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SERIES I: INTEGRATED SERVICES DIGITAL NETWORK

Service capabilities – Supplementary services in ISDN

Call completion supplementary services: Completion of calls on no reply

ITU-T Recommendation I.253.4

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION I.253.4

CALL COMPLETION SUPPLEMENTARY SERVICES: COMPLETION OF CALLS ON NO REPLY

Summary

Completion of Calls on No Reply (CCNR) is an ISDN supplementary service offered to the calling user. The CCNR supplementary service enables the calling user A, upon encountering destination B, which does not answer the call (no reply), to be notified when destination B becomes free after having terminated an activity. If user A desires, then the network will reinitiate the call to the specified destination B.

Source

ITU-T Recommendation I.253.4 was prepared by ITU-T Study Group 1 (1993-1996) and was approved under the WTSC Resolution N° 1 procedure on the 19th of July 1996.

FOREWORD

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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 I.253.4

CALL COMPLETION SUPPLEMENTARY SERVICES: COMPLETION OF CALLS ON NO REPLY

(Geneva, 1996)

1 Definition

completion of Calls on No Reply (CCNR) enables a calling user A, encountering a destination B, which does not answer the call (no reply), to be notified when the destination B becomes free after having terminated an activity, and to have the network reinitiate the call to the specified destination B if user A desires.

2 Description

2.1 General description

The CCNR supplementary service is applicable to users who are connected to the network via a basic access or a primary rate access.

When user A encounters a destination B, which does not answer the call (no reply), user A may request CCNR on destination B.

When user A requests the CCNR supplementary service, the network will monitor for destination B's becoming free after having terminated an activity.

When destination B becomes free after having terminated an activity, the network will wait a short time (as defined by the destination B idle guard timer) in order to allow the resources to be reused for originating a call. If resources are not reused by destination B within this time, then the network will automatically recall user A.

When user A accepts the CCNR recall, then the network will automatically generate a CCNR call to destination B.

2.2 Specific terminology

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

2.2.1 **user A**: The user who originated the call and to whom the CCNR supplementary service is provided.

2.2.2 **destination B**: The entity that was addressed in the original call set-up.

2.2.3 **CCNR request**: An instance of an activation of the CCNR supplementary service which is held in a queue pending the correct conditions for the CCNR supplementary service to be completed.

2.2.4 **CCNR recall**: A network to user indication, informing user A that the network is ready to initiate a CCNR call to destination B and that the network is awaiting a response to this indication.

2.2.5 **CCNR call**: Call set-up by the network from user A to destination B resulting from user A's acceptance of a CCNR recall.

2.2.6 **busy**: See clause 3/I.221.

2.2.7 free: Destination B is free when it is neither busy nor channels busy.

2.2.8 CCNR busy: Any one of the following conditions will cause user A to be considered as CCNR busy:

– maximum number of calls reached at user A;

– no B-channels available at user A;

– CCNR recall pending on user A.

2.29 retention timer: This timer specifies the amount of time the network retains all of the information supplied by the calling user if the call is terminated while destination B is being informed of the call. Although this timer is optional for the basic call procedures it is needed for the operation of the CCNR supplementary service. The minimum value of the timer shall be 15 seconds.

2.2.10 CCNR service duration timer: This timer specifies the maximum time the CCNR supplementary service will remain active for user A within the network. The value of this timer is a network option, typically 60-180 minutes.

2.2.11 CCNR recall timer: This timer specifies the maximum time the network shall wait for a user A response to a CCNR recall. The value of this timer is between 10 and 20 seconds.

2.2.12 destination B idle guard timer: This timer specifies the amount of time the network will delay after destination B has become free, after having terminated an activity, before informing user A. The value of this timer is between 0 and 15 seconds.

2.2.13 compatible terminal: A terminal which can support the bearer service or teleservice requested for the original call to destination B and which can accept calls to the ISDN number and subaddress identifying the called user in the original call to destination B.

2.2.14 activity: Answering an incoming call or originating an outgoing call.

2.3 Qualifications on the applicability to telecommunication services

The CCNR supplementary service may be applicable to all circuit-mode bearer services defined in Recommendation I.230, and all teleservices defined in Recommendation I.240 with the following exceptions:

a) call 2 of the videotelephony teleservice (see Recommendation F.721);

b) all other circuit-switched telecommunications services requiring the use of more than one B-channel.

3 Procedures

3.1 Provision/withdrawal

The CCNR supplementary service may be provided to user A after prior arrangement with the service provider or may be generally available.

The CCNR supplementary service shall be withdrawn by the service provider upon request of the subscriber or for service provider reasons.

As a service provider option, the CCNR supplementary service can be offered with a subscription option which may apply to the whole access of the user A. The subscription option is detailed in Table 1.

TABLE 1/I.253.4

Subscription option	Values
Recall mode	– CCNR recall offered to all terminals on the access – CCNR recall offered to the terminal that has activated the CCNR supplementary service

If the subscription option is not offered, one of the two values shall be chosen by the service provider.

As a network option, the presence of compatible terminals at the destination may be verified.

3.2 Normal procedures

3.2.1 Activation/deactivation/registration

3.2.1.1 Activation

When user A encounters a destination B, which does not answer the call (no reply) and the CCNR supplementary service can be requested against this destination, the network shall retain the call information. User A can activate the CCNR supplementary service while the called user is being informed of the call and after the call is terminated before the retention timer is expired.

Upon receipt of a request for the activation of the CCNR supplementary service, the network shall stop informing destination B of the call and shall store the identification of the destination contained in the original call request. User A shall be informed that the activation was successful. Multiple requests against destination B shall be queued.

When the activation of the CCNR supplementary service is accepted, the CCNR service duration timer is started. The network shall monitor for destination B's becoming free after having terminated an activity.

User A can have a limited number of CCNR requests outstanding. This limit is a service provider option with a maximum value of five. The requests can be to different destinations, or can be to the same destination with different service requirements (e.g. bearer service or teleservice requirements) or as a service provider option with the same service requirements.

Destination B can have a limited number of incoming CCNR requests outstanding. This limit is a service provider option with a maximum value of five.

Having activated the CCNR supplementary service, user A can originate calls and receive calls as normal.

3.2.1.2 Deactivation

The following deactivation requests shall be made available to user A:

1) deactivate a specific user A CCNR request. This request may contain enough information to correlate with the initial activation;

2) deactivate all outstanding CCNR requests.

Upon successful deactivation, the corresponding CCNR request shall be discarded.

User A shall be informed that the deactivation has been successful. If a specific CCNR request is deactivated, the network may indicate which specific CCNR request has been deactivated.

If the recall mode is "CCNR recall offered to all terminals", then user A can deactivate any outstanding CCNR requests stored for that user from any of the user A's terminals.

If the recall mode is "CCNR recall offered to the terminal which has activated the CCNR supplementary service", then user A can deactivate only those outstanding CCNR requests, made from that specific terminal.

3.2.1.3 Registration

Not applicable.

3.2.2 Erasure

Not applicable.

3.2.3 Invocation and operation

When destination B receives a CCNR request, the network shall wait for an activity at destination B.

When destination B becomes free after terminating an activity, or when a CCNR request becomes not suspended and destination B is free, then the destination B CCNR queue shall be processed, provided that an entry in the destination B CCNR queue is not currently being processed. Entries shall not be processed in parallel.

The first request which is not suspended and which uses the same basic bearer service or basic teleservice as used in the activity shall be selected. The network shall reserve on destination B's interface the resources (e.g. a B-channel) which are necessary to complete the CCNR call. Destination B can use the reserved access resources or other free resources, in order to originate a call. An incoming call shall not use these reserved resources.

A check for the existence of a compatible terminal which is free at destination B shall be performed. The network assumes that all terminals can indicate their compatibility.

NOTE – Some networks may not provide the compatibility check.

If the compatibility check is performed and is unsuccessful; further requests which are not suspended shall be examined. In all other cases, the network shall start the destination B idle guard timer.

When the destination B idle guard timer expires, then, provided that interface resources are still available at destination B, and, provided that if a compatibility check has been done, a compatible terminal at destination B is still free, user A shall be informed.

If user A is neither busy nor CCNR busy, then user A shall be recalled with an indication that it is a CCNR recall and with an indication to which CCNR request it applies. Then the CCNR recall timer shall be started.

If user A accepts the recall before the CCNR recall timer expires, then user A's network shall initiate the CCNR call to destination B. When the network receives an indication that the destination B is being informed of the CCNR call, the corresponding CCNR request shall be considered as completed.

While the idle guard timer is running, and also whilst awaiting the CCNR call to destination B, a new incoming call shall not be offered to destination B if it has service requirements and destination selection information identical to the (not suspended) request which is currently being processed in the destination B CCNR queue.

For such incoming calls, the called user shall be considered as being busy and the calling user shall be informed as for basic call procedures.

The CCNR requests in the destination B CCNR queue shall be processed in the order they are received. During the processing of the destination B CCNR queue, CCNR requests which are currently suspended are ignored.

If, for any reason, no CCNR call results from the processing of a CCNR request, then provided that access resources are still available at destination B, the next request in the destination B CCNR queue shall be selected for processing. This procedure shall be repeated until the processing of the destination B CCNR queue is complete.

If, for any reason, no CCNR call results from the processing of a CCNR request and the access resources are no longer available at destination B, then the resources reserved for the CCNR supplementary service shall be released and the network shall monitor for destination B's becoming free after having terminated an activity.

If all of the destination B CCNR queue has been processed and no CCNR call results, then processing is complete and the resources reserved for the CCNR supplementary service shall be released.

If requests which are not suspended exist in the destination B CCNR queue, then:

– if destination B is busy, the network shall monitor for destination B's becoming free after having terminated an activity; or

– if destination B is free, then destination B CCNR queue shall be processed again.

3.2.4 Interrogation

User A can request the status of the CCNR supplementary service. In response to the request the following information may be provided:

1) in response to a general request, user A shall be given a list of the addresses against which CCNR requests are outstanding; or

2) in response to a specific request concerning one particular address, user A shall be informed whether or not user A has a CCNR request outstanding against that address.

NOTE – In both cases, the network provides information relating to CCNR requests and it is a matter for terminal implementation whether or not the user is given information about CCNR requests which are not compatible with the terminal.

3.3 Exceptional procedures

3.3.1 Activation/deactivation/registration

3.3.1.1 Activation

The activation of the CCNR supplementary service shall be rejected if the user has not subscribed to the CCNR supplementary service.

If user A activates the CCNR supplementary service and disconnects, and at the same time destination B is answering the call, the CCNR request shall be accepted.

If the network cannot accept user A's request to activate the CCNR supplementary service, the network shall inform user A and give one of the following reasons:

1) Short-term denial: The network temporarily cannot accept user A's request to activate the CCNR supplementary service. A later attempt to activate the CCNR supplementary service for the same destination B may succeed. This reason will be given e.g.:

   – if user A has reached the limit of CCNR requests outstanding; or
   – if there are already the maximum number of requests queued against destination B; or

– if there is an interaction with a supplementary service which temporarily prevents the activation of the CCNR supplementary service.

2) Long-term denial: The network cannot accept user A's request to activate the CCNR supplementary service and a later attempt to activate the CCNR supplementary service for the same destination B will also be rejected. An example of long term-denial is where destination B's network does not support the CCNR supplementary service or does not support the CCNR supplementary service for the requested basic bearer service or basic teleservice.

If destination B is busy when the CCNR request arrives, then the CCNR request shall be accepted. Normal procedures shall apply, as described in 3.2.1.1.

3.3.1.2 Deactivation

A CCNR request shall be automatically deactivated by the network(s) and user A shall be informed if:

1) the CCNR service duration timer expires; or

2) user A does not accept the CCNR recall before the CCNR recall timer expires; or

3) destination B invokes a service that conflicts with the existing CCNR request and deactivation becomes necessary.

The user shall only be given information about deactivation of a CCNR request if that user would have been given the CCNR recall associated with that CCNR request.

3.3.1.3 Registration

Not applicable.

3.3.2 Erasure

Not applicable.

3.3.3 Invocation and operation

3.3.3.1 Exceptional situation at destination B’s side

The following situations can occur at the destination B's side:

a) Resources or compatible terminal at destination B no longer available when the destination B idle guard timer expires:

If, when the destination B idle guard timer expires, no access resources are available at destination B, then processing of the destination B CCNR queue shall cease. The network shall monitor for destination B's becoming free and the procedures of 3.2.3 shall then apply.

If, when the destination B idle guard timer expires, a compatibility check is made and no compatible terminal(s) at destination B is free then the next request in the destination B CCNR queue shall be selected for processing.

b) Destination B is busy upon arrival of CCNR call or does not reply to the CCNR call:

If destination B is busy when the network attempts to make the CCNR call, or does not reply to the CCNR call, then as a service provider option, either:

– the corresponding CCNR request shall be deactivated. If destination B is busy, user A can activate the completion of calls to busy subscriber supplementary service (see Recommendation I.253.3). If destination B does not reply to the CCNR call, then if user A activates the CCNR supplementary service again, this activation shall be considered as a new CCNR request, which will be put at the end of the CCNR queue; or

– the original CCNR request shall retain its position in the queue, and the CCNR service duration timer shall not be restarted. The processing of the queue shall be interrupted until the next activity of destination B. If user A attempts to activate the CCNR supplementary service again, this shall be treated as described in 3.3.3.2 c).

NOTE – It is the responsibility of networks supporting the option to retain the original CCNR request to provide interworking with those networks that do not.

c) Destination B rejects the CCNR call:

If destination B does reject the CCNR call, then the CCNR request shall be deactivated and the processing of the queue shall continue. User A is informed according to the basic call procedures.

3.3.3.2 Exceptional situation at user A's side

The following situation can occur at user A's side:

a) Non-acceptance or rejection of the CCNR recall:

If user A rejects the CCNR recall or the CCNR recall timer expires, then the CCNR request shall be deactivated.

b) User A is found to be busy or CCNR busy:

If user A is found to be busy or CCNR busy at the time of the recall, then user A shall be notified and the CCNR request shall be suspended until user A becomes either free as well as not CCNR busy. The network shall receive no response from user A to this notification.

When a CCNR request becomes not suspended due to user A becoming either free as well as not CCNR busy, then user A's CCNR requests associated with the bearer services and/or teleservices for which user A is considered free shall become not suspended and the procedures of 3.2.3 shall apply.

c) User A reactivates the CCNR supplementary service:

If user A does not wait for the CCNR recall to a particular destination B, but makes another call to the same destination B which does not answer the call (no reply) again and requests the CCNR supplementary service again then, as a network option, one of the following shall occur:

1) the network shall check if an identical CCNR request already exists:
   – if so, then the original request shall be retained with the current request being discarded and user A shall be informed that the request has not been accepted because a CCNR request had already been stored against the requested destination B;
   – if not, then the network shall treat this as a new CCNR request.

   In order to determine that two CCNR requests are identical, the network shall only compare the basic call information, i.e. the bearer service and teleservice requirements, the destination selection information, and calling user identity (if any); or
2) the network shall not check if any identical CCNR request already exists and the procedures of 3.2.1.1 shall apply for this new CCNR request.

d) No resources available at user A when user A accepts the CCNR recall:

If user A accepts the CCNR recall but there are insufficient resources for the CCNR call available at user A's access, then user A shall be informed and the CCNR request shall be suspended until user A becomes free again.

3.3.3.3 Network congestion

If the CCNR call encounters network congestion, then user A shall be informed as for the basic call procedures. In addition, the CCNR request shall be deactivated and user A shall be informed accordingly.

3.3.4 Interrogation

If there are no CCNR requests outstanding when user A requests a general interrogation, user A shall be explicitly informed.

3.4 Alternate procedures

3.4.1 Activation/deactivation/registration

None identified.

3.4.2 Invocation and operation

None identified.

4 Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-series are expected to contain that information. It shall be possible to charge the subscriber accurately for the service.

5 Interworking considerations

When user A and destination B belong to different networks, then the CCNR supplementary service can operate successfully only if all networks involved support the CCNR supplementary service.

5.1 Interworking with non-ISDNs

If destination B resides within a non-ISDN which supports CCNR service functionality, then the CCNR supplementary service may be supported.

When the call passes from one network to another network that cannot determine the termination of an activity, the CCNR request will not be accepted and the CCNR supplementary service will not be activated.

5.2 Interworking with private ISDNs

Where the CCNR supplementary service involves users attached to the public ISDN and private ISDN, then, for the supplementary service to be successful, these networks need to interwork on a cooperative basis. This interworking needs to take account of the fact that one network cannot directly monitor a user attached to the other network.

Where a private ISDN supports the CCNR supplementary service, then this information will be registered with the public network in order to support destination Bs who are attached to the private ISDN.

In order to request the activation of the CCNR supplementary service in the public ISDN, subscription will be necessary as normal.

NOTE – The subscription option "recall mode" does not apply at the interface between the public ISDN and the private ISDN.

6 Interaction with other supplementary services

Unless stated otherwise below, the supplementary services requested for the original call shall be used in association with the CCNR call.

6.1 Advice of charge services

Charging information may be given for the original call and for the resulting CCNR call.

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

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

6.1.2 Charging information during the call (AOC-D)

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

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

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

6.2 Call hold (HOLD)

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

NOTES

1 When receiving a CCNR recall indication, user A may invoke the call hold supplementary service which may make interface resources available for the establishment of the CCNR call.

2 When user A is busy or CCNR busy and is notified that destination B is free, invocation of the call hold supplementary service will not result in the CCNR call being established.

6.3 Call transfer services

6.3.1 Normal Call Transfer (NCT)

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

6.3.2 Explicit Call Transfer (ECT)

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

6.4 Call Waiting (CW)

CCNR requests in the destination B CCNR queue shall only be processed if there are no calls waiting.

When a CCNR call arrives at destination B and if destination B is not busy, then the CCNR call may be presented via the call waiting supplementary service.

6.5 Closed User Group (CUG)

Closed user group information from the original call shall be stored by the network and shall be included in the CCNR call.

NOTE – Closed user group information is not included in the check for a compatible terminal. If a terminal performs an internal closed user group check and uses the closed user group information provided on a call to determine whether or not to inform the user of the incoming call, then such a terminal may react positively to the check for a compatible terminal due to the absence of closed user group information, but due to the internal closed user group check such a terminal may then not inform the user of the arrival of the resulting CCNR call.

6.6 Completion of calls services

6.6.1 Completion of Calls on No Reply (CCNR)

A user can be both a "user", and a "destination B" simultaneously, i.e. that user can have activated the CCNR supplementary service and have CCNR requests outstanding while at the same time that user can be the destination of CCNR requests from other users.

If a user receives a CCNR recall while that user's destination B CCNR queue is being processed, then the CCNR recall shall take priority over the handling of the destination B CCNR queue. The handling of CCNR requests activated by this user shall have priority over the handling of CCNR requests activated by other users on this user.

If one of the user's CCNR requests can be processed as a result, then the user shall be given a CCNR recall or notification as described in clause 3. The served user's destination B idle guard timer, if running, shall be cancelled.

6.6.2 Completion of Calls to Busy Subscriber (CCBS)

A user can be both a "user A" and a "destination B" simultaneously, i.e. that user can have activated the CCNR or completion of calls to busy subscriber supplementary service and have CCNR or completion of calls to busy subscriber requests outstanding whilst at the same time that user can be the destination of CCNR or completion of calls to busy subscriber requests from other users.

If a user receives a CCNR or completion of calls to busy subscriber recall while that user's destination B CCNR or completion of calls to busy subscriber queue is being processed, then the CCNR or completion of calls to busy subscriber recall shall take priority over the handling of the destination B CCNR or completion of calls to busy subscriber queue. The handling of CCNR/completion of calls to busy subscriber requests activated by this user shall have priority over the handling of CCNR or completion of calls to busy subscriber requests activated by other users on this user.

If one of the user's CCNR or completion of calls to busy subscriber requests can be processed as a result, then the user shall be given a CCNR or completion of calls to busy subscriber recall or notification as described in clause 3. The served user's destination B idle guard timer, if running, shall be cancelled.

The completion of calls to busy subscriber requests shall be processed before the CCNR requests.

If user A has a completion of calls to busy subscriber recall pending on arrival of the CCNR recall, this should be treated in the same way as in the case where user A is CCNR busy [see 3.2.3 and 3.3.3.2 b)].

6.7 Conference services

6.7.1 Conference calling (CONF)

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

6.7.2 Meet-Me Conference (MMC)

An attempt to activate the CCNR supplementary service on a call to a meet-me conference shall be rejected.

6.7.3 Preset Conference Calling (PCC)

Not applicable.

6.7.4 Three-Party Service (3PTY)

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

6.8 Diversion services

CCNR recalls shall not be diverted. They are given to user A at user A's original location.

6.8.1 Call Deflection (CD)

Assume user A calls destination B and destination B activates the call deflection supplementary service or has activated the call deflection supplementary service to user C. Using these assumptions the following situations may occur:

a) *Calling user (user A)*

If user A calls destination B and the call is deflected to user C and user C does not reply, then a request by user A to activate the CCNR supplementary service shall be applied to destination B.

b) *Called user (destination B)*

If destination B requests invocation of the call deflection supplementary service on a CCNR call, then the following actions shall result:

- if the request was made before the network receives an indication that the user is being informed of the call, then the request from destination B to deflect a CCNR call shall be rejected; or
- if the request was made after the network has received an indication that the user is being informed of the call, then the request from destination B to deflect a CCNR call shall be accepted. The CCNR call shall be deflected as a normal call. The corresponding CCNR request shall be deactivated.

6.8.2 Call Forwarding Busy (CFB)

Assume user A calls user B and user B activates the call forwarding busy supplementary service or has activated the call forwarding busy supplementary service to user C. Using these assumptions the following situations may occur:

a) The call forwarding busy supplementary service was activated by user B before user A requests the CCNR supplementary service on user B:

If user B has activated the call forwarding busy supplementary service and is busy, and the forwarded-to user C does not answer the call (no reply) then a request by user A to activate

the CCNR supplementary service shall be rejected. User A shall be informed that the CCNR request has been rejected with "short-term denial" as the reason.

b) The call forwarding busy supplementary service is activated by user B after user A has activated the CCNR supplementary service on user B:

If user B activates the call forwarding busy supplementary service after user A has activated the CCNR supplementary service on user B, the CCNR call shall be forwarded as a normal call to user C. The corresponding CCNR request shall be deactivated.

6.8.3 Call Forwarding No Reply (CFNR)

Assume user A calls user B and user B activates the call forwarding no reply supplementary service or has activated the call forwarding no reply supplementary service to user C. Using these assumptions the following situations may occur:

a) The call forwarding no reply supplementary service was activated by user B before user A requests the CCNR supplementary service on user B:

If user A calls user B and the call is forwarded on no reply to user C and user C does not answer the call (no reply), a request by user A to activate the CCNR supplementary service shall apply to the originally called user B.

b) Arrival of the CCNR call after the call forwarding on no reply supplementary service has been activated:

If user B has activated the call forwarding on no reply supplementary service and does not answer the call (no reply) upon the arrival of the CCNR call, then according to a network option, the call shall be treated as follows:

- the procedures of the CCNR supplementary service shall apply [see 3.3.3.1 c)]; or
- the call shall be forwarded as a normal call. The corresponding CCNR request shall be deactivated.

6.8.4 Call Forwarding Unconditional (CFU)

Assume user A calls user B and user B activates the call forwarding unconditional supplementary service (or has activated the call forwarding unconditional supplementary service) to user C. Using these assumptions the following situations may occur:

a) The call forwarding unconditional supplementary service was activated by user B before user A requests the CCNR supplementary service on user B:

If the call to user B is forwarded to user C by the call forwarding unconditional supplementary service and user C does not answer the call (no reply), then a request by user A to activate the CCNR supplementary service shall be rejected. User A shall be informed that the CCNR request has been rejected with "short-term denial" as the reason.

b) The call forwarding unconditional supplementary service is activated by user B after user A has activated the CCNR supplementary service on user B:

If user B activates the call forwarding unconditional supplementary service after user A has activated the CCNR supplementary service, then outstanding queued CCNR requests shall remain in the user B CCNR request queue until the CCNR service duration timer expires. If user B deactivates the call forwarding unconditional supplementary service before the expiry of the CCNR service duration timer and subsequently becomes free after having terminated an activity, the outstanding CCNR requests shall be processed again.

If user B activates the call forwarding unconditional supplementary service between the expiry of the user B idle guard timer and the arrival of the CCNR call, the CCNR call shall be forwarded as a normal call. The corresponding CCNR request shall be deactivated.

6.8.5 Selective Call Forwarding (SCF)

When the selective call forwarding supplementary service has been activated unconditionally and if an incoming call matches the selection conditions, then the interaction described in 6.8.1 applies.

When the selective call forwarding supplementary service has been activated on busy and if an incoming call matches the selection conditions, then the interaction described in section 6.8.2 applies.

When the selective call forwarding supplementary service has been activated on no reply and if an incoming call matches the selection conditions, then the interaction described in section 6.8.3 applies.

6.9 Direct-Dialling-In (DDI)

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

6.10 In-call modification (IM)

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

6.11 ISDN Freephone Service (IFS)

A request for the CCNR supplementary service on a call to a freephone number shall be rejected.

Freephone calls shall take precedence over CCNR requests.

6.12 Line Hunting (LH)

The CCNR supplementary service cannot be activated against a line hunting group.

NOTE – The CCNR supplementary service can be activated against an individual number in a line hunting group.

6.13 Malicious Call Identification (MCID)

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

6.14 Multi-Level Precedence and Preemption (MLPP)

The precedence level of calls is retained along with other call information. The network assists the user to establish the connection at the same precedence level.

CCNR requests for MLPP calls are queued and processed on a first in, first out basis with no preference given for the precedence level of the call.

If destination B terminates the existing call and starts a new call, the network compares the precedence of the new call with that of the CCNR call. If the new call is of lower precedence, a CCNR recall is provided to user C. If the CCNR recall is accepted by user C, the new call is preempted and the CCNR call is connected. This is also true for calls which are originating prior to the expiry of the idle guard timer. The CCNR recall should include an indication that destination B is busy with a call of lower precedence.

6.15 Multiple Subscriber Number (MSN)

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

NOTE – The limit of entries in the destination B CCNR queue applies per multiple subscriber number. Entries are processed in the order that they are received for the whole access. The service provider may limit the maximum number of entries in the combined destination B CCNR queue for the access.

6.16 Name identification services

6.16.1 Calling Name identification Presentation (CNIP)

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

NOTE – If user A accepts a CCNR recall, the resulting call is a normal call and destination B can receive calling name identification presentation.

6.16.2 Calling Name Identification Restriction (CNIR)

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

6.17 Number identification services

6.17.1 Calling Line Identification Presentation (CLIP)

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

NOTE – If user A accepts a CCNR recall, the resulting call is a normal call and destination B can receive calling line identification presentation.

6.17.2 Calling Line Identification Restriction (CLIR)

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

NOTE – If user A has calling line identification restriction and user A accepts a CCNR recall, then the resulting call is a normal call and destination B will not receive the calling line identification of user A.

6.17.3 Connected Line Identification Presentation (COLP)

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

6.17.4 Connected Line Identification Restriction (COLR)

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

6.18 Outgoing Call Barring (OCB)

When the outgoing call barring supplementary service is activated after the served user activates the CCNR supplementary service, the CCNR call shall be barred according to the barring program which is active at the served user's access or ISDN number, and the associated basic service for the call.

When the CCNR call is barred, the corresponding CCNR request shall be deactivated.

6.19 Reverse charging (REV)

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

6.20 Sub-addressing (SUB)

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

NOTE – User A's sub-address (if any) which was supplied in the original call request can be included when notifying or recalling the calling user.

6.21 Support of Private Numbering Plan (SPNP)

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

6.22 Terminal Portability (TP)

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

NOTE – In the case of disconnected terminals, a CCNR recall will be treated as not accepted upon expiry of the CCNR recall timer.

6.23 User-to-User Signalling (UUS)

The network shall not store any information related to the user-to-user signalling supplementary service provided by user A in the original call.

User A can request the activation of user-to-user signalling supplementary service and provide the user-to-user information, as required, when accepting the CCNR recall. If the resulting CCNR call contains information related to the user-to-user signalling supplementary service, this shall be handled as for the normal operation of the user-to-user signalling supplementary service.

7 SDL description

See Figure 1.

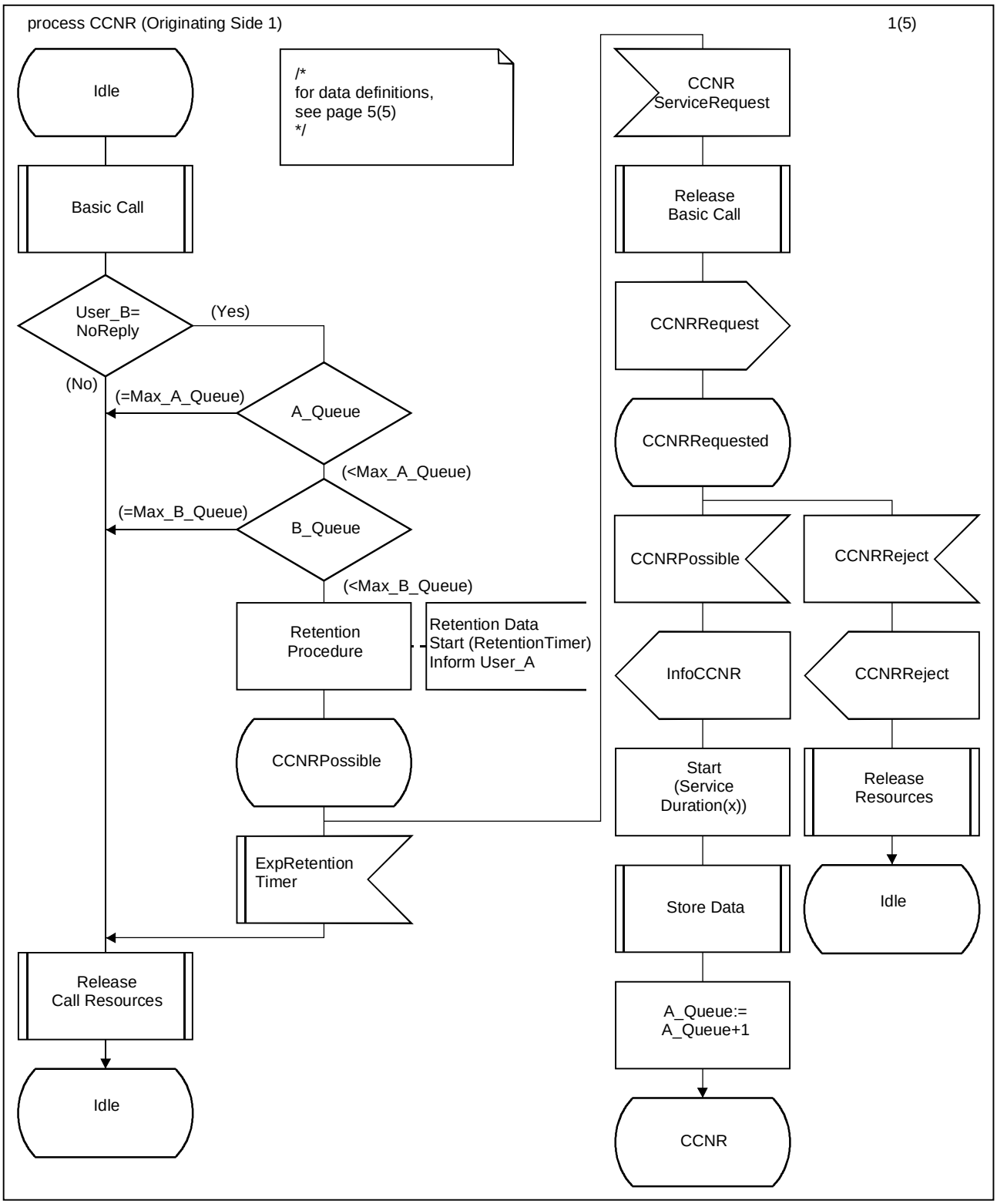

FIGURE 1/I.253.4 (sheet 1 of 5)

CCNR SDL description

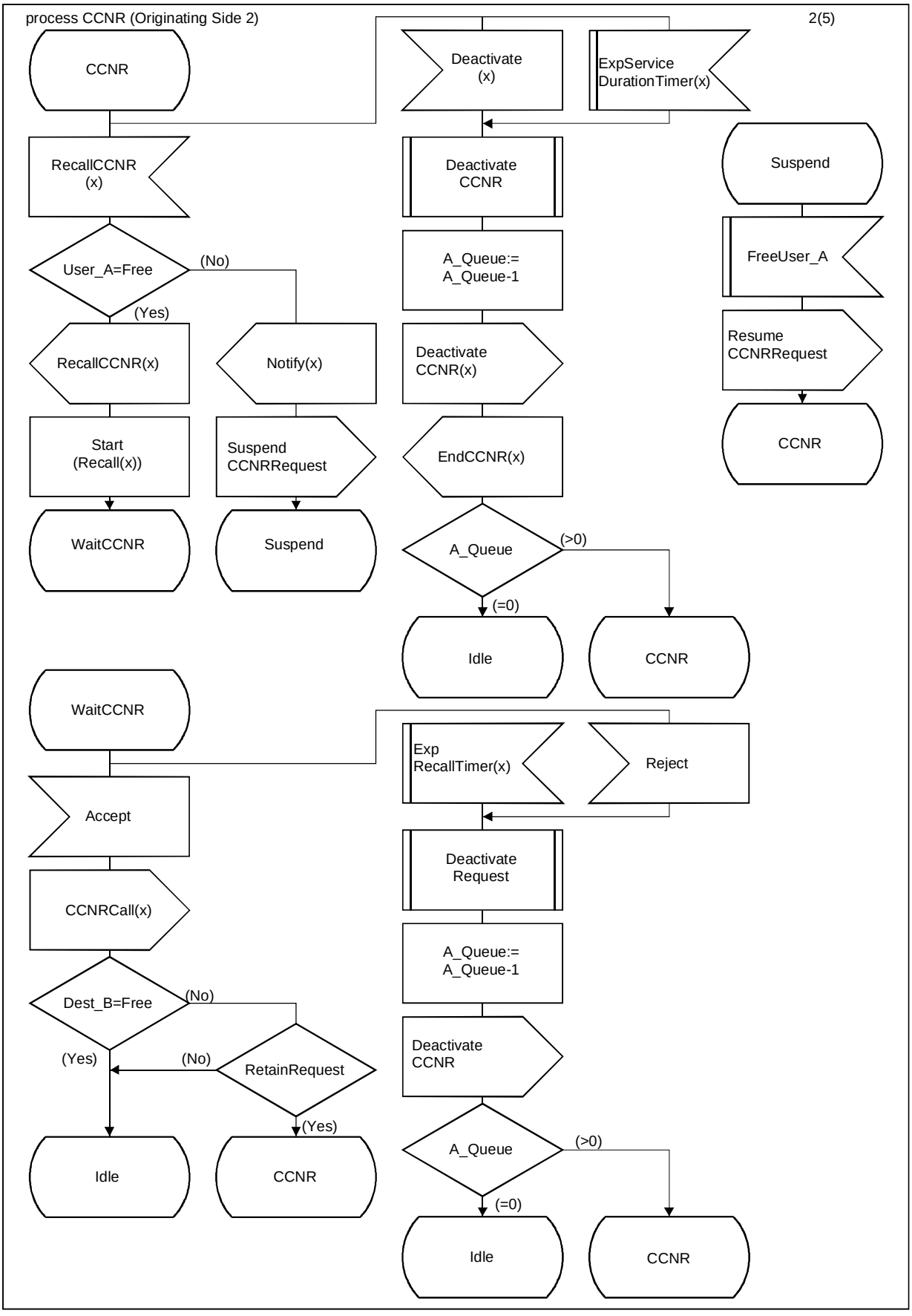

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FIGURE 1/I.253.4 (sheet 2 of 5)

CCNR SDL description

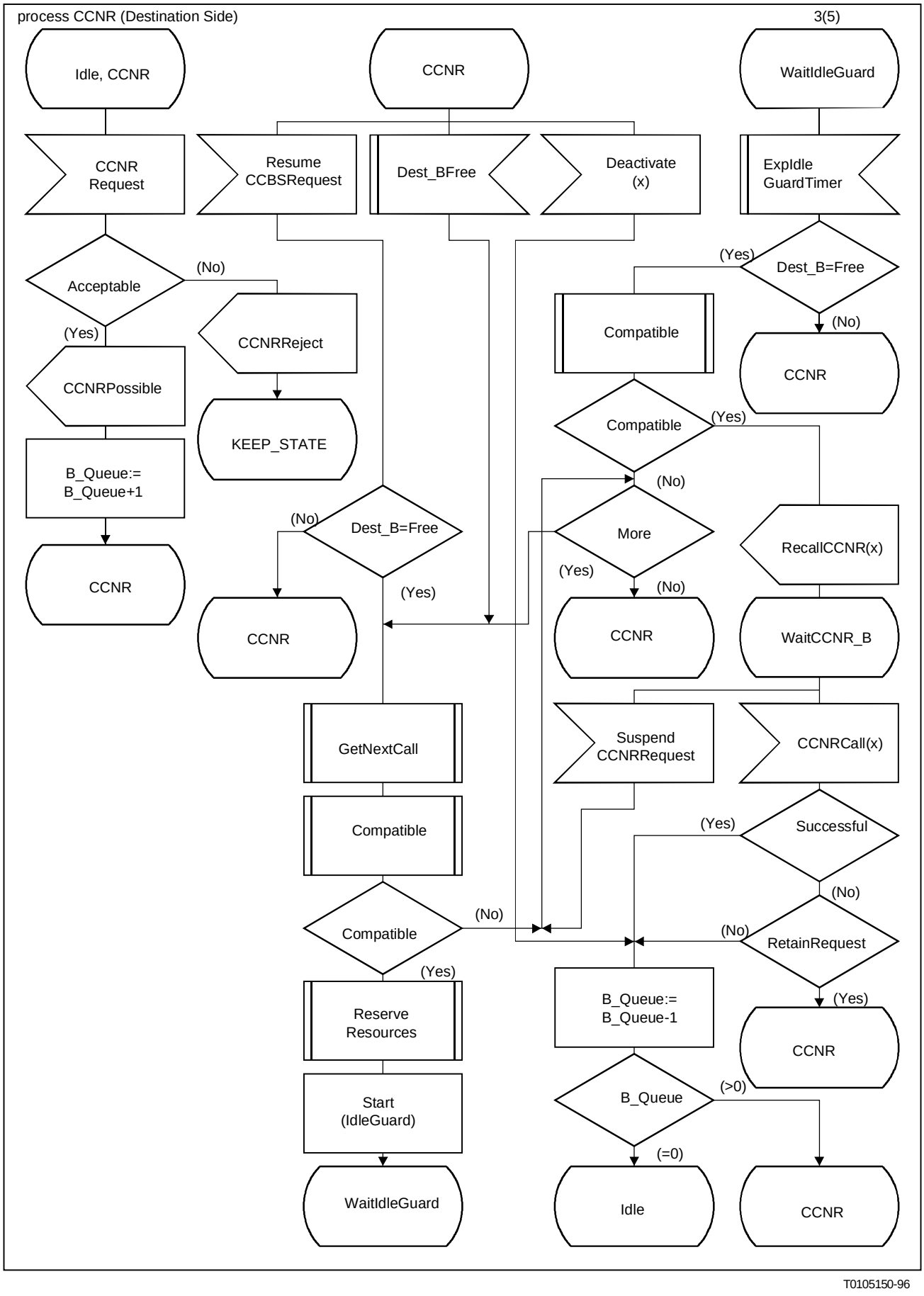

FIGURE 1/I.253.4 (sheet 3 of 5)

CCNR SDL description

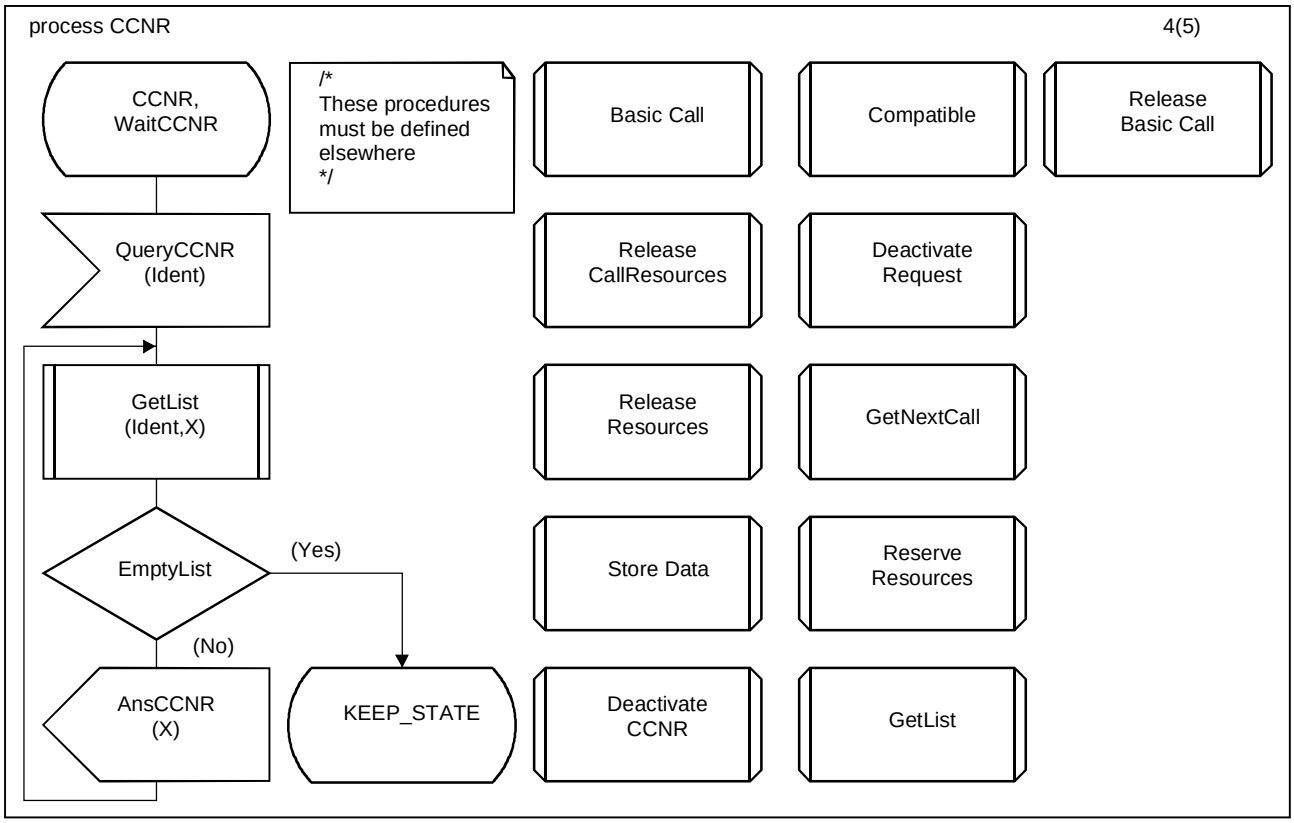

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FIGURE 1/I.253.4 (sheet 4 of 5)

CCNR SDL description

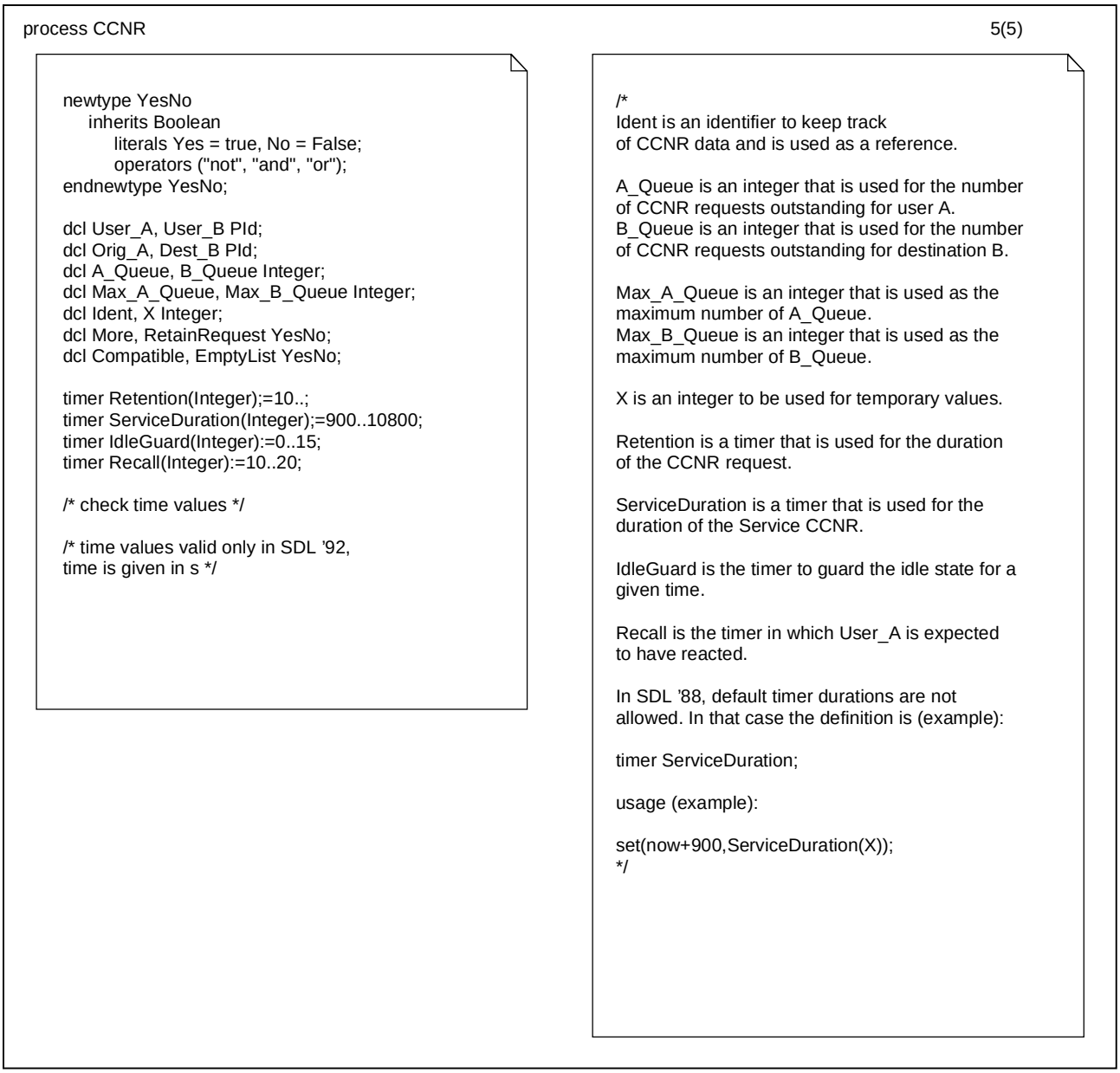

FIGURE 1/I.253.4 (sheet 5 of 5)

CCNR SDL description

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