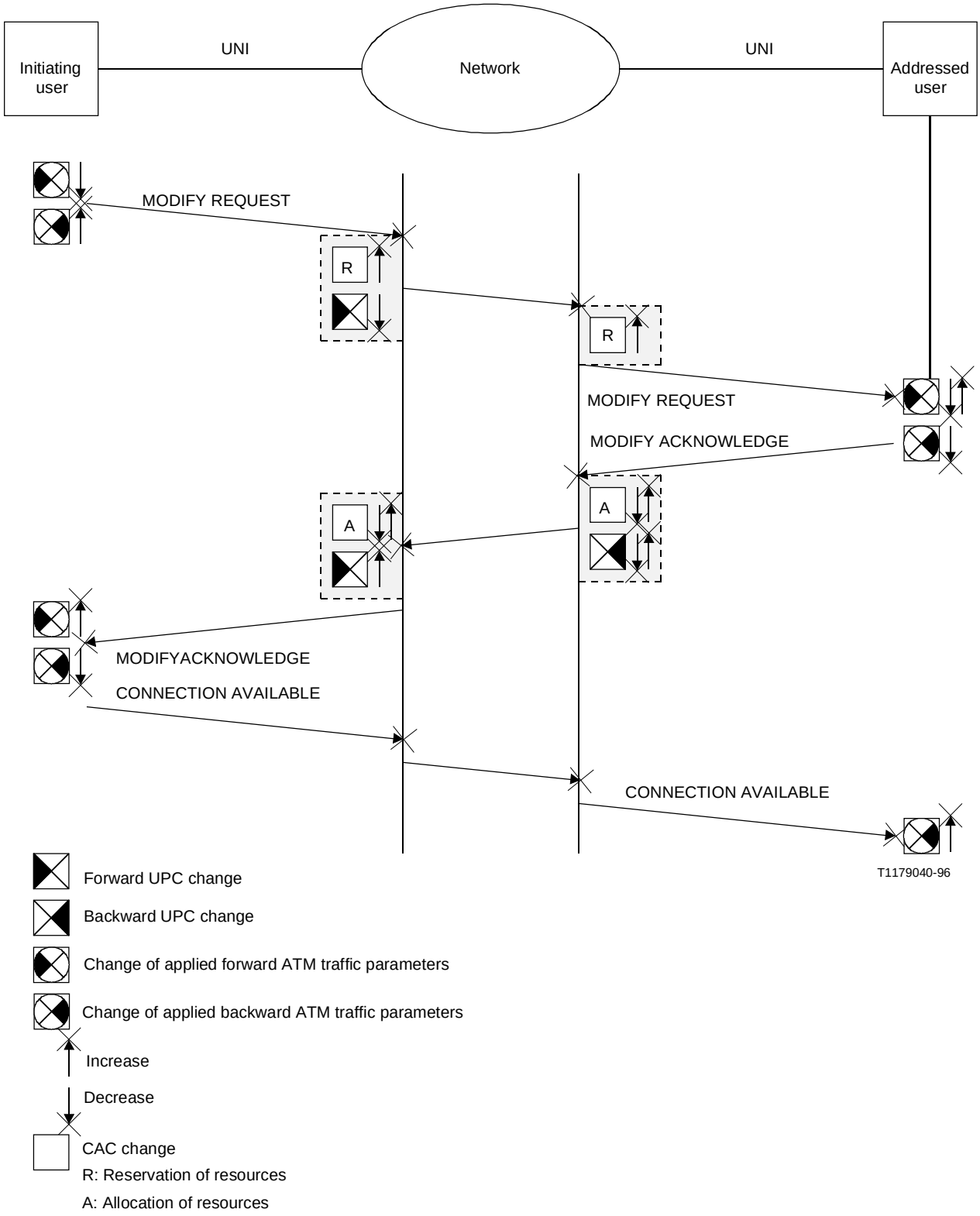



FIGURE I.2/Q.2963.1

**Procedure of modification with request of connection acknowledgement**

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