Source:	**CT3**
Title:	**CR to Rel-6 related to Call Hold on Work Item "IMS"**
Agenda item:	**9.12**
Document for:	**APPROVAL**

Introduction:

This document contains 1 CR to Rel-6 on Work Item "IMS-CCR-IWCS" that have been agreed by TSG CT WG3, and are forwarded to TSG CT Plenary for approval.

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver	Work Item
C3-050379	29.163	064	1	F	Call Hold corrections	Rel-6	6.6.0	IMS-CCR-IWCS

3GPP TSG-CT WG3 Meeting #36
Cancun, Mexico. 25th - 29th April 2005.

Tdoc ⌘ *C3-050379*

CR-Form-v7.1

CHANGE REQUEST

⌘	**29.163** CR **064**	⌘**rev**	**1**	⌘	Current version:	**6.6.0**	⌘

For **HELP** *on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	Call Hold corrections	
Source: ⌘	Lucent Technologies	
Work item code:⌘	IMS-CCR-IWCS	*Date:* ⌘ 18/04/2005

Category: ⌘ **F**

Use <u>one</u> of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Release: ⌘ Rel-6

Use <u>one</u> of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change: ⌘	Inconsistencies exist in the specification of Call Hold for both the Control Plane and the Mn Signalling interactions. In addition, the current specification does not account for the possibility of dual call hold.
Summary of change:⌘	The Control Plane call hold sections have been modified to also include the use of re-INVITEs to initiate the resulting SIP SDP offers instead of just UPDATE. The use of re-INVITE is the preferred method to be used according to RFC 3311 and ITU-T Q.1912.5. The Control Plane sections have also be modified to accommodate the situation where dual hold may occur. Dual hold is the condition in which the second party of the call also places the call on hold after the first party invoked a call hold. This situation will result in different media mode settings in the SIP SDP offer/answer. The corresponding changes have also been made to the Mn signalling specification.
Consequences if *not approved:* ⌘	The specification is incorrect and incomplete. Possible call hold service invocations are not addressed which may result in interoperability issues.

Clauses affected: ⌘	7.4.10.1, 7.4.10.2, 9.2.9, and 9.2.10

	Y	N		
Other specs ⌘		X	Other core specifications	⌘
affected:		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<div style="border:1px solid">

First Change

</div>

7.4.10.1   Session hold initiated from the IM CN subsystem side

~~A SIP UE~~The IMS network makes a hold request by sending an UPDATE ~~(~~or re-INVITE~~)~~ message with an "inactive" or a "sendonly" SDP attribute (refer to RFC 3264 [36]), depending on the current state of the session. Upon receipt of the hold~~/resume~~ request from the IMS side, the MGCF shall send a CPG message to the CS side with a '*remote hold'*~~/ 'remote retrieval'~~ *Generic notification indicator*. To resume the session, the IMS side sends an UPDATE or re-INVITE message with a "recvonly" or "sendrecv" SDP attribute, depending on the current state of the session. Upon receipt of the resume request from the IMS side, the MGCF shall send a CPG message to the CS side with a '*remote retrieval' Generic notification indicator.* The user plane interworking of the hold/resume request is described in the clause 9.2.9.
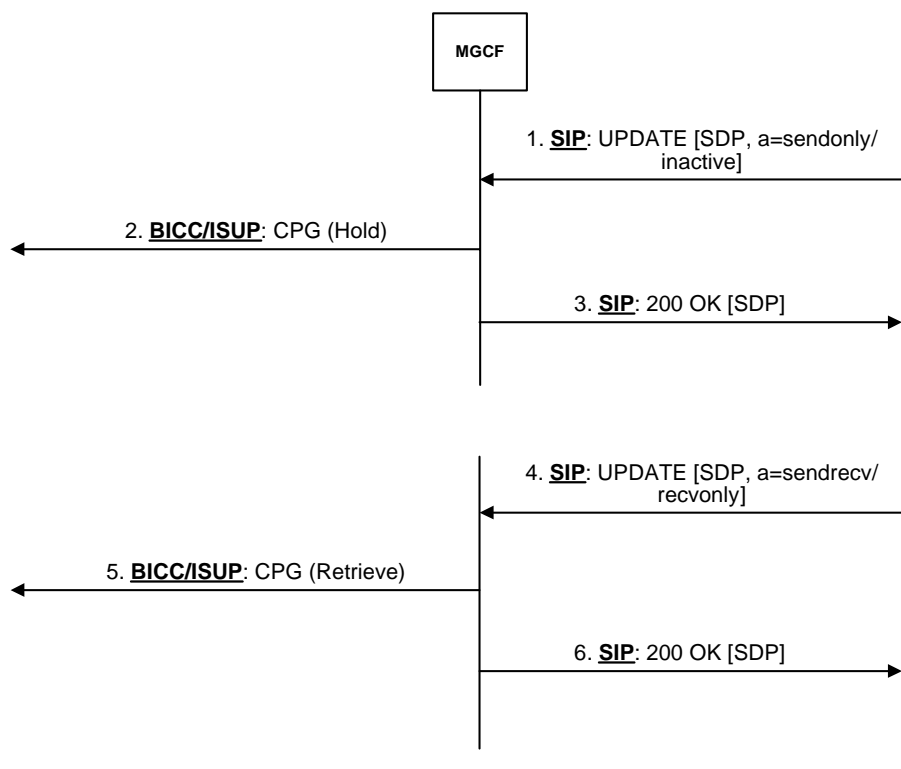
MGCF

1. **SIP**: UPDATE [SDP, a=sendonly/ inactive]

2. **BICC/ISUP**: CPG (Hold)

3. **SIP**: 200 OK [SDP]

4. **SIP**: UPDATE [SDP, a=sendrecv/ recvonly]

5. **BICC/ISUP**: CPG (Retrieve)

6. **SIP**: 200 OK [SDP]

Figure 30a Session hold/resume initiated from the IM CN subsystem side

7.4.10.2   Session hold initiated from the CS network side

When an MGCF receives a CPG message with a '*remote hold*' Generic notification indicator, the MGCF shall forward the hold request by sending an UPDATE or re-INVITE message containing SDP with "*sendonly*" or "inactive" media.

When an MGCF receives a CPG message with a '*remote retrieval*' Generic notification indicator, the MGCF shall forward the resume request by sending an UPDATE or re-INVITE message containing SDP with "*sendrecv*" or "recvonly" media.

If the MGCF receives a CPG with '*remote hold*' or '*remote retrieval*' before answer, it shall forward the request using an UPDATE message. If the MGCF receives a CPG with '*remote hold*' or '*remote retrieval*' after answer, it should forward the request using re-INVITE but may use UPDATE.

If link aliveness information is required at the IM-MGW while the media are on hold, the O-MGCF should provide modified SDP RR and RS bandwidth modifiers specified in IETF RFC 3556 [59] within the UPDATE or re-INVITE messages holding and retrieving the media to temporarily enable RTCP while the media are on hold, as detailed in

Clause 7.4 of 3GPP TS 26.236 [32]. If no link aliveness information is required at the IM-MGW, the O-MGCF should provide the SDP RR and RS bandwidth modifiers previously used.

The interworking does not impact the user plane, unless the MGCF provides modified SDP RR and RS bandwidth modifiers within the UPDATE or re-INVITE messages. If the MGCF provides modified SDP RR and RS bandwidth modifiers to the ~~UE~~IMS side, the MGCF shall also provide modified SDP RR and RS bandwidths to the IM-MGW, as described in the clause 9.2.10.
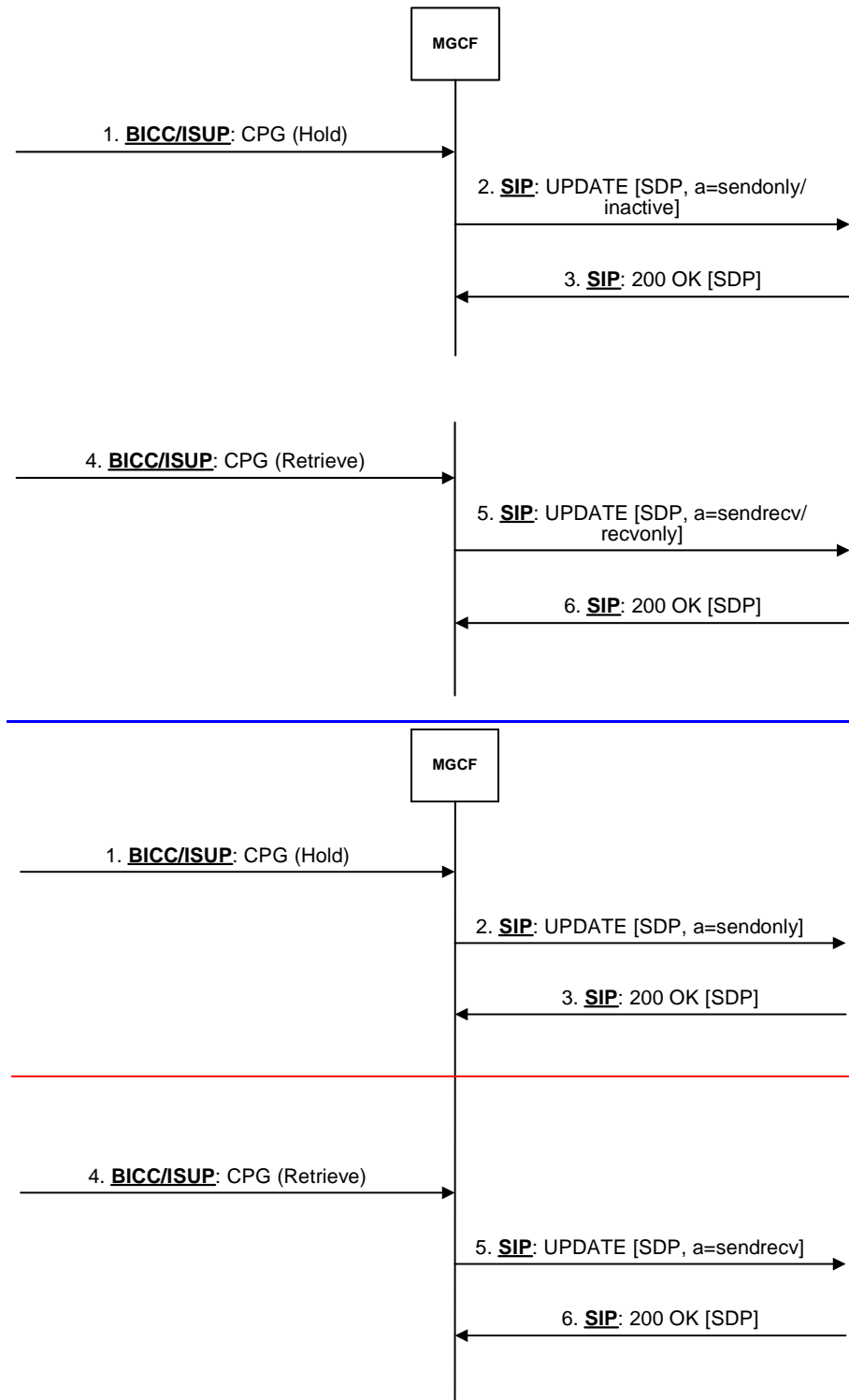

Figure ~~30a~~ 30b Session hold/resume initiated from the CS network side

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Second Change

9.2.9 Session hold initiated from IM CN subsystem

The network model in the clause 9.2.1 shall apply here.

Hold request

When ~~a SIP Ue~~the IMS network makes a hold request by sending an UPDATE ~~(~~or re-INVITE~~)~~ message (signal 1 of figure 50), the MGCF shall request the IM-MGW to suspend sending media towards the ~~SIP UE~~IMS side by changing the through-connection of the IM CN subsystem side termination to 'not through-connected' (signal 2 of figure 50). If the ~~UE~~ IMS side provides modified SDP RR or RS bandwidth modifiers, as specified in IETF RFC 3556 [59], within the hold request, the MGCF shall use the Configure IMS Resources Mn procedure to forward this information to the IM-MGW (not depicted in figure 50, but may be combined with signal 2). The MGCF shall send a CPG (Hold) message to the succeeding CS network node to indic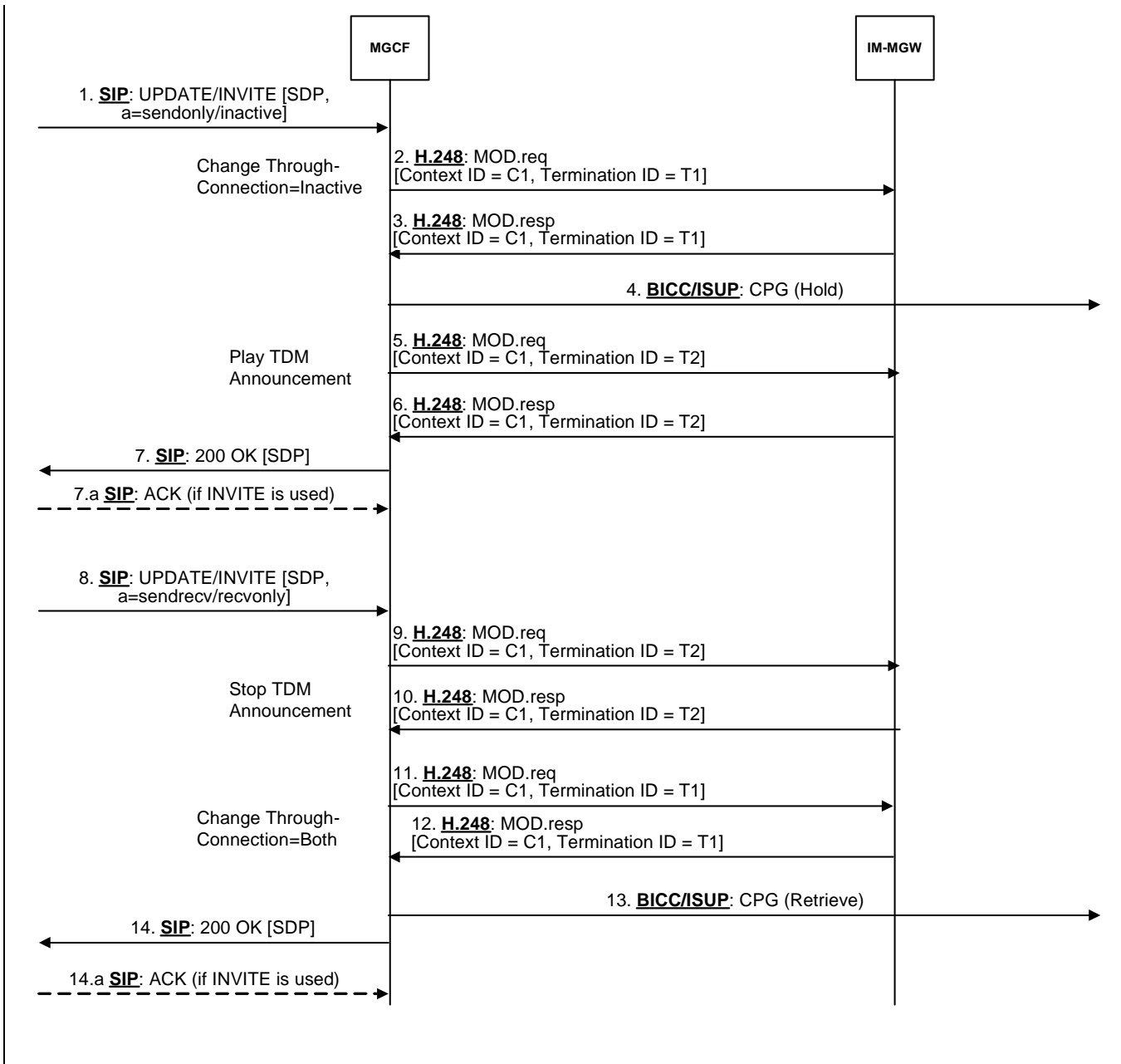ate that the session is on hold (signal 4 of figure 50). Simultaneously a SIP message acknowledging the Hold request is sent to the ~~SIP UE~~IMS side (signal 7 of figure 50, acknowledged by signal 7.a if the INVITE method is used). Announcements may be applied to the party on hold, depending on the held party's status, using the Play Announcement procedure (for BICC) or the Play TDM Announcement procedure (for ISUP, signal 5 in figure 50). The hold operation shall not block RTCP flows.

Resume request

When the ~~SIP UE~~IMS network makes a request to retrieve the session on hold by sending an UPDATE ~~(~~or re-INVITE~~)~~ message (signal 8 of figure 50), the MGCF shall request the IM-MGW to re-establish communication towards the IMS network by changing the through-connection of the IM CN subsystem side termination to both-way through-connected (signal 11 of figure 50). If the ~~UE~~ IMS side provides modified SDP RR or RS bandwidth modifiers, as specified in IETF RFC 3556 [59], within the retrieve request, the MGCF shall use the Configure IMS Resources Mn procedure to forward this information to the IM-MGW (not depicted in figure 50, but may be combined with signal 11). Possible announcements to the party on hold shall be stopped using the Stop Announcement procedure (for BICC) or the Stop TDM Announcement procedure (for ISUP, signal 9 in figure 50). The MGCF shall send a CPG (Retrieve) message to the succeeding CS network node to indicate that the session is retrieved (signal 13 of figure 50).

Message sequence chart

Figure 50 shows the message sequence chart for the call hold and retrieval procedures.

MGCF

IM-MGW

1. **SIP**: UPDATE/INVITE [SDP, a=sendonly/inactive]

Change Through-
Connection=Inactive

2. **H.248**: MOD.req
[Context ID = C1, Termination ID = T1]

3. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T1]

4. **BICC/ISUP**: CPG (Hold)

Play TDM
Announcement

5. **H.248**: MOD.req
[Context ID = C1, Termination ID = T2]

6. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T2]

7. **SIP**: 200 OK [SDP]

7.a **SIP**: ACK (if INVITE is used)

8. **SIP**: UPDATE/INVITE [SDP, a=sendrecv/recvonly]

9. **H.248**: MOD.req
[Context ID = C1, Termination ID = T2]

Stop TDM
Announcement

10. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T2]

11. **H.248**: MOD.req
[Context ID = C1, Termination ID = T1]

Change Through-
Connection=Both

12. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T1]

13. **BICC/ISUP**: CPG (Retrieve)

14. **SIP**: 200 OK [SDP]

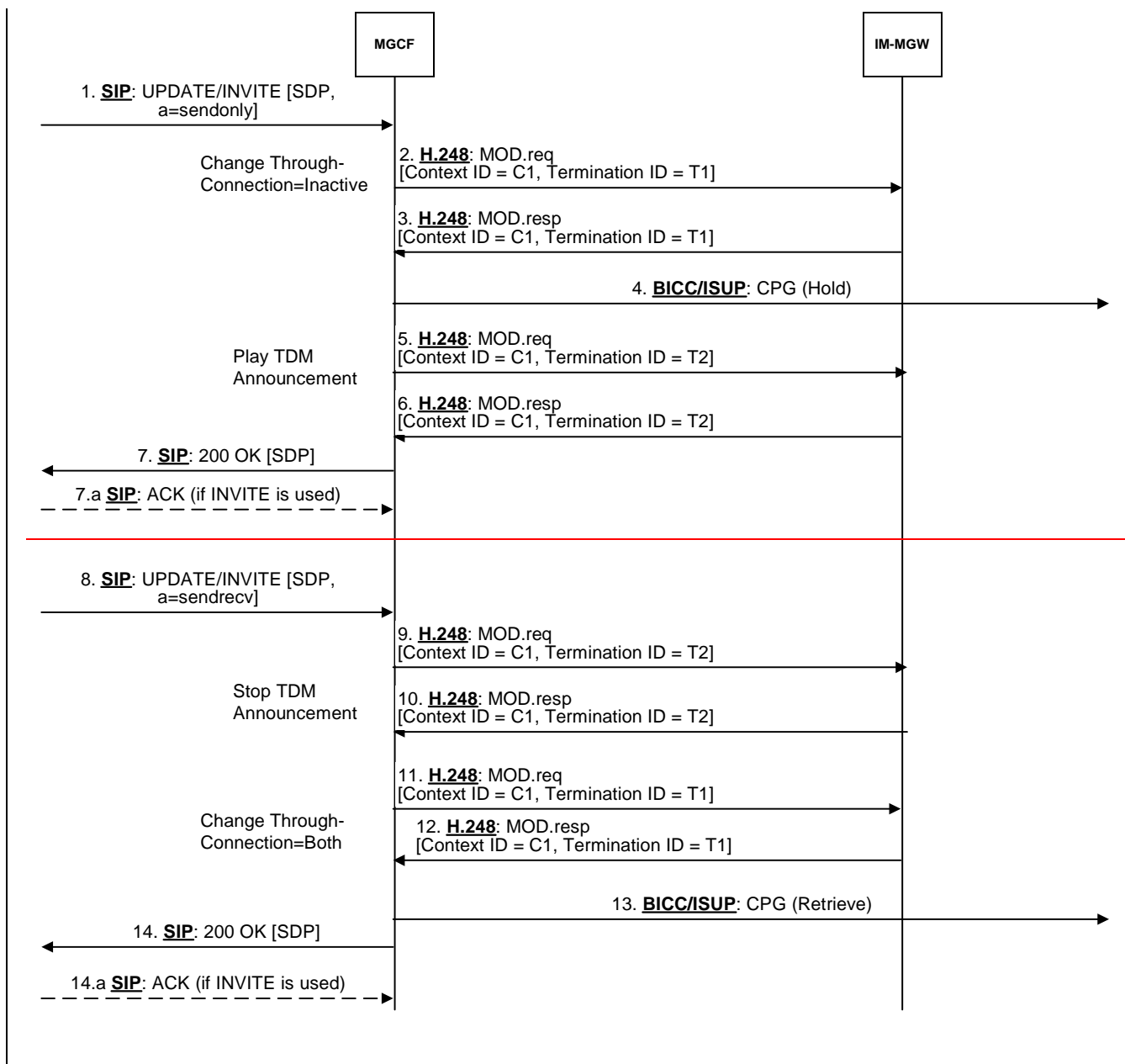14.a **SIP**: ACK (if INVITE is used)

Figure 50 Session hold from IM CN subsystem

9.2.10 Session hold initiated from CS network

When an MGCF receives a CPG message with a '*remote hold*' Generic notification indicator (signal 1 of figure 51), the MGCF forwards the hold request by sending an UPDATE or re-INVITE message containing SDP with "*sendonly*" or "*inactive*" media (signal 4 of figure 51).

When an MGCF receives a CPG message with a '*remote retrieval*' Generic notification indicator (signal 6 of figure 51), the MGCF forwards the resume request by sending an UPDATE or re-INVITE message containing SDP with "*sendrecv*" or "*recvonly*" media (signal 9 of figure 51).

If the MGCF receives a CPG with '*remote hold*' or '*remote retrieval*' before answer, it shall forward the request using an UPDATE message. If the MGCF receives a CPG with '*remote hold*' or '*remote retrieval*' after answer, it should forward the request using re-INVITE but may use UPDATE.

If link aliveness information is required at the IM-MGW while the media are on hold, the O-MGCF should provide to the modified SDP RR and RS bandwidth modifiers specified in IETF RFC 3556 [59] within the SDP offers in the UPDATE or re-INVITE messages holding and retrieving the media to temporarily enable RTCP while the media are on

hold, as detailed in Clause 7.4 of 3GPP TS 26.236 [32]. If no link aliveness information is required at the IM-MGW, the ~~O~~ MGCF should provide the SDP RR and RS bandwidth modifiers previously used.

The interworking does not impact the user plane, unless the MGCF provides modified SDP RR and RS bandwidth modifiers in the UPDATE or re-INVITE messages. If the MGCF provides modified SDP RR and RS bandwidth modifiers in the UPDATE or re-INVITE messages, the MGCF shall also provide modified SDP RR and RS bandwidths to the IM-MGW using the Configure IMS Resoureces procedures (signals 2-3 and 7-8 of figure 51).

Message sequence chart

Figure 51 shows the message sequence chart for the call hold and retrieval procedures.

MGCF

IM-MGW

1. **BICC/ISUP**: CPG (Hold)

Configure IMS
Resources
(optional)

2. **H.248**: MOD.req
[Context ID = C1, Termination ID = T1]

3. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T1]

4. **SIP**: UPDATE/INVITE [SDP, a=sendonly/inactive]

5. **SIP**: 200 OK [SDP]

5.a **SIP**: ACK (if INVITE is used)

6. **BICC/ISUP**: CPG (Retrieve)

Configure IMS
Resources
(optional)

7. **H.248**: MOD.req
[Context ID = C1, Termination ID = T1]

8. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T1]

9. **SIP**: UPDATE/INVITE [SDP, a=sendrecv/recvonly]

10. **SIP**: 200 OK [SDP]

10.a **SIP**: ACK (if INVITE is used)

MGCF

IM-MGW

1. **BICC/ISUP**: CPG (Hold)

Configure IMS
Resources
(optional)

2. **H.248**: MOD.req
[Context ID = C1, Termination ID = T1]

3. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T1]

4. **SIP**: UPDATE [SDP, a=sendonly]

5. **SIP**: 200 OK [SDP]

6. **BICC/ISUP**: CPG (Retrieve)

Configure IMS
Resources
(optional)

7. **H.248**: MOD.req
[Context ID = C1, Termination ID = T1]

8. **H.248**: MOD.resp
[Context ID = C1, Termination ID = T1]
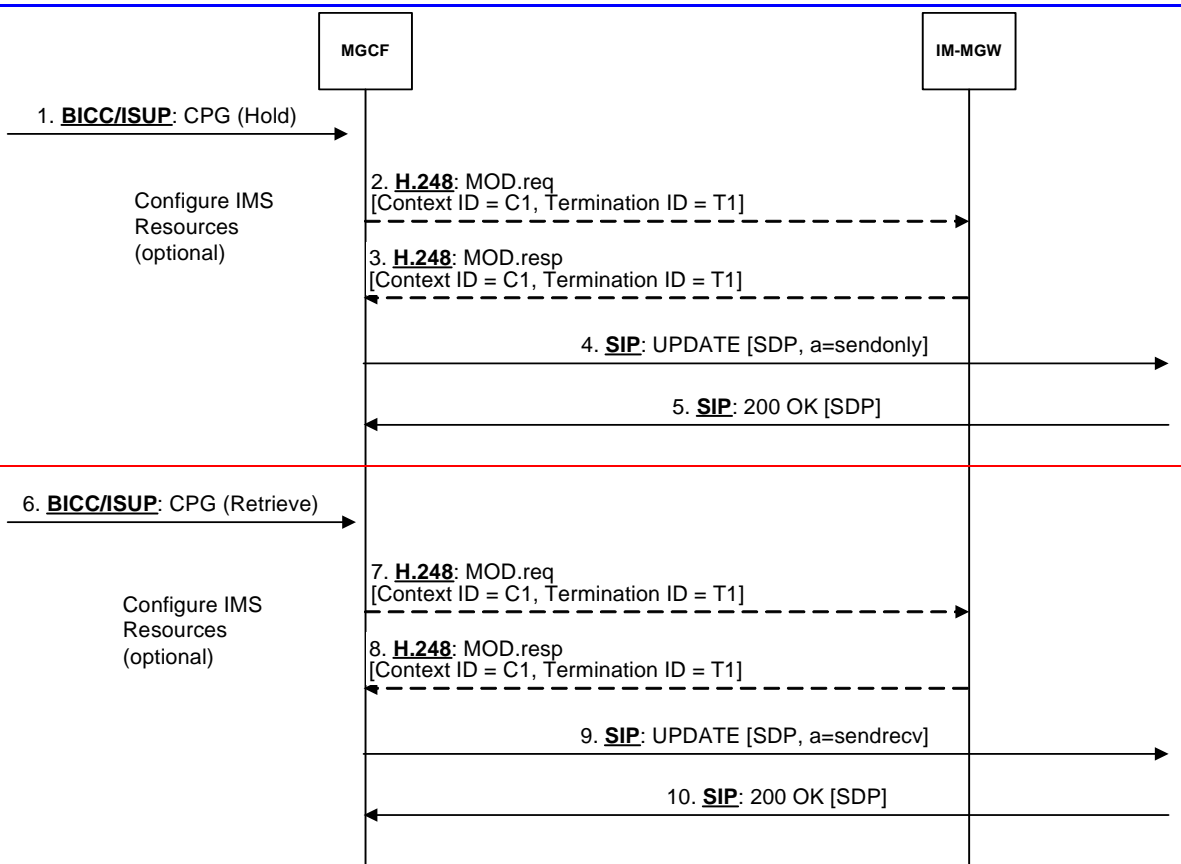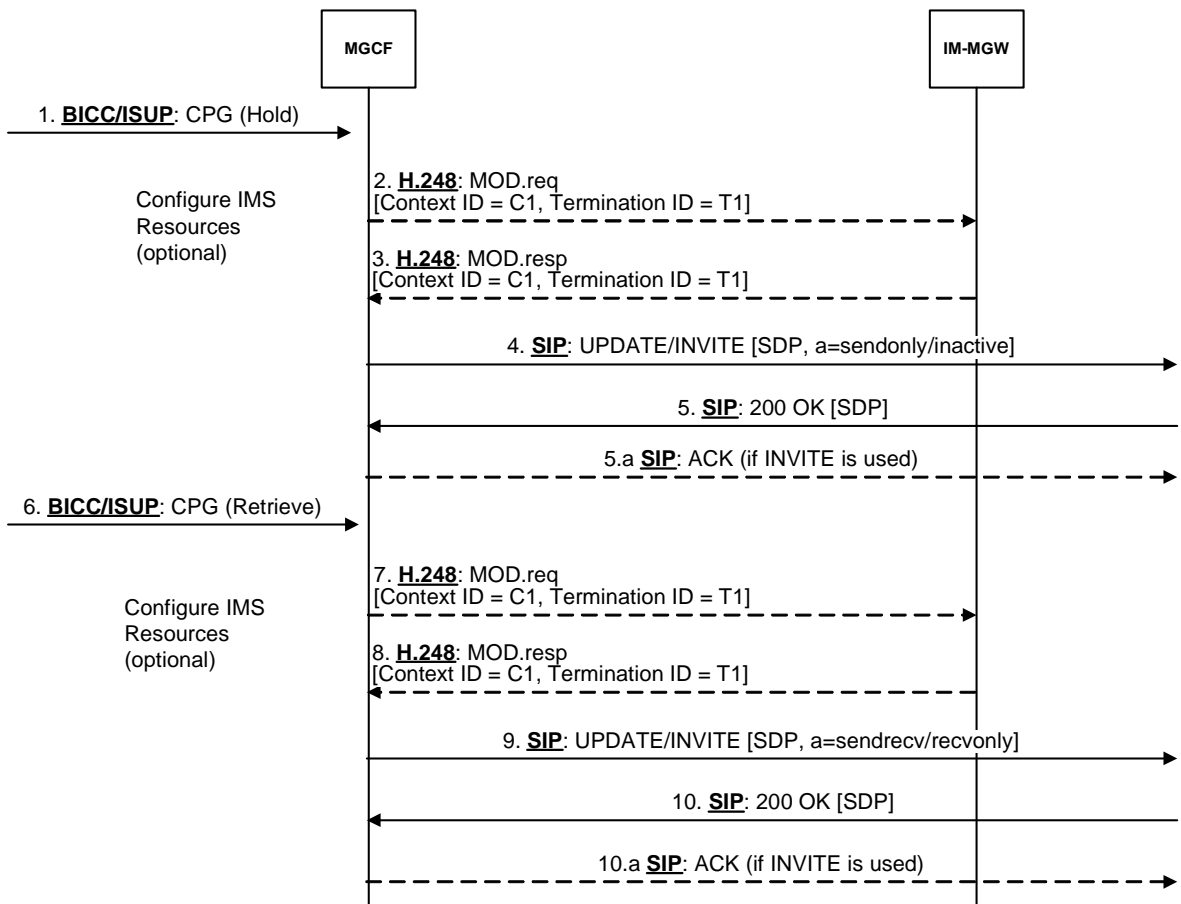
9. **SIP**: UPDATE [SDP, a=sendrecv]

10. **SIP**: 200 OK [SDP]

3GPP

Figure 51 Session hold from CS network