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ISDN User Part (ISUP) version 2
of the national Signalling System No. 7
Interworking Specification

SUOSITUS



**TELEHALLINTOKESKUS
1996****Contents:**

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1. Scope

This recommendation specifies the interworking between ISDN User Part ISUP Version 2 of the national Signalling System No. 7 (ISUP2) and R2-PABX, TUP1, TUP2, ISUP1, 2B+D, 30B+D.

These interworkings take place in the exchanges of the national network. This recommendation covers the interworkings in case of basic calls and in case when the ISDN supplementary services /4/ or the national subscriber services /8/ are used.

2. References

- /1/ prETS 300343: Integrated Services Digital Network (ISDN); Signalling interworking specification for ISDN User Part (ISUP) version 1. May 1993.
- /2/ prETS 300303: Integrated Services Digital Network (ISDN); ISDN - Global System for Mobile communications (GSM) Public Land Mobile Network (PLMN) signalling interface. May 1993.
- /3/ SFS 5779 ed 2: Signalling in the public switched telephone network (PSTN). ISDN User Part ISUP Version 2 of the national Signalling System No. 7. Application of ITU-T recommendations Q.761 - Q.764 and Q.766 in Finland. 1996
- /4/ SFS 5778: Signalling in the public switched telephone network (PSTN). ISDN User Part ISUP Version 2 of the national Signalling System No. 7. Supplementary Services. 1994
- /5/ SFS 5689: Signalling in the telecommunications network. ISDN User Part ISUP of the national Signalling System No. 7. Application of CCITT recommendations Q.761 - Q.764 and Q.766 in Finland. 1991
- /6/ Kansallinen yhteiskanavamerkinantojärjestelmä, puhelinkäyttäjäosa TUP 1993.
- /7/ Kansallinen yhteiskanavamerkinantojärjestelmä, puhelinkäyttäjäosa TUP, PTL&PL 1988.
- /8/ Kansalliset tilaajatoiminteet, Tele & PL 1992.
- /9/ SFS 5710:Televerkon päätelaitteet.Vaihteen digitaalisen keskusjohdon R2-merkinanto. 1991.
- /10/ GFI 9301: Guidelines for implementation. ISDN Access signalling. Basic call control procedures.
- /11/ GFI 9302, draft 7.10.1993: Guidelines for implementation. ISDN Supplementary services. Functional protocol.
- /12/ GFI 9303, draft 7.10.1993: Guidelines for implementation. ISDN Supplementary services. Keypad protocol.
- /13/ SFS 5749 ed. 2: Yleisen puhelinverkon merkinanto. Puhelun epäonnistumiseen liittyvän syyninformaation käsittely. 1996.
- /14/ prETS 300360: Integrated Services Digital Network (ISDN); Signalling interworking specification for ISDN User Part (ISUP) version 2. December 1993.
- /15/ ~~ETR164~~: Interaction between INAP and ISUP.

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3. Symbols, abbreviations and clarification of the terms

3.1 Symbols and abbreviations

ACB	ACcess Barred signal (TUP)
ACM	Address Complete Message (TUP, ISUP)
ADI	Address Incomplete signal (TUP)
ANM	ANswer Message (ISUP)
ANU	ANswer signal, Unqualified (TUP)
AOC	Advice Of Charge
CBK	Clear-BacK signal (TUP)
CCBS	Completion of Calls to Busy Subscriber
CD	Call Deflection
CFB	Call Forwarding Busy
CFL	Call FaiLure message (TUP)
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CGB	Circuit Group Blocking message (ISUP)
CGC	Circuit Group Congestion signal (TUP)
CH	Call Hold
CLF	Clear-Forward signal (TUP)
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CON	CONnect message (ISUP)
CON	CONgestion signal (TUP)
CONF	CONFerence calling
CPG	Call ProGress message (ISUP)
CUG	Closed User Group
CW	Call Waiting
DPN	Digital path not provided signal (TUP)
DRM	Diversion request (TUP)
ECT	Explicit Call Transfer
EUM	Extended-Unsuccessful-backward set-up information Message (TUP)
FAA	FAcility Accepted (ISUP)
FAC	FACility (ISUP)
FAR	FACility Request (ISUP)
FRJ	Facility ReJect (ISUP)
FRL	Forced ReLease (TUP)
GRQ	General ReQuest (TUP)
GRS	circuit Group ReSet message (TUP, ISUP)
GSM	General forward Set-up information Message (TUP)
GSM	Global System for Mobile communications
HGB	Hardware failure oriented Group Blocking message (TUP)
IAI	Initial Address message with additional Information (TUP)
IAM	Initial Address Message (ISUP)
ISUP	ISdn User Part
ISUP1	ISdn User Part, version 1 (See reference /5/)
ISUP2	ISdn User Part, version 2 (See reference /3/)
LOS	Line Out of Service (TUP)
MCID	Malicious Call IDentification
RES	RESume message (ISUP)

RSC	ReSet Circuit message (TUP, ISUP)
SEC	Switching Equipment Congestion signal (TUP)
SSB	SubScriber Busy signal (TUP)
SST	Send Special information Tone signal (TUP)
SUB	SUBaddressing
SUS	SUSpend message (ISUP)
TMR	Transmission Medium Requirement (ISUP)
TOR	Trunk Offering Release (TUP)
TOS	Trunk Offering Start (TUP)
TP	Terminal Portability
TUP	Telephone User Part
TUP1	Telephone User Part, Version 1 (See reference /7/)
TUP2	Telephone User Part, Version 2 (See reference /6/)
UNN	Unallocated National Number (TUP)
USI	User Service Information (ISUP)
USR	USeR-to-user information (ISUP)
UUI	User-to-User Information (ISUP)
UUS	User-to-User Signalling
UUS 1	UUS Service 1
UUS 2	UUS Service 2
UUS 3	UUS Service 3
3PTY	three ParTY service
MS	Mobile Subscriber

3.2 Clarification of the terms

No impact	No impact means, that the function or service is possible, but it has no influence on the interworking point. No information concerning the function or service is available or is transferred in the interworking point.
Not applicable	Not applicable means, that the function or service is not possible in the interworking case.

4. General considerations

4.1. Working assumptions

In the specification the interworking normally means only transfer on signalling information from one signalling system to another signalling system, and not the case where the interworking exchange in addition accomplishes some own functions related to the call.

4.2. Echo control procedure

4.2.1. ISUP2 ==> TUP1 / TUP2

4.2.1.1. Action at an interworking exchange after IAM is received from ISUP2-side

The echo control procedure invoked at an interworking exchange is based on the calculated delay value for the connection at the exchange. The calculated value is the sum of the delay obtained from the incoming IAM message and the delay of the outgoing circuit.

A)

When the nature of connection indicators parameter in the IAM message indicates that a half echo control device is already included the actions are independent of the calculated delay value. The following actions occur.

1) The exchange has echo control devices available

- No change is made to the echo control information in the outgoing IAI message
- The exchange notes in memory that there may be a need to include an incoming half echo control device in the circuit for this call provided the exchange does not know that the succeeding exchange will include an incoming half echo control device.
- Any outgoing half echo control device is disabled.

2) The exchange does not have any echo control devices available

- No change is made to the echo control information in the outgoing IAI message

B)

When the nature of connection indicators parameter in the IAM message does not indicate that a half echo control device is already included or the exchange has not sufficient information to determine that echo control device is required for the outgoing circuit the action depends on the delay value, if available. In case the calculated delay value is not available, no special action is taken. If the calculated delay value is available and higher than the allowed value or the exchange has sufficient information to determine that echo control is necessary the following actions occur.

1) The exchange has echo control devices available

- The exchange notes in memory that there may be a need to include an outgoing half echo control device in the circuit for this call
- The exchange notes in memory that there may be a need to include an incoming half echo control device in the circuit for this call provided the exchange does not know that the succeeding exchange will include an incoming half echo control device
- The echo control device indicator in the outgoing IAI messages is set to "outgoing half echo suppressor included"

2) The exchange does not have echo control devices available.

- The echo control device indicator in the outgoing IAI messages is set to "outgoing half echo suppressor not included"

4.2.1.2. Action at an interworking exchange after ACM is received from TUP-side**A)**

The ACM is received with message indicator bit D = 0 (no incoming half echo suppressor included)

1) The exchange has a note in memory that there may be a need to include an incoming half echo control device in the circuit for the call.

- The incoming half echo control device is included
- The echo control device indicator in the ACM message, is set to "incoming echo device included".

2) The exchange has not a note in memory that there may be a need to include an incoming half echo control device in the circuit for the call.

- No special action is taken.

B)

The ACM is received with message indicator bit D = 1 (incoming half echo suppressor included)

1) The exchange has included incoming half echo control device in the circuit for the call

- It shall release the incoming half echo control device
- The echo control device indicator is set to 1 in the backward call indicators parameter in the ACM message.

If the exchange knows that an outgoing half echo control device in the circuit for the call is included in a preceding exchange.

- The echo control information parameter in the ACM message is set to
 - a) outgoing half echo control device request
 - b) outgoing half echo control device not included

If the exchange has note in memory that there may be a need to include an outgoing or incoming half echo control device in the circuit for the call.

- The echo control information parameter in the ACM message is set to
 - a) outgoing half echo control device request
 - b) outgoing half echo control device included
- The timer T37 is started.

2) The exchange has not included incoming half echo control device in the circuit for the call

- The echo control device indicator is set to 1 in the backward call indicators parameter in the ACM message.

If the exchange knows that an outgoing half echo control device in the circuit for the call is included in a preceding exchange.

- The echo control information parameter in the ACM message is set to
 - a) outgoing half echo control device request
 - b) outgoing half echo control device not included

If the exchange does not know that an outgoing half echo control device in the circuit for the call is included in a preceding exchange, and the calculated delay value is available and higher than the allowed one.

- If the exchange has not an outgoing half echo control device available
The echo control information parameter in the ACM message is set to
 - a) outgoing half echo control device request
 - b) outgoing half echo control device not included
- If the exchange has an outgoing half echo control device available
The echo control information parameter in the ACM message is set to
 - a) outgoing half echo control device request
 - b) outgoing half echo control device included

The timer 37 is started

3) If the exchange receives a NRM message from the preceding exchange indicating in the echo control information parameter that an outgoing half echo control device is included.

- The outgoing half echo control device is disabled.
- The timer T37 is stopped.

4) If the exchange receives a NRM message from the preceding exchange indicating in the echo control information parameter that an outgoing half echo control device is not included.

- The outgoing half echo control device is included.
- The timer T37 is stopped.

5) The outgoing echo control device is included if the timer T37 expires.

4.2.2. TUP1 / TUP2 ==> ISUP2

4.2.2.1. Action at an interworking exchange after IAI is received from TUP-side

A)

When the message indicators parameter in the IAI message indicates that a half echo control device is already included the actions are independent of the calculated delay value. The following actions occur.

1) The exchange has echo control devices available

- The nature of connection indicator parameter field bit E is set to 1 in the outgoing IAM message
- The exchange notes in memory that there may be a need include an incoming half echo control device in the circuit for this call provided the exchange does not know that the succeeding exchange will include an incoming half echo control device.
- Any outgoing half echo control device is disabled.

2) The exchange does not have any echo control devices available

- The nature of connection indicator parameter field bit E is set to 1 in the outgoing IAM message

B)

When the message indicators parameter in the IAI message does not indicate that an outgoing half echo control device is already included or the exchange has not sufficient information to determine that echo control device is required for the outgoing circuit the action depends on the delay value, if available. In case the calculated delay value is not available, no special action is taken. If the calculated delay value is available and higher than the allowed value or the exchange has sufficient information to determine that echo control is necessary the following actions occur.

1) The exchange has echo control devices available

- The exchange notes in memory that there may be a need to include an outgoing half echo control device in the circuit for this call
- The exchange notes in memory that there may be a need to include an incoming half echo control device in the circuit for this call provided the exchange does not know that the succeeding exchange will include an incoming half echo control device
- The nature of connection indicators parameter bit E is set to 1 in the outgoing IAM messages.

2) The exchange does not have echo control devices available.

- No special action is taken.

4.2.2.2. Action at an interworking exchange after ACM or CON is received from ISUP2-side**A)**

The ACM or CON is received with nature of connection field parameter "no incoming half echo included".

1) The exchange has a note in memory that there may be a need to include an incoming half echo control device in the circuit for the call.

- The incoming half echo control device is included
- The message indicator in the ACM message, is set to "incoming half echo suppressor included".

2) The exchange has not a note in memory that there may be a need to include an incoming half echo control device in the circuit for the call.

- The message indicator in the ACM message, is set to "incoming half echo suppressor not included".

B)

The ACM or CON is received with nature of connection field parameter "incoming half echo suppressor included".

1) The exchange has included incoming half echo control device in the circuit for the call

- It shall release the incoming half echo control device
- The message indicator in the ACM message, is set to "incoming half echo suppressor included".

If the exchange knows that an outgoing half echo control device in the circuit for the call is included in a preceding exchange.

- The message indicator in the ACM message, is set to "incoming half echo suppressor included". If the exchange has note in memory that there may be a need to include an outgoing or incoming half echo control device in the circuit for the call.

- The message indicator in the ACM message, is set to "incoming half echo suppressor included".
- The outgoing half echo control device is included.

2) The exchange has not included incoming half echo control device in the circuit for the call

- The message indicator in the ACM message, is set to "incoming half echo suppressor included".

C)

The ACM or CON is received with echo control information parameter "incoming half echo control device is requested".

1) If the exchange has half echo control device available.

- An incoming half echo control device included.
- The message indicator in the ACM message, is set to "incoming half echo suppressor included".

2) If the exchange has not half echo control device available.

- No special action is taken.

D)

The ACM , CON or NRM is received with echo control information parameter "outgoing half echo control device is requested".

1) If the exchange has a half echo control device available and it does not know that the preceding exchange has included an outgoing half echo control device.

- The outgoing half echo control device is included
- If the echo control information parameter indicates that an outgoing half echo control device has been included at a succeeding exchange, a NRM message is sent in the forward direction indicating in the echo control information parameter, "outgoing half echo control device included".

2) If the exchange has half echo control device available and it knows that the preceding exchange has included an outgoing half echo control device.

- If the echo control information parameter indicates that an outgoing half echo control device has been included at a succeeding exchange, a NRM message is sent in the forward direction indicating in the echo control information parameter, "outgoing half echo control device included".

4.2.3. Handling of echo control information in GSM-traffic

In the national TUP1 specification (ref. /7/), the use of the message indicators bit G (echo-suppressor indicator) in IAI-message is specified as follows:

- G = 0, outgoing half echo suppressor not included
- G = 1, outgoing half echo suppressor included

In the subsection 3.1 of TUP1 (ref. /7/), normal call set-up procedure is specified and it is referred to diagram 3-1. In the diagram 3-1 bit G = 0, because echo control device is not needed in the speech circuits of the national network.

However, in the outgoing GSM-traffic the outgoing half echo suppressor is included, i.e. bit G = 1. When receiving the value G = 1, the call set-up should continue according to normal procedures, i.e. it is not allowed the release the call.

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5. Interworking of ISUP2 (protocol interworking)

5.1. Interworking of ISUP2 to R2-PABX

5.1.1. Successful call set-up

5.1.1.1. Address information sending sequence

5.1.1.1.1. Calling party's category

On receipt of A-5 (category request), the category is sent to R2-PABX according to the calling party's category received in the IAM as specified in table 5.1.1.

Table 5.1.1

ISUP2		R2-PABX	
IAM		R2 category	
0000 0000	unknown	II-1	ordinary subscriber's line
0000 1001	national operator	II-5	national operator
0000 1010	ordinary calling subscriber	II-1	ordinary subscriber's line
0000 1011	calling subscriber with priority	II-2	subscriber's line with priority
0000 1100	data call	II-6	data transmission
0000 1101	test call	II-3	test call equipment
0000 1110	payphone	II-4	payphone
0000 1111	conference device	II-1	ordinary subscriber's line
0001 0000	alarm device	II-1	ordinary subscriber's line
1110 0000	payphone type2	II-4	payphone
1110 0001	payphone type3	II-4	payphone
1110 0010	payphone type4	II-4	payphone
1110 0011	PBX-subscriber type1	II-1	ordinary subscriber's line
1110 0100	PBX-subscriber type2	II-1	ordinary subscriber's line
1110 0101	PBX-subscriber type3	II-1	ordinary subscriber's line
1110 0110	PBX-subscriber type4	II-1	ordinary subscriber's line

5.1.1.1.2. Calling party's number

If the CLIP is passive concerning the R2-PABX route, then on receipt of A-9 (A-identification request), I-12 signal is sent to R2-PABX.

The sending of calling party's number to R2-PABX is applicable only, when CLIP is active. Please see subsection 5.1.4.22.

5.1.1.2. Address complete

The following interworking cases are identified:

5.1.1.2.1. Case 1

If the destination exchange can determine, that the whole called party number has been received, then the ACM-message is sent to ISUP2 side without waiting address complete signal from R2-PABX. The ACM-message is coded as follows:

backward-call indicators:

bits BA: charge indicator
 01 (no charge) if R2-PABX route is defined charge-free
 10 (charge)
 bits DC: called party's status indicator.
 00 (no indication)
 bits FE: called party's category indicator
 00 (no indication)
 bit I: interworking indicator
 0 (no interworking encountered)
 bit K: ISUP indicator
 1 (ISUP used all the way)
 bit M: ISDN-access indicator
 0 (terminating access non-ISDN)
 bit N: echo control device indicator

The following cases are identified:

If bit E of the echo control device indicator received in the IAM-message is coded "0" (no outgoing half echo control device is included), then bit N is coded to "0" (incoming half echo control device not included).

If bit E of the echo control device indicator received in the IAM-message is coded "1" (an outgoing half echo control device is included), then:

- a) if an incoming half echo control device is locally included, then bit N is coded to "1" (incoming half echo control device included).
- b) if no incoming half echo control device is locally available, then bit N is coded to "0" (incoming half echo control device not included).

other bits: coded 0.

If A-6 signal is received from R2-PABX, then CPG-message is sent to ISUP2 side and coded as follows:

event information:

bits GFEDCBA: event indicator
 0000001 (alerting)
 bit H: event presentation restricted indicator
 0 (no indication)

Backward call indicator parameter field is not included in the CPG-message in this case, because no new information can be sent to ISUP2 side.

If B-6 signal is received from R2-PABX, then CPG-message is sent to ISUP2 side and coded as follows:

event information:

bits GFEDCBA: event indicator
 0000001 (alerting)
 bit H: event presentation restricted indicator
 0 (no indication)

backward-call indicators:

bits DC: called party's status indicator.
 01 (subscriber free)

other bits are coded as indicated in the ACM-message.

The speech condition is set-up when the address complete message is sent to ISUP2 side.

On receipt of the A-3 signal, the R2 category to be sent is the same as in response to the A-5 signal.

5.1.1.2.2. Case 2

If the destination exchange can't determine, that the whole called party number has been received, then ACM-message is sent to ISUP2 side on receipt of an address complete signal from the R2-PABX side. The ACM-message is coded as follows:

backward-call indicators:

bits	BA:	charge indicator
	01	(no charge) if R2-PABX route is defined charge-free
	10	(charge)
bits	DC:	called party's status indicator.
	00	(no indication) if A-6 is received;
	01	(subscriber free) if B-6 is received.
bits	FE:	called party's category indicator
	00	(no indication)
bit	I:	interworking indicator
	0	(no interworking encountered)
bit	K:	ISUP indicator
	1	(ISUP used all the way)
bit	M:	ISDN-access indicator
	0	(terminating access non-ISDN)
bit	N:	echo control device indicator

Bit N is coded as indicated in subsection 5.1.1.2.1

other bits: coded 0.

The speech condition is set-up when the address complete message is sent to ISUP2 side.

On receipt of the A-3 signal, the R2 category to be sent is the same as in response to the A-5 signal.

5.1.1.3. Answer

On receipt of the answer signal from R2-PABX side, the ANM-message is sent to ISUP2 side without backward call indicators.

5.1.1.4. Clear-back/re-answer sequence**5.1.1.4.1. Action at non-tariff determining point**

On receipt of the clear-back signal from R2-PABX side, the SUS-message (network) is sent to ISUP2 side. After the receipt of the clear-back signal, on receipt of the answer signal (re-answer) from R2-PABX side, the RES-message (network) is sent to ISUP2 side. The number of clear-back/answer (suspend/resume) sequence is not limited.

5.1.1.4.2. Action at tariff determining point

On receipt of the clear-back signal from R2-PABX side, the SUS-message (network) is sent to ISUP2 side and a timer T6 is started. Charging takes place during the on-hook condition. After the receipt of the clear-back signal, on receipt of the answer signal (re-answer) from R2-PABX side, the RES-message (network) is sent to ISUP2 side and the timer T6 is stopped. The timer T6 is also stopped, if REL-message is received from ISUP2 side. If the timer T6 expires, the release procedure is initiated to both sides, i.e. REL-message is sent to ISUP2 side with the cause value 102 (recovery on timer expiry) and with the location "private network serving the remote user" and clear forward signal is sent to R2-PABX side.

5.1.1.5. Metering

The PABX does not send metering pulses to the exchange.

5.1.1.6. Forced release

The PABX does not send forced release signal to the exchange.

5.1.1.7. Fallback

If the circuit controlled by ISUP2 is satisfying the connection type requirements of "64 kbit/s unrestricted preferred", the interworking exchange should initiate appropriate actions and procedures. The interworking exchange should include the TMU parameter (which has been set according to the fallback connection type indicated in the TMR prime parameter) in the ACM, indicating that fallback has occurred for this call.

5.1.1.8. Propagation delay

The interworking exchange shall store the propagation delay value accumulated up to this point until the call is released. If a delay value referring to the part of the connection where the procedure is not supported is available, this delay value shall be added to the stored one.

The interworking exchange shall include the call history information parameter, set to the stored delay value, in the ANM.

5.1.2. Call release and call failures**5.1.2.1. ISUP2 side**

On receipt of a REL-message, a RSC-message, a GRS-message or a CGB-message (hardware) from ISUP2 side, then

- the clear-forward signal is sent to R2-PABX side.

In case of failure due to ISUP2 side (the failure, which prevents to set-up or continue the call), the clear-forward signal is sent to R2-PABX side.

5.1.2.2. R2-PABX side

On receipt of a call unsuccessful signal from R2-PABX side or in case of failure to the R2-PABX side, the REL-message is sent to ISUP2 side with the location "private network serving the remote user" and with the cause values as specified in table 5.1.2.

Table 5.1.2

ISUP2 sent cause value	R2-PABX received signal
17 (user busy)	B-3 (subscriber's line busy)
47 (resource unavailable, unspecified)	B-4 (congestion)
102 (recovery on timer expiry)	timer expiry (the timer expiry causes the release of the call)
111 (protocol error, unspecified)	unexpected signal

5.1.3. Reaction for supplementary services**5.1.3.1. UUS****5.1.3.1.1. UUS1 implicit**

User-to-user information is discarded. The ISDN access indicator in the backward call indicators parameter in the ACM-message is set to "terminating access non-ISDN", and by means of that information the originating exchange can notify, that the user-to-user information is discarded. The call continues according to the basic call procedures.

5.1.3.1.2. UUS1 explicit, non-essential

User-to-user information is discarded. The user-to-user indicators parameter in the ACM-message contains the indication "service 1 not provided". The call continues according to the basic call procedures.

5.1.3.1.3. UUS2, non-essential

The user-to-user indicators parameter in the ACM-message contains the indication "service 2 not provided". The call continues according to the basic call procedures.

5.1.3.1.4. UUS3, non-essential, requested during call set-up

The user-to-user indicators parameter in the ACM-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.1.3.1.5. UUS3, non-essential, requested after call set-up

The user-to-user indicators parameter in the FRJ-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.1.3.2. CLIP / CLIR

On receipt of A-9 signal (A-identification request) from R2-PABX, and if the CLIR is active, i.e. the address presentation restricted indicator is presentation restricted in the received IAM-message, then I-12 signal is sent R2-PABX.

For CLIP service, see subsection 5.1.4.20.

5.1.3.3. CUG

If the CUG call indicator in the IAM is;

- CUG with outgoing access, the call is treated as an ordinary call;
- non-CUG, the call is treated as an ordinary call.
- CUG without outgoing access, the call is cleared and the REL-message is sent to ISUP2 side with the cause value 53 (outgoing calls barred within CUG) and with the location "private network serving the remote user".

5.1.3.4. COLP / COLR

If a request of COLP is included in the received IAM (bit H=1 of connected line request indicator), the ANM-message is sent with the connected number parameter with indication "address not available". The call continues according to the basic call procedures.

- connected number parameter
 - nature of address indicator:
0000000 (spare)
 - numbering plan indicator:
000 (spare)
 - address presentation restricted indicator:
10 (address not available)
 - screening indicator:
11 (network provided)

5.1.3.5. SUB

Access transport parameter is discarded. The call continues according to the basic call procedures.

5.1.3.6. TP

The suspend/resume (SUS/RES) (user initiated) messages are discarded without notification. The call continues according to the basic call procedures.

5.1.3.7. MCID

See subsection 5.1.4.15.

5.1.3.8. Call Diversion services

If the call is diverted, (the redirection counter in the redirection information parameter field is >0 in the IAM-message), then R2 category II-11 (forwarded call) is sent to R2-PABX. The other information in the redirection information parameter field is discarded. Also the generic notification indicator parameter and the original called number parameter are discarded.

On receipt of A-9 (A-identification request) from R2-PABX, and if the calling party's number (default value is calling party's number) is transferred to the R2-PABX in case of forwarded call based on the R2-PABX route definition, then the function is as stated in subsection 5.1.4.20. In this case also the redirecting number parameter is discarded.

Based on the R2-PABX route definition it is possible to transfer the redirecting number to the R2-PABX instead of calling party's number in case of forwarded call. In that case the information is taken from the redirecting number parameter of the IAM-message. In other way the function is as stated in subsection 5.1.4.20.

5.1.3.9. CW

Not applicable.

5.1.3.10. CH

Not applicable.

5.1.3.11. CONF

Not applicable.

5.1.3.12. 3PTY

Not applicable.

5.1.3.13. AOC

No impact.

5.1.3.14. MSN

Not applicable.

5.1.3.15. DDI

An ACM-message is sent to ISUP2 side as soon as the destination local exchange has received the complete called party number and has selected a free circuit to the R2-PABX. The called line status is set to "no indication" in ACM-message.

If the destination local exchange has no knowledge about the number of DDI digits required to set up the call, it selects a free circuit, sends the received DDI digits to the R2-PABX and returns an ACM-message as soon as it has received address complete signal from the R2-PABX. The called line status is set in the ACM-message to "no indication", if A-6 signal is received or to "subscriber free", if B-6 signal is received from R2-PABX.

5.1.4. Reaction for national subscriber services**5.1.4.1. Abbreviated Dialling**

No impact.

5.1.4.2. Last Number Redial

No impact.

5.1.4.3. Hot Line without Time Supervision

No impact.

5.1.4.4. Hot Line with Time Supervision

No impact.

5.1.4.5. Alarm Call

On receipt of A-5, the calling party's category "alarm device" is interpreted to R2 category II-1 (ordinary subscriber's line) as specified in subsection 5.1.1.1.1, table 5.1.1. Otherwise the call will be completed according to the basic call procedures.

5.1.4.6. Outgoing Call Barring

No impact.

5.1.4.7. Incoming Call Barring

No impact.

5.1.4.8. Absent Subscriber Service

If B-9 signal is used between PABX and the public exchange (the user of the PABX and the network operator have agreed upon it), then on receipt of B-9 signal, R2-PABX side is released and the call is diverted to the absent subscriber service.

If B-9 signal has not been agreed to be used, it is interpreted an unexpected signal. The R2-PABX side is released and ISUP2 is released according to subsection 5.1.2.2 with cause value 111.

5.1.4.9. Call Forwarding Services

For the redirection information concerning Call Forwarding Services see subsection 5.1.3.8.

5.1.4.10. Priority Call

The information of priority call can be received from ISUP2 side in Calling party's category 00001011. On receipt of A-5, the R2-category II-2 is sent to R2-PABX as specified in subsection 5.1.1.1.1. The call will be handled prioritized in the interworking point.

The information of priority call can also be received from ISUP2 side in Network specific facility parameter field in octet 2, network specific facility type and octet 2a, network specific facility. If the call is prioritized, then the B-priority indicator inclusion of octet 2 has value 1 and B-priority indicator of octet 2a has value 1. The call will be handled prioritized in the interworking point. Which R2-category is sent to R2-PABX, depends on the received Calling party's category of ISUP2 side as specified in subsection 5.1.1.1.1, not on Network specific facility parameter.

5.1.4.11. Call Waiting

Call waiting function is done in the destination R2-PABX and has no impact in the interworking exchange.

5.1.4.12. Three Party Service

See subsection 5.1.3.12.

5.1.4.13. Conference Call

See subsection 5.1.3.11.

5.1.4.14. Interception

The interception consists of several cases. The interception information can be received from R2-PABX or the exchange itself recognizes the interception situation, for example R2-PABX route congestion, or unallocated number. Depending on how the different interception cases are handled, the call can be forwarded to the centralized service position, or routed to the announcement in the destination exchange, or send the call failure information to the incoming ISUP2 side and give the announcement in the originating exchange. Also the destinating PABX can have interception function as far as applicable.

From R2-PABX only two call unsuccessful signals can be received, B-3 (busy) and B-4 signal (congestion). If the information is sent to ISUP2 side, then on receipt of a call unsuccessful signal, REL-message is sent with the location "private network serving the remote user" and with the cause values as specified in subsection 5.1.2.2.

5.1.4.15. Malicious Call Identification

The following interworking cases are identified:

5.1.4.15.1. Case 1

If B-1 signal is not used between PABX and the public exchange (B1 signal is interpreted to B-6 signal), then malicious call tracing is based on A-identification.

- a) If the route based CLIP is passive concerning the R2-PABX route, then on receipt of A-9 (A-identification request) from R2-PABX, then I-12 signal is sent to R2-PABX. The call continues according to the basic call procedures.
- b) If the route based CLIP is active concerning the R2-PABX route, then on receipt of A-9 (A-identification request) from R2-PABX, the calling party's national number is sent to R2-PABX as follows:
 - a) If calling party's number is received in IAM-message with the information "presentation allowed", then calling party's national number is sent to R2-PABX.
 - b) If calling party's number is received in IAM-message with the information "presentation restricted", then I-12 signal is sent to R2-PABX.
 - c) If calling party's number is received in IAM-message with the information "incomplete calling party number", then I-12 signal is sent to R2-PABX.
 - d) If calling party number parameter field is received in IAM-message with the information "address not available", then I-12 signal is sent to R2-PABX.
 - e) If calling party number parameter field is not received in IAM-message, then INR-message with the A bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side.
 - f) If calling party's number is received in INF-message with the information "presentation allowed", then calling party's national number is sent to R2-PABX. In other cases I-12 signal is sent to R2-PABX.

5.1.4.15.2. Case 2

If B-1 signal is used between PABX and the public exchange, then malicious call tracing is based on A-identification and/or holding of the connection.

It is assumed that the route based CLIP is active concerning the R2-PABX route.

On receipt of A-9 (A-identification request) from R2-PABX, then:

- a) If calling party's number is received in IAM-message with the information "presentation allowed", then calling party's national number is sent to R2-PABX.
- b) If calling party's number is received in IAM-message with the information "presentation restricted", then I-12 signal is sent to R2-PABX.

- c) If calling party's number is received in IAM-message with the information "incomplete calling party number", then I-12 signal is sent to R2-PABX.
- d) If calling party number parameter field is received in IAM-message with the information "address not available", then I-12 signal is sent to R2-PABX.
- e) If calling party number parameter field is not received in IAM-message, then INR-message with the A bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side.
- f) If calling party's number is received in INF-message with the information "presentation allowed", then calling party's national number is sent to R2-PABX.
- g) In other cases I-12 signal is sent to R2-PABX.

If B-1 signal is received from R2-PABX in the points c), d) or g) above, then INR-message with the H bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side. When INF-message is received from ISUP2 side, then ACM-message is sent to ISUP2 side and the Tz timer is initiated if INF contains no calling line identity. The Tz timer is stopped at the receipt of answer signal from R2-PABX side. If the Tz timer expires (answer signal is not received from R2-PABX), an EHL message is sent to ISUP2 side.

If the called subscriber cleared without making MCID request, then Clear Back signal is received from R2-PABX side and SUS (network) and EHL-message are sent to ISUP2 side.

If the called subscriber makes MCID request, then Clear Back signal is not received from R2-PABX side and the connection is held.

If REL-message is received from ISUP2 side during Tz timer running and the called subscriber did not answer (answer signal is not received from R2-PABX), then ISUP2 side is cleared normally, but clearing of the call is delayed in the ISUP2 / R2-PABX interworking exchange and the R2-PABX side is cleared after Tz timer expires.

5.1.4.15.3 Case 3

If the route based CLIP and "override category" are active concerning the R2-PABX route, and B-1 signal is used between PABX and the public exchange, then malicious call tracing is based on A-identification and/or holding of the connection.

It is assumed that the route based CLIP is active concerning the R2-PABX route.

On receipt of A-9 (A-identification request) from R2-PABX, then:

- a) If calling party's number is received in IAM-message with the information "presentation allowed" or "presentation restricted", then calling party's national number is sent to R2-PABX.
- b) If calling party's number is received in IAM-message with the information "incomplete calling party number", then the received calling party's number is sent to R2-PABX.
- c) If calling party number parameter field is received in IAM-message with the information "address not available", then I-12 signal is sent to R2-PABX.
- d) If calling party number parameter field is not received in IAM-message, then INR-message with the A bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side.
- e) If calling party's number is received in INF-message with the information "presentation allowed" or "presentation restricted", then calling party's national number is sent to R2-PABX.
- f) If calling party's number is received in INF-message with the information "incomplete calling party number", then the received calling party's number is sent to R2-PABX.
- g) In other cases I-12 signal is sent to R2-PABX.

If B-1 signal is received from R2-PABX in the points b), c) or g) above, then INR-message with the H bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side. When INF-message is received from ISUP2 side, then ACM-message is sent to ISUP2 side and the Tz timer is initiated initiated if

INF contains no calling line identity. The Tz timer is stopped at the receipt of answer signal from R2-PABX side. If the Tz timer expires (answer signal is not received from R2-PABX), an EHL message is sent to ISUP2 side.

If the called subscriber cleared without making MCID request, then Clear Back signal is received from R2-PABX side and SUS (network) and EHL-message are sent to ISUP2 side.

If the called subscriber makes MCID request, then Clear Back signal is not received from R2-PABX side and the connection is held.

If REL-message is received from ISUP2 side during Tz timer running and the called subscriber didn't answer (answer signal is not received from R2-PABX), then ISUP2 side is cleared normally, but clearing of the call is delayed in the ISUP2 / R2-PABX interworking exchange and the R2-PABX side is cleared after Tz timer expires.

5.1.4.16. Trunk Offering (Intervention)

Not applicable.

5.1.4.17. Completion of Calls to Busy Subscriber

Not applicable.

5.1.4.18. Digital Path Provision

On receipt transmission medium requirement 00000010 64 kbit/ unrestricted, this information is sent to R2-PABX by means of R2 category II-13. Otherwise the call will be completed according to the basic call procedures.

5.1.4.19. Closed User Group

See subsection 5.1.3.3.

5.1.4.20. Calling Line Identification Presentation

If the route based CLIP is passive concerning the R2-PABX route, then on receipt of A-9 (A-identification request) from R2-PABX, then I-12 signal is sent to R2-PABX.

If the route based CLIP is active concerning the R2-PABX route, then the following interworking cases are identified:

5.1.4.20.1. Case 1

If the route based CLIP is active concerning the R2-PABX route, then on receipt of A-9 (A-identification request) from R2-PABX:

- a) If calling party's number is received in IAM-message with the information "presentation allowed", then calling party's national number is sent to R2-PABX.
- b) If calling party's number is received in IAM-message with the information "presentation restricted", then I-12 signal is sent to R2-PABX.
- c) If calling party's number is received in IAM-message with the information "incomplete calling party number", then I-12 signal is sent to R2-PABX.
- d) If calling party number parameter field is received in IAM-message with the information "address not available", then I-12 signal is sent to R2-PABX.
- e) If calling party number parameter field is not received in IAM-message, then INR-message with the A bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side.
- f) If calling party's number is received in INF-message with the information "presentation allowed", then calling party's national number is sent to R2-PABX. In other cases I-12 signal is sent to R2-PABX.

5.1.4.20.2. Case 2

If the route based CLIP and "override category" are active concerning the R2-PABX route, then on receipt of A-9 (A-identification request) from R2-PABX:

- a) If calling party's number is received in IAM-message with the information "presentation allowed" or "presentation restricted", then calling party's national number is sent to R2-PABX.
- b) If calling party's number is received in IAM-message with the information "incomplete calling party number", then the received calling party's number is sent to R2-PABX.
- c) If calling party number parameter field is received in IAM-message with the information "address not available", then I-12 signal is sent to R2-PABX.
- d) If calling party number parameter field is not received in IAM-message, then INR-message with the A bit of the Information Request Indicators parameter field set to value 1 is sent to ISUP2 side.
- e) If calling party's number is received in INF-message with the information "presentation allowed" or "presentation restricted", then calling party's national number is sent to R2-PABX.
- f) If calling party's number is received in INF-message with the information "incomplete calling party number", then the received calling party's number is sent to R2-PABX. In other cases I-12 signal is sent to R2-PABX.

5.1.4.21. Calling Line Identification Restriction

See subsection 5.1.4.20.

5.1.4.22. Restricted Access to Called Party

Not applicable.

5.1.4.23. Itemised Charging

No impact.

5.1.4.24. Private Metering

No impact.

5.1.4.25. Direct Dialling In

See subsection 5.1.3.15.

5.1.4.26. Line Hunting

No impact.

5.1.4.27. Distinctive Ringing

Not applicable.

5.2. Interworking of R2-PABX to ISUP2

5.2.1. Successful call set-up

5.2.1.1. Initial address message

The sent IAM-message of ISUP2 is coded as specified in subclauses 5.2.1.1.1 to 5.2.1.1.9.

5.2.1.1.1. Called party number

The called party number information is set according to ISUP2 specification. No interworking impact.

5.2.1.1.2. Forward call indicators

bit D: interworking indicator
 0 (no interworking encountered)
 bit F: ISUP indicator
 1 (used all the way)
 bits HG: ISUP preference indicator
 01 (not required all the way)
 bit I: ISDN-access indicator
 0 (non-ISDN)
 bits PO: Outgoing call barring indicator
 01 (no barring active), if there are not any barring category active for the PABX route
 10 (barring active), if there are any barring category active for the PABX route
 other bits: coded 0.

5.2.1.1.3. Calling party's category

The calling party's category is coded according to the category received in response to A-5 on the R2-PABX side, as specified in table 5.2.1.

Table 5.2.1

R2-PABX		ISUP2	
R2 category		IAM	
II-1	ordinary subscriber's line	0000 1010	ordinary calling subscriber
II-2	subscriber's line with priority (Note: normal route, interpreted ordinary subscriber's line)	0000 1010	ordinary calling subscriber
II-3	test call equipment	0000 1101	test call
II-4	payphone	0000 1110	payphone
II-6	data transmission	0000 1100	data call
II-11	forwarded call	0000 0000	unknown (redirection information, see subsection 5.2.4.9)
II-13	digital path required	0000 1010	ordinary calling subscriber (transmission medium requirement, see subsection 5.2.1.1.5 and 5.2.4.20)

If the R2-PABX is determined a priority route, then R2 category II-2 is interpreted to IAM category as follows:

II-2 subscriber's line with priority 00001011 calling subscriber with priority

If a fixed PBX-subscriber category is determined on the R2-PABX route, then depending on the category, one of the following IAM-category is sent:

1110 0011	PBX-subscriber type 1
1110 0100	PBX-subscriber type 2
1110 0101	PBX-subscriber type 3
1110 0110	PBX-subscriber type 4

5.2.1.1.4. Nature of connection

bits BA: satellite indicator
 00 (no satellite)
 bit E: echo control indicator
 0 (outgoing half echo control device not included)

5.2.1.1.5. Transmission medium requirement

00000011 (3.1 kHz), normal case, or
 00000010 (64 kbit/s unrestricted), if R2 category is II-13

5.2.1.1.6. Calling party number

nature of address indicator:
 0000011 (national significant number)
 calling party number incomplete indicator:
 0 (complete)
 numbering plan indicator:
 001 (ISDN)
 address presentation restricted indicator:
 00 (presentation allowed), if the PABX-route has no restrictions or
 01 (presentation restricted), if the PABX-route is determined "presentation restricted".
 screening indicator:
 11 (network provided)
 address signals:
 a) if the extension number of the A-subscriber is received from R2-PABX, then the digits consists of national destination code and the whole DDI-number
 b) in the other cases, the digits consists of national destination code and the PABX call number

5.2.1.1.7. Transit network selection

Transit network selection parameter is set according to ISUP2 specification. No interworking impact.

5.2.1.1.8. Network specific facility

Octet 2, network specific facility type and octet 2a, network specific facility are coded as follows:

If the exchange is capable of determining language of the PABX route, then the language indicator inclusion of octet 2 is set to 1 and the language indicator of octet 2a is set to the code of preferred language. In other cases the language indicator of octet 2a is set to default language.

If the exchange has not the capability to determine the priority of B-number, then the B-priority indicator inclusion of octet 2 is set to 0.

If the exchange is capable of determining the priority of B-number, then the B-priority indicator inclusion of octet 2 is set to 1 and B-priority indicator of octet 2a is set to 0 or 1 depending on if the B-number is not prioritized or is prioritized. In other cases the B-priority indicator inclusion of octet 2 is set to 0.

If the exchange is capable of playing the announcements related to call failure as specified in reference /13/ (e.g. it has the connection to the appropriate announcing machine), then the announcement capability indicator inclusion of octet 2 is set to 1 and the announcement capability indicator of octet 2a is set to 1. In other cases the announcement capability indicator of octet 2a is set to 0.

Note: If all indicator values are zero, the NSF parameter is not sent.

5.2.1.2. Propagation delay

The interworking exchange shall insert the propagation delay counter in the IAM-message, setting it to value 0 ms. If a delay value referring to the part of the connection where the procedure is not supported is available, the propagation delay counter shall be set to this delay value.

The calculated delay value in the interworking exchange shall reflect the delay incurred on the preceding circuit.

Prior to sending the IAM to ISUP2 side, the propagation delay counter shall be increased according to the value of the outgoing circuit chosen.

5.2.1.3. Information request

5.2.1.3.1. Calling party address request

In the normal case there should not exist any INR-message, because calling party number is already included in IAM-message.

If INR-message is still received with bit A of the Calling party address request indicator set to 1 "calling party address requested", then INF-message is returned with bits BA of the Calling party address response indicator set to 11 "calling party address included". The calling party number is included in the Calling party number parameter field, see subsection 5.2.1.1.6.

5.2.1.3.2. Holding request

Holding request is not applicable in this interworking case, because A-identification is always possible to send to ISUP2 side. If still INR-message is received with bit B of the Holding indicator set to 1 "holding requested", then INF-message is returned with bit C of the Hold provided indicator set to 0 "hold not provided".

5.2.1.3.3. Calling party's category request

In the normal case there should not exist any INR-message, because calling party category is already included in IAM-message.

If INR-message is still received with bit D of the Calling party's category request indicator set to 1 "calling party's category requested", then INF-message is returned with bit F of the Calling party's category response indicator set to 1 "calling party's category included". The calling party's category is included in the Calling party's category parameter field, see subsection 5.2.1.1.3.

5.2.1.3.4. Malicious call identification request

In the normal case there should not exist any INR-message, because calling party number is already included in IAM-message.

If INR-message is still received with bit H of the Malicious call request indicator set to 1 "malicious call identification requested", then INF-message is returned with bits BA of the Calling party address response indicator set to 11 "calling party address included". The calling party number is included in the Calling party number parameter field, see subsection 5.2.1.1.6.

5.2.1.3.5. C-number check request

On receipt of INR-message with bit L of the C-number check request indicator set to 1 "C-number check requested" and containing C-number, the functions described in reference /4/, subsection 4.18 Original calling party barring, Action at the originating exchange, are applied.

5.2.1.4. Address complete

On receipt of an ACM-message from ISUP2 side, A-6 signal is sent to R2-PABX.

Through connection should occur after sending of the address complete signal (A-6) to R2-PABX side.

5.2.1.5. Call progress

CPG-message is discarded and has no impact to R2-PABX side.

5.2.1.6. Answer

On receipt of an ANM-message from ISUP2 side, the answer signal is sent to R2-PABX-side.

5.2.1.7. Connect

On receipt of a CON-message, A-6 signal is sent to R2-PABX and then an answer signal is sent to R2-PABX side.

Through connection should occur after sending of the address complete signal (A-6) to R2-PABX side.

5.2.1.8. Clear-back/re-answer sequence**5.2.1.8.1. Action at non-tariff determining point**

Not applicable. Tariff determining point is always applied.

5.2.1.8.2. Action at tariff determining point

On receipt of the SUS-message (network) from ISUP2 side, a timer T6 is started. Charging takes place during the suspend procedure (on-hook condition) and no 'Clear back' indication is sent to the PABX.

After the receipt of the RES-message (network) from ISUP2 side, the timer T6 is stopped. The timer T6 is also stopped, if REL-message is received from ISUP2 side or if clear forward signal is received from R2-PABX side.

If the timer T6 expires, the release procedure is initiated to both sides, i.e. forced release signal is sent to R2-PABX side and REL-message is sent to ISUP2 side with the cause value 102 and with the location "private network serving the local user".

5.2.1.9. Metering pulse message

When receiving MPM-message from ISUP2 side with the information number of metering pulses, the corresponding number of metering pulse signals are sent to R2-PABX side. See also clause 5.2.4.24.

5.2.1.10. Charge message

When receiving CHG-message from ISUP2 side, the charging information of CHG-message must be able to change to metering pulses, and the corresponding number of metering pulse signals are sent to R2-PABX side for the purpose of private metering. See also clause 5.2.4.24.

5.2.2. Call release and call failures**5.2.2.1. ISUP2 side**

On receipt of a REL-message, a RSC-message, a GRS-message or a CGB-message (hardware), the R2-PABX action is depending on the call state of the call as specified in table 5.2.2. Concerning the announcements, see reference /13/.

Table 5.2.2

R2-PABX sent signal	ISUP2 received cause value or received message
before ACM	
B-5	1, 2
B-2	4
B-5	5
B-3	16, 17, 19
B-4	18
A-6 and announcement 8	20
A-4 (B-4)	21
B-10	22
B-8	27
A-6 and announcement 4	28
A-4 (B-4)	29, 31
A-4	34
A-6 and announcement 7	38
A-4 (B-4)	41, 42, 44, 47, 58, 91, 95
A-6 and announcement 5	50, 57, 62, 63
A-6 and announcement 9	53, 55, 87, 88, 90
A-6 and announcement 6	65, 69, 70, 79
B-2	97, 99, 102, 111, 127
after ACM and before ANM	
Congestion tone	any cause received
Congestion tone	RSC, GRS, CGB (hardware)
after ANM or CON or RES (network)	
Forced release	any cause received
Forced release	RSC, GRS, CGB (hardware)
after SUS (network)	
Forced release	any cause received
Forced release	RSC, GRS, CGB (hardware)

In other cases of failure due to the ISUP2 side (for example timer expiry), the same rules as given above are applied.

5.2.2.2. R2-PABX side

On receipt of clear-forward signal from R2-PABX side, the REL-message is sent to ISUP2 side with the cause value 16 and with the location "private network serving the local user".

In case of failure to the R2-PABX side (for example timer expiry) the REL-message is sent to ISUP2 side with the cause value 102 and with the location "private network serving the local user".

5.2.3. Reaction for supplementary services**5.2.3.1. UUS**

User-to-user services are not applicable.

5.2.3.2. CLIP / CLIR

The calling party number is transferred to ISUP2 side as stated in subsection 5.2.1.1.6.

5.2.3.3. CUG

Not applicable.

5.2.3.4. COLP / COLR

Not applicable.

5.2.3.5. SUB

Not applicable.

5.2.3.6. TP

The suspend/resume (SUS/RES) (user initiated) messages are discarded without notification. The call continues according to the basic call procedures.

5.2.3.7. MCID

See subsection 5.2.1.3.4.

5.2.3.8. Call Diversion services

See subsection 5.2.4.9.

5.2.3.9. CW

The CPG-message containing the generic notification indicator parameter is discarded. The call continues according to the basic call procedures.

5.2.3.10. CH

The CPG-message containing the generic notification indicator parameter is discarded. The call continues according to the basic call procedures.

5.2.3.11. CONF

The CPG-message containing the generic notification indicator parameter is discarded. The call continues according to the basic call procedures.

5.2.3.12. 3PTY

The CPG-message containing the generic notification indicator parameter is discarded. The three-way conversation will be completed according to the basic call procedures.

5.2.3.13. AOC

Not applicable for R2-PABX.

5.2.3.14. MSN

No impact.

5.2.3.15. DDI

No impact.

5.2.4. Reaction for national subscriber services**5.2.4.1. Abbreviated Dialling**

No impact.

5.2.4.2. Last Number Redial

No impact.

5.2.4.3. Hot Line without Time Supervision

No impact.

5.2.4.4. Hot Line with Time Supervision

No impact.

5.2.4.5. Alarm Call

R2-PABX does not transfer alarm call category. No impact.

5.2.4.6. Outgoing Call Barring

See subsection 5.2.1.1.2, bits PO (outgoing call barring indicator).

5.2.4.7. Incoming Call Barring

No impact.

5.2.4.8. Absent Subscriber Service

No impact.

5.2.4.9. Call Forwarding services

If the call is a diverted call from the R2-PABX, i.e R2 category II-11 (forwarded call) is received from R2-PABX, then the redirection information parameter field and other information related to call forwarding in the IAM-message is set as follows:

Redirection information

bits	CBA:	Redirecting indicator
	011	(call diversion)
	110	(call diversion, redirection number presentation restricted), if PABX-route is defined "presentation restricted"

bits	HGFE:	Original redirection reasons
	0000	(unknown / not available)

Original called number:

the call number of the PABX , if the extension number is not received from R2-PABX or
the DDI number, if the extension number is received from R2-PABX

Redirecting number:

the same as original called number

Calling party number:

odd / even indicator:	0
nature of address ind.	000000
incomplete ind.	0
numbering plan:	000
address presentation ind.	10 address not available
screening ind.	11 network provided

Called party number:

the dialling received from R2-PABX

Calling party's category:
0000 0000 unknown

If it is not known, which subscriber's identification is received from R2-PABX, then the calling party number, the redirection number and the original called number in the IAM-message are coded "address not available".

The backward information concerning diversion is received in ACM- CPG- ANM- or CON-message. The generic notification indicator parameter, redirection number parameter, redirection number restriction indicator parameter, call diversion information parameter and optional backward call indicators parameter are discarded. The call continues according to the basic call procedures.

5.2.4.10. Priority Call

If a priority route is used between PABX and the exchange, then the calling party's category (calling subscriber with priority) is transferred as stated in subsection 5.2.1.1.3.

5.2.4.11. Call Waiting

See subsection 5.2.3.9.

5.2.4.12. Three Party Service

See subsection 5.2.3.12.

5.2.4.13. Conference Call

See subsection 5.2.3.11.

5.2.4.14. Interception

The interception consists of several cases. The interception information can be received from ISUP2 side or the exchange itself recognizes the interception situation, for example ISUP2 route congestion. Depending on how the different interception cases are handled, the call can be forwarded to the centralized service position, send an announcement or applicable tone from the exchange to the R2-PABX, or send the call failure information to the R2-PABX side.

From ISUP2 side several cause values can be received in REL-message. The received cause values are interpreted to R2-PABX side as specified in subsection 5.2.2.1.

5.2.4.15. Malicious Call Identification

See subsection 5.2.1.3.4.

5.2.4.16. Trunk Offering (Intervention)

Not applicable.

5.2.4.17. Completion of Calls to Busy Subscriber

Not applicable.

5.2.4.18. Digital Path Provision

On receipt of R2 category II-13, this information is transferred to ISUP2 side by means of transmission medium requirement 00000010 64 kbit/s unrestricted.

5.2.4.19. Closed User Group

Not applicable.

5.2.4.20. Calling Line Identification Presentation

The calling party number is transferred to ISUP2 side as stated in subsection 5.2.1.1.6.

5.2.4.21. Calling Line Identification Restriction

The "presentation restricted" information is sent to ISUP2 side based on the PABX-route definition. See subsection 5.2.1.1.6.

5.2.4.22. Restricted Access to Called Party

No impact.

5.2.4.23. Itemised Charging

No impact.

5.2.4.24. Private Metering

If private metering is active for the R2-PABX route and MPM- or CHG-message is received with AOC-indicator in the tariff type parameter field, then the corresponding number of metering pulse signals are sent to R2-PABX side, but the metering pulses are not recorded in the charging counters. If private metering is passive for the R2-PABX route, then the received MPM-message with AOC-indicator in the tariff type parameter field is discarded, and the received CHG-message with AOC-indicator in the tariff type parameter is positively acknowledged.

Deleted: or CHG-message

Deleted: .

5.2.4.25. Direct Dialling In

No impact.

5.2.4.26. Line Hunting

No impact.

5.2.4.27. Distinctive Ringing

No impact.

5.3. Interworking of ISUP2 to TUP1

5.3.1 Successful call set-up

5.3.1.1 Initial address message (IAM in ISUP2, IAI in TUP1)

5.3.1.1.1 Called party number

ISUP2		TUP1	
Nature of address indicator		Message indicators	
		Bits BA	
000 0001	subscriber number	00	subscriber number
000 0010	national or international carrier access code included	01	subscriber number
000 0011	national number	10	national number
000 0100	international number	11	international number

When ISUP2 includes the "Transit network selection" parameter (clause 5.3.1.1.7), the "Network identification field" is coded with the "carrier access code" which has to be put before the prefix plus national significant number in national traffic in TUP1. The message indicator's bits BA are set to value 01 independent of the value of "Nature of address indicator" in ISUP2

5.3.1.1.2 Forward call indicator

ISUP2		TUP1	
Nature of address indicator		Message indicators	
Bits		Bits	
A=0/1	national/international call indicator	H=0/1	incoming international call indicator
CB=xx	no end-to-end method		discard bits / information
D=0	no interworking encountered	K=1	all signalling system No.7 path
D=1	interworking encountered	K=0	any part
E=0/1	end-to-end information		discard bit / information
F=0/1	ISDN user part indicator		discard bit / information
HG=10	ISDN user part required all the way		disconnect the call
HG=00, 01	other ISDN user part indicator information		discard bits / information
I=0/1	ISDN access indicator		discard bit / information
KJ=xx	SCCP method indicator		discard bits / information
PO=xx	outgoing call barring indicator		discard bits / information

5.3.1.1.3 Calling party category

ISUP2 / IAM		TUP1 / IAI	
0000 0000	unknown	00 0000	unknown
0000 1001	national operator	00 1001	national operator
0000 1010	ordinary calling subscriber	00 1010	ordinary calling subscriber
0000 1011	calling subscriber with priority	00 1011	calling subscriber with priority
0000 1100	data call	00 1100	data call
0000 1101	test call	00 1101	test call
0000 1110	payphone	00 1110	payphone
0000 1111	conference device	00 1111	conference device
0001 0000	alarm device	01 0000	alarm device
1110 0000	payphone type2	00 1110	payphone
1110 0001	payphone type3	00 1110	payphone
1110 0010	payphone type4	00 1110	payphone
1110 0011	PBX-subscriber type1	00 1010	ordinary calling subscriber
1110 0100	PBX-subscriber type2	00 1010	ordinary calling subscriber
1110 0101	PBX-subscriber type3	00 1010	ordinary calling subscriber
1110 0110	PBX-subscriber type4	00 1010	ordinary calling subscriber

5.3.1.1.4 Nature of connection indicators

ISUP2		TUP1	
Nature of connection indicators		Message indicators	
Bits			
BA = 00	no satellite circuit in the connection	DC = 00	no satellite circuit in the connection
BA = 01	one satellite circuit in the connection	DC = 01	satellite circuit in the connection
BA = 10	two satellite circuits in the connection	DC = 01	satellite circuit in the connection
E=0/1	echo control device indicator (note)	G=0/1	echo-suppressor indicator (note)

Note: For echo control procedure, see section 4.3.1.1.

5.3.1.1.5 Transmission medium requirement

ISUP2		TUP1	
Transmission medium requirement		Message information	
		Bits	
0000 0000	speech	J=0	ordinary call
0000 0010	64 kbit/s unrestricted	J = 1	digital path required
0000 0011	3.1 kHz audio	J = 0	ordinary call
0000 0110	64 kbit/s preferred	J = 0	ordinary call
0000 0111	2*64 kbit/s unrestricted		release call
0000 1000	384 kbit/s unrestricted		release call
0000 1010	1920 kbit/s unrestricted		release call

5.3.1.1.6 Calling party number

ISUP2		TUP1	
Calling party number		Calling line identity field	
		Address indicator	
		Bits	
0000 0001	spare (note: code 'subscriber number' may be used during the transfer period of numbering change in Finland)	BA=00	spare
0000 0010	unknown	BA=01	spare
0000 0011	national significant number	BA=10	national significant number
0000 0100	international number	BA=11	international number
Calling party number incomplete indicator		Calling line identity field	
0	complete	D=0	no indication
1	incomplete	D=1	incomplete calling line identity
Address presentation restricted indicator		Calling line identity field	
00	presentation allowed	C=0	calling line identity presentation not restricted
01	presentation restricted	C=1	calling line identity presentation restricted
10	address not available		Address indicator bits DCBA = 0000 and Number of address signal bits DCBA = 0000
Screening indicator		Calling line identity field	
xx			discard bits / information

5.3.1.1.7 Transit network selection

ISUP2		TUP1	
		Message indicators	
		Bits	
Type of network identification			discard field
Network identification plan			discard field
Network identification		BA=01	The carrier access code is added to the beginning of the B-number

5.3.1.1.8 Network specific facility

The parameter is discarded and the call attempt is continued according to basic call.

5.3.1.1.9 Cell global identification

The information is discarded. The call set-up continues according to basic call procedures.

5.3.1.2 Information request (INR in ISUP2, GRQ in TUP1)

ISUP2 <===== TUP1

ISUP2		TUP1	
Information request indicators		General request	
Bits		Bits	
D=0/1	calling party's category request indicator	A=0/1	calling party category request indicator
A=0/1	calling line address request indicator	B=0/1	calling line identity request indicator
	discard bit / information (information has already been received in IAM-message)	C=0/1	original called address request (response with GSM-message)
H=0/1	malicious call identification request indicator	D=0/1	malicious call identification indicator
		F=0/1	echo suppressor request indicator (response with GSM-message bit E=0/1, depending on if outgoing echo suppressor is not available or is available)

5.3.1.3 Information (INF in ISUP2, GSM in TUP1)

ISUP2 =====> TUP1

ISUP2		TUP1	
Information indicators		General forward set-up information message	
Bits		Bits	
BA=00	calling party address not included	B=0	calling party identity not included
BA=01	calling party address not available	B=0	calling party identity not included
BA=11	calling party address included	B=1 F=1 F=0 and C=1	if General request bit B was 1 if General request bit D was 1 if Calling party number is incomplete and General request bit D was 1
C=0/1	hold provided indicator		discard bit / information (link-by-link acknowledgement)
F=0/1	calling party's category response indicator	A=0/1	calling party category indicator
H=0/1	solicited information indicator		discard bit / information

L=0/1	C-number check response indicator		discard bit / information (Not a subject of interworking. Request cannot be received from TUP1 side)
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5.3.1.4 Address complete (ACM)

ISUP2 <=====TUP1

ISUP2		TUP1	
Backward call indicators		Message indicators	
Bits		Bits	
BA=10, FE=00	charge indicator = charge, B-category = no indication	BA=01	address-complete signal, charge
BA=01, FE=00	charge indicator = no charge, B-category = no indication	BA=10	address-complete signal, no charge
BA=00, FE= 10	charge indicator = no indication, B-category = payphone	BA=11	address-complete signal, payphone
DC=00/0 1	called party's status	C=0/1	subscriber free indicator
N=0/1	echo control device indicator (note)	D=0/1	incoming echo suppressor indicator (note)
	discard bit / information	E=0	call not forwarded
	call diversion information parameter CBA: presentation not allowed GFED: 0000 unknown	E=1	call forwarded
I=1	interworking encountered (No.7 not used all the way)	F=0	signalling path, any path
I=0	no interworking encountered (No.7 used all the way)	F=1	all signalling path No. 7 path
	The following information is generated to ISUP2 side		
HG=00	no end-to-end method		
J=0	no end-to-end information		
K=0	ISUP not used all the way		
L=0	not used		
M=0	terminating access non-ISDN		
PO=00	SCCP method (no indication)		

Note: For echo control procedure, see section 4.3.1.2.

5.3.1.5 Answer (ANM in ISUP2, ANU in TUP1)

ISUP2<=====TUP1

ISUP2	TUP1
Answer (ANM)	Answer (ANU)

5.3.1.6 Clear-back / Reanswer (SUS and RES in ISUP2, CBK and ANU in TUP1)

5.3.1.6.1 Action at non-tariff determining point

ISUP2 <===== TUP1

ISUP2	TUP1
Suspend (network) (SUS)	Clear-back (CBK)
Resume (network) (RES)	Answer (ANU)

5.3.1.6.2 Action at tariff determining point

ISUP2 <===== TUP1

ISUP2	TUP1
Suspend (network) (SUS)	Clear-back (CBK)
Resume (network) (RES)	Answer (ANU)

- Clear-back from the TUP1 side starts the timer Td, if it expires the ISUP2 side sends REL message with cause code 127 and location 10 (beyond an interworking point).
- Reanswer (ANU) from the TUP1 side stops the timer.

5.3.1.7 Metering pulse message (MPM in ISUP2 and TUP1)

ISUP2 <===== TUP1

ISUP2	TUP1
MPM message - Tariff type -- bits DCBA = 0000.. 1111 - Number of metering pulses -- bits 4321 = 0001..1111	MPM message - Tariff type -- bits DCBA = 0000.. 1111 - Number of metering pulses -- bits DCBA = 0001..1111

5.3.2 Call release and failures

5.3.2.1 From ISUP2 side

ISUP2 =====>TUP1

ISUP2	TUP1
REL RSC GRS CGB (hardware)	CLF CLF CLF CLF

5.3.2.2 From TUP1 side

The next table is valid if in the Network specific facility parameter the value of "Announcement capability indicator inclusion" is one in the incoming IAM message, or the exchange has not the minimum announcement capability. If this value is zero and the exchange has the minimum announcement capability the exchange sends backward direction some announcement depending on the incoming message from the TUP1 side. Before announcement sending the exchange has to send ACM to ISUP2 side.

ISUP2<=====TUP1

ISUP2	TUP1
REL message with Location = 10 (beyond an interworking point) and with cause value	
16	FRL
42	SEC
34	CGC
28	ADI
31	CFL
17	SSB
1	UNN
27	LOS
4	SST
88	ACB
65	DPN
22	SNC
47	CON
17	EUM (subscriber busy)
31	RSC (note)
31	GRS (note)
31	HGB (note)

Note: Received after receipt of any backward signal

5.3.3 Reaction for supplementary services

5.3.3.1 UUS

5.3.3.1.1 UUS1 implicit

User-to-user information is discarded. The ISDN access indicator in the backward call indicators parameter in the ACM-message is sent to "terminating access non-ISDN", and by means of that information the originating exchange can notify, that the user-to-user information is discarded. The call continues according to the basic call procedures.

5.3.3.1.2 UUS1 explicit, non-essential

User-to-user information is discarded. The user-to-user indicators parameter in the ACM-message contains the indication "service 1 not provided". The call continues according to the basic call procedures.

5.3.3.1.3 UUS2, non-essential

The user-to-user indicators parameter in the ACM-message contains the indication "service 2 not provided". The call continues according to the basic call procedures.

5.3.3.1.4 UUS3, non-essential, requested during call set-up

The user-to-user indicators parameter in the ACM-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.3.3.1.5 UUS3, non-essential, requested after call set-up

The user-to-user indicators parameter in the FRJ-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.3.3.2 CLIP/CLIR

Send calling party number and set "Address indicator" bit c = (depending on CLIP/CLIR)

5.3.3.3 CUG

The incoming CUG information is transferred unchanged to the CUG information of IAI message.

5.3.3.4 COLP/COLR

If a request is included in the received IAM (bit H = 1 of connected line request indicator in the optional forward call indicator parameter),the answer message is sent with the connected number parameter with indicator address not available.

- Connected number parameter
- nature of address indicator:
000 0000
- numbering plan indicator:
000
- address presentation restricted indicator:
0 (address not available)
- screening indicator:
11 (network provided)

5.3.3.5 SUB

The subaddress is discarded.

5.3.3.6 TP

The suspend/resume messages are discarded.

5.3.3.7 MCID

ISUP2<=====TUP1

ISUP2	TUP1
- INR bit H malicious call identification request indicator - INR bit B holding indicator - EHL	- GRQ bit D malicious call identification indicator - HLD - EHL

ISUP2=====>TUP1

ISUP2	TUP1
- INF bits BA calling party address response indicator	- GSM bit F malicious call identification indicator

5.3.3.8 Call diversion services

ISUP2 =====>TUP1

ISUP2	TUP1
IAM message - Redirection information parameter -- parameter not included -- bits KJI ≠ 000 redirection counter	IAI message - Message indicator -- bit I = 0 redirection information -- bit I = 1 redirection information
- Redirecting number	- Original called address

ISUP2 <===== TUP1

ISUP2	TUP1
ACM message call diversion information parameter CBA: presentation not allowed GFED: 0000 unknown	ACM message - Message indicators -- bit E = 1 call forwarding indicator

The ACM-message received from TUP1 side, concerning the diversion of the call (bit E = 1) it transferred backwards to ISUP2 ACM-message in parameter "Call diversion information parameter" (bits CBA = 000 and GFED = 0000).

In case the call is diverted in ISUP2/TUP1 boundary exchange, and the ACM-message is received from TUP1 side, the CPG-message containing appropriate diverting or alerting information is generated and sent to ISUP2 side.

5.3.3.9 CW

Not applicable

5.3.3.10 CH

Not applicable

5.3.3.11 CONF

Not applicable

5.3.3.12 3TPY

Not applicable

5.3.3.13 AOC

Not applicable

5.4. Interworking of TUP1 to ISUP2

5.4.1 Successful call set-up

5.4.1.1 Initial address message (IAI in TUP1, IAM in ISUP2)

5.4.1.1.1 Calling party category

TUP1 / IAI		ISUP2 / IAM	
00 0000	unknown	0000 0000	unknown
00 1001	national operator	0000 1001	national operator
00 1010	ordinary calling subscriber	0000 1010	ordinary calling subscriber
00 1011	calling subscriber with priority	0000 1011	calling subscriber with priority
00 1100	data call	0000 1100	data call
00 1101	test call	0000 1101	test call
00 1110	payphone	0000 1110	payphone
00 1111	conference device	0000 1111	conference device
01 0000	alarm device	0001 0000	alarm device

5.4.1.1.2 Message indicators (IAI)

TUP1		ISUP2	
Message indicators		Nature of address indicator	
Bits BA, Nature of address indicator			
00	subscriber number	000 0001	subscriber number
10	national significant number	000 0011	national significant number
11	international number	000 0100	international number
Bits DC, nature of circuit indicator		Nature of connection indicators	
DC = 00	no satellite circuit in the connection	BA = 00	no satellite circuit in the connection
DC = 01	satellite circuit in the connection	BA = 01	one satellite circuit in the connection
Bit G, echo suppressor indicator		Nature of connection indicators	
G=0	outgoing half echo control device not included	E=0	outgoing half echo control device not included
G=1	outgoing half echo control device included	E=1	outgoing half echo control device included
Bit H, incoming international call indicator		Forward call indicators	
H=0	call other than incoming international call	A=0	national call
H=1	incoming international call indicator	A=1	international call
Bit J, all-digital-path-required indicator		Transmission medium requirement	

Deleted: 01

Deleted: address including national or international operator number

Deleted: 000 0010

Deleted: unknown carrier access code is loaded to "Transit network selection" parameter.

J=0	ordinary call	0000 0001	3.1 kHz audio
J=1	digital path required	0000 0010	64 kbit/s unrestricted
Bit K, signalling path indicator		Forward call indicators	
K=0	no indication	D=1	interworking encountered
K=1	all signalling system No.7 path	D=0	no interworking encountered

5.4.1.1.3 First indicator octet (IAI)

TUP1		ISUP2	
First indicator octet			
Bit A, network capability or user facility information indicator		Network specific facility	
0	network capability or user facility information indicator not included		Not applicable
1	network capability or user facility information indicator included		Not applicable.
Bit B, closed user group information indicator		Optional forward call indicator	
0	closed user group information not included		Not applicable
1	closed user group information included		Bits BA according to "CUG call indicator in TUP and "Closed user group interlock code parameter field "according to TUP coding.
Bit E, calling line identity indicator		Calling party number	
0	calling line identity not included		Not applicable

1	calling line identity included Calling line identity field bits BA nature of address ind. 10 national significant number 11 international number bit C calling line identity presentation indicator 0 calling line identity presentation not restricted 1 calling line identity presentation restricted bit D incomplete calling line ind. 0 no indication 1 incomplete calling line identity bits DCBA number of address signals Calling line identity		Nature of address indicator bits 765 4321 000 0011 nat. significant number 000 0100 international number Address presentation restricted indicator 00 presentation allowed 01 presentation restricted Calling party incomplete indicator 0 complete 1 incomplete Not applicable Address signals according to TUP1 information
Bit F, original called address indicator		Original called number	
0	original called address not included		Not applicable
1	original called address included Original called address field bits BA address indicator 10 national significant number 11 international number bit C calling line identity presentation indicator 0 original called address presentation not restricted 1 original called address presentation restricted bits DCBA number of address signals Calling line identity		Nature of address indicator bits 765 4321 000 0011 nat. significant number 000 0100 international number Address presentation restricted indicator 00 presentation allowed 01 presentation restricted Not applicable Address signals according to TUP1 information

5.4.1.2 General request message / Information request (GRQ in TUP1 and INR in ISUP2)

TUP1 <===== ISUP2

TUP1		ISUP2	
General request		Information request indicators	
Bits		Bits	
B=1	calling party address request indicator	A=1	calling party address indicator
Send "holding request message" (HLD)		B=1	holding request
A=1	calling party's category request indicator	D=1	calling party's category request
D=1	MCID request	H=1	MCID request
	Discard information	L=1	C-number check request

5.4.1.3 General forward set-up information message / Information (GSM in TUP1 and INF in ISUP2)

TUP1 =====> ISUP2

TUP1	ISUP2
Bit A = 1 calling party category included	- Information indicators bit F = 1 and "Calling party's category" is according to TUP1 information
Bit B = 1 calling line identity included	- Information indicators bit BA = 11 and "Calling party number" is according to TUP1 information
Bit C = 1 incoming trunk and transit exchange identity included	- Identity of the incoming trunk circuit and transit exchange is coded according to TUP1 information
Bit F = 0 MCID is not included	- Information indicators bit BA = 00 (calling party address not included)
Bit F = 1 MCID is included	- Information indicators bit BA = 11 and Calling party number parameter is according to TUP1 information

5.4.1.4 Address complete message (ACM)

TUP1 <=====ISUP2

TUP1	ISUP2
Bits BA = 01 address complete charge	- Backward call indicator
Bits BA = 10 address complete no charge	bits BA = 00, 01 (note), 10, 11
Bits BA = 11 address complete payphone	bits BA = 01 (note)
Bit C = 0 called party's status no indication	bits BA = xx + bits FE = 10
Bit C = 1 called party's status subscriber free	bits DC = 00
Bit C = 0 called party's status no indication	bits DC = 01
Discard information	bits DC = 10 connect when free
Bit D = 1 incoming half echo suppressor included	bits FE, J, K, M = xx,x,x,x (note: if FE=10 see the handling of BA above)
Discard parameter	bit N = 1
Discard parameter	- Optional backward call indicator
Discard parameter	- Cause indicators

Discard parameter	- User-to-user indicators
Discard parameter	- User-to-user information
Discard parameter	- Access transport
Bit E = 1 call forwarded Discard information	- Generic notification indicator -- 111 1011 call is diverting -- other values
Discard parameter	- Transmission medium used
See section 4.3.2.	- Echo control information -- bits DC = 10 incoming half echo control device included -- bits FE = 01 outgoing half echo control device activation request -- other values
Discard parameter	- Access delivery information
Discard parameter	- Redirection number
Discard parameter	- Call diversion information
Discard parameter	- Network specific facility
Discard parameter	- Redirection number restriction

NOTE: If there is a need to extend calls of no charge to the area of several network operators the operators must agree the method of application of the indicator.

5.4.1.5 Answer message (ANU in TUP1 and ANM in ISUP2)

TUP1 <=====ISUP2

TUP1	ISUP2
ANU	ANM discard all optional parameters

5.4.1.6 Connect message (ACM and ANU in TUP1 and CON in ISUP2)

TUP1 <=====ISUP2

TUP1	ISUP2
ACM and ANU	CON See parameter handling from point 5.4.1.4 ACM

5.4.1.7 Metering pulse message (MPM)

TUP1 <=====ISUP2

TUP1	ISUP2
MPM Tariff type - bits DCBA = 0000..0101 =0000 =0111 =0000 =1001, 1010 =0000 =0000 - discard message Number of metering pulses - bits DCBA = 0001..1111	MPM Tariff type - bits DCBA = 0000..0101 =0110 =0111 =1000 =1001, 1010 =1011 =1100 - bit E = 1 Number of metering pulses - bits 4321 = 0001..1111

5.4.1.8 Charge message (CHG)

CHG-messages received from the outgoing ISUP2-side are converted to MPM messages. In the conversion the values shall be brought down to a round figure. The MPM messages are sent to incoming side when charging begins i.e. ANU message is received from outgoing side.

The CHG-messages are acknowledged with the CHGA-message normally using indication "tariff accepted by interworking or originating exchange". If the received tariff is not within agreed limits or if it can not be converted into meter pulses, the indication "tariff not accepted by interworking or originating exchange" is used in the CHGA message. If the received CHG-message contains an AOC-indicator, the CHG-message is acknowledged by a CHGA-message containing the indication "tariff not accepted by interworking or originating exchange".

5.4.1.9 Suspend/resume (network initiated) (CBK/ANU in TUP1 and SUS/RES in ISUP2)

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5.4.1.9.1 Action at non-tariff determining point

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TUP1 <=====ISUP2

TUP1	ISUP2
CBK/ANU	SUS/RES

Suspend from the ISUP2 side starts the timer Tf. If Tf expires, FRL message is sent to the TUP1 side, and REL message to the ISUP2 side. Resume (RES) from the ISUP2 side stops the timer.

5.4.1.9.2 Action at tariff determining point

Deleted: 8

Suspend from the ISUP2 side starts the timer Td in the charging point. No CBK-message is sent to the TUP1 side and charging takes place during the 'Clear back' -condition. If Td expires, FRL message is sent to the TUP1 side, and REL message to the ISUP2 side. Resume (RES) from the ISUP2 side stops the timer Td.

5.4.1.10 Suspend/resume (user initiated) (SUS/RES in ISUP2)

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Discard message

5.4.2 Call release and failures

5.4.2.1 Normal release from TUP1 side (CLF)

TUP1 =====>ISUP2

TUP1	ISUP2
CLF	REL message with cause 31 normal unspecified Location 10 beyond an interworking point

5.4.2.2 Normal release from ISUP2 side (REL)

TUP1 <=====ISUP2

TUP1	ISUP2
FRL	REL discard all optional parameters

5.4.2.3 Abnormal release from ISUP2 side

The next table is valid if the bit L (announcement capability) is one in the incoming IAI message, or the exchange has not the minimum announcement capability. If value of bit L is zero and the exchange has the minimum announcement capability the exchange sends backward direction some announcement depending on the incoming message from the ISUP2 side. Before the announcement the exchange has to send ACM to TUP1 side.

TUP1 <=====ISUP2

TUP1	ISUP2
SEC	REL message with cause 42
CGC	34
ADI	28
CFL	18, 21, 29, 31, 41, 95, 20
SSB	17
UNN	1, 2, 5
LOS	27
SST	4, 97, 99, 111, 127
ACB	53, 55, 87, 88, 90
DPN	65
SNC	22
CON	44, 47, 58
FRL	16, 19
After the first backward message but before the ACM-message is received from ISUP2 side	
CFL	RSC, GRS, CGB (hardware)
After the ACM-message is received from ISUP2 side	
FRL	RSC, GRS, CGB (hardware)

5.4.2.4 Abnormal release from TUP1 side

TUP1 =====>ISUP2

TUP1	ISUP2
RSC, GRS, HGB	REL message with cause 31 temporary failure Location 10 beyond an interworking point

Deleted: 41

5.4.3 Reaction for supplementary service

5.4.3.1 UUS

5.4.3.1.1 UUS1 implicit

Not applicable

5.4.3.1.2 UUS1 explicit, non-essential

Not applicable

5.4.3.1.3 UUS2, non-essential

Not applicable

5.4.3.1.4 UUS3, non-essential, requested during call set-up

Not applicable

5.4.3.1.5 UUS3, non-essential, requested after call set-up

The user-to-user indicators parameter in the FRJ-message contains the indication "service 3 not provided".
The call continues according to the basic call procedures.

5.4.3.2 CLIP/CLIR

Send calling party number and set "Address presentation restricted indicator" depending on CLIP/CLIR

5.4.3.3 CUG

The incoming CUG information is transit unchanged to the CUG information of IAM message.

5.4.3.4 COLP/COLR

Not applicable

5.4.3.5 SUB

Not applicable

5.4.3.6 TP

The suspend/resume messages (user initiated) are discarded.

5.4.3.7 MCID

TUP1 <=====ISUP2

TUP1	ISUP2
- GRQ bit D malicious call identification - HLD - EHL	- INR bit H malicious call identification request indicator - INR bit B holding indicator - EHL

TUP1 =====>ISUP2

TUP1	ISUP2
- GSM bit F malicious call identification indicator	- INF bits BA calling party address response indicator

5.4.3.8 Call diversion services

If the call is a diverted call from the TUP1, then the call diversion information in the IAM-message of ISUP2 is set as follows:

Redirection information

bits CBA: Redirecting indicator
 011 (call diversion)
 110 (call diversion, redirection number presentation restricted),if original called addresspresentation is restricted (bit C=1) in TUP1 side..

bits HGFE: Original redirection reasons
 0000 (unknown / not available)

Redirecting number is set according to original called address of TUP1.

Deleted: Original called address is set according to original called address of TUP1.¶

The ACM-message received from ISUP2 side with the parameter "Call diversion information parameter" and / or with call diversion may occur (bit B=1) in optional backward call indicators parameter and / or with notification indicator is "call is diverting" in generic notification parameter, then the information is transferred backwards to TUP1-side in the ACM-message in (bit E = 1).

In case the call is diverted in TUP1/ISUP2 boundary exchange, and the ACM-message is received from ISUP2 side, it is discarded without any notification.

5.4.3.9 CW

Not applicable

5.4.3.10 CH

Not applicable

5.4.3.11 CONF

Not applicable

5.4.3.12 3TPY

Not applicable

5.4.3.13 AOC

If the MPM message is received from ISUP2 side with the tariff type parameter, AOC indicator bit E=1, then the received MPM-message is discarded.

5.5. Interworking of ISUP2 to TUP2

5.5.1. Successful call set-up

5.5.1.1. Initial address message (IAM in ISUP2, IAI in TUP2)

5.5.1.1.1. Called party number

ISUP2		TUP2	
Nature of address indicator		Message indicators	
		Bits BA	
000 0001	subscriber number	00	subscriber number
000 0010	national or international carrier access code included	01	address including national or international operator number
000 0011	national number	10	national number
000 0100	international number	11	international number

When ISUP2 includes the "Transit network selection" parameter (clause 5.5.1.1.7), the "Network identification field" is coded with the "carrier access code" which has to be put before the prefix plus national significant number in national traffic in TUP2. The message indicator's bits BA are set to value 01 independent of the value of "Nature of address indicator" in ISUP2.

5.5.1.1.2. Forward call indicator

ISUP2		TUP2	
Nature of address indicator		Message indicators	
Bits		Bits	
A=0/1	national/international call indicator	H=0/1	incoming international call indicator
CB=xx	no end-to-end method		discard bits / information
D=0	no interworking encountered	K=1	all signalling system No.7 path
D=1	interworking encountered	K=0	any part
E=0/1	end-to-end information		discard bit / information
F=0/1	ISDN user part indicator		discard bit / information
HG=10	ISDN user part required all the way		disconnect the call
HG=00, 01	other ISDN user part indicator information		discard bits / information
I=0/1	ISDN access indicator		discard bit / information
KJ=xx	SCCP method indicator		discard bits / information
PO=xx	outgoing call barring indicator		discard bits / information

5.5.1.1.3. Calling party category

ISUP2 / IAM		TUP2 / IAI	
0000 0000	unknown	00 0000	unknown

0000 1001	national operator	00 1001	national operator
0000 1010	ordinary calling subscriber	00 1010	ordinary calling subscriber
0000 1011	calling subscriber with priority	00 1011	calling subscriber with priority
0000 1100	data call	00 1100	data call
0000 1101	test call	00 1101	test call
0000 1110	payphone	00 1110	payphone
0000 1111	conference device	00 1111	conference device
0001 0000	alarm device	01 0000	alarm device
1110 0000	payphone type2	01 0001	payphone type2
1110 0001	payphone type3	01 0010	payphone type3
1110 0010	payphone type4	01 0011	payphone type4
1110 0011	PBX-subscriber type1	01 0100	PBX-subscriber type1
1110 0100	PBX-subscriber type2	01 0101	PBX-subscriber type2
1110 0101	PBX-subscriber type3	01 0110	PBX-subscriber type3
1110 0110	PBX-subscriber type4	01 0111	PBX-subscriber type4

5.5.1.1.4. Nature of connection indicators

ISUP2		TUP2	
Nature of connection indicators		Message indicators	
Bits		Bits	
BA = 00	no satellite circuit in the connection	DC = 00	no satellite circuit in the connection
BA = 01	one satellite circuit in the connection	DC = 01	satellite circuit in the connection
BA = 10	two satellite circuits in the connection	DC = 01	satellite circuit in the connection
E=0/1	echo control device indicator	G=0/1	echo-suppressor indicator

5.5.1.1.5. Transmission medium requirement

ISUP2		TUP2	
Transmission medium requirement		Message information	
Bits		Bits	
0000 0000	speech	J=0	ordinary call
0000 0010	64 kbit/s unrestricted	J = 1	digital path required
0000 0011	3.1 kHz audio	J = 0	ordinary call
0000 0110	64 kbit/s preferred	J = 0	ordinary call
0000 0111	2*64 kbit/s unrestricted		release call
0000 1000	384 kbit/s unrestricted		release call
0000 1010	1920 kbit/s unrestricted		release call

5.5.1.1.6. Calling party number

ISUP2		TUP2	
Calling party number		Calling line identity field	
Address indicator		Address indicator	

		Bits	
0000 0010	unknown	BA=01	spare
0000 0011	national significant number	BA=10	national significant number
0000 0100	international number	BA=11	international number
Calling party number incomplete indicator		Calling line identity field	
0	complete	D=0	no indication
1	incomplete	D=1	incomplete calling line identity
Address presentation restricted indicator		Calling line identity field	
00	presentation allowed	C=0	calling line identity presentation not restricted
01	presentation restricted	C=1	calling line identity presentation restricted
10	address not available		Address indicator bits DCBA = 0000 and Number of address signal bits DCBA = 0000
Screening indicator		Calling line identity field	
xx			discard bits / information

Deleted: 0000 0001
Deleted: subscriber number
Deleted: BA=00
Deleted: calling party number parameter is discarded ?????????

5.5.1.1.7. Transit network selection

ISUP2	TUP2	
	Message indicators	
	Bits	
Type of network identification		discard field
Network identification plan		discard field
Network identification	BA=01	The carrier access code is added to the beginning of the B-number

5.5.1.1.8. Network specific facility

ISUP2	TUP2	
Length of network identification		discard field
Type of network identification		discard field
Network identification		discard field
Network specific facility		
octet 2	Network specific facility type	
Bits		
1=0/1	Language indicator inclusion	A=0/1 First indicator octet
2	Connection allowed indicator inclusion	discard bit / information
3	B-priority indicator inclusion	discard bit / information
4=0/1	Announcement capability indicator inclusion	L=0/1 Message indicators
octet 2a		

Bits		Bits	
4321	Language indicator	HGFE	Network capability or user facility information indicator
5	Connection allowed indicator		discard bit / information
6	B-priority indicator inclusion		discard bit / information
7=0/1	Announcement capability indicator	L=0/1	Message indicators
8	Extension		discard bit / information

5.5.1.1.9. Cell global identification

ISUP2 IAM message	TUP2 IAI message
Location number parameter - Nature of address indicator 111 1110 GSM 111 1101 NMT 900 111 1100 NMT 450 111 1011 Autonet	First indicator octet, bit C=1 - Additional calling party information indicator bits DCBA 0011 GSM 0010 NMT 900 0001 NMT 450 0100 Autonet
- Internal network number indicator	discard field
- Numbering plan indicator	discard field
- Address presentation restricted indicator 01	discard field
- Screening indicator 11	discard field
- Address signals	bits HGFE = amount of the additional information Additional calling party information = address signals (note: if the number of address signals is odd, the first address signal is given the value '0')

5.5.1.2. Information request (INR in ISUP2, GRQ in TUP2)

ISUP2<===== TUP2

ISUP2		TUP2	
Information request indicators		General request	
Bits		Bits	
D=0/1	calling party's category request indicator	A=0/1	calling party category request indicator
A=0/1	calling line address request indicator	B=0/1	calling line identity request indicator
	discard bit / information (information has already been received in IAM-message)	C=0/1	original called address request (information has already been received in IAM-message)
H=0/1	malicious call identification request indicator	D=0/1	malicious call identification indicator
		F=0/1	echo suppressor request indicator (response with GSM-message bit E=0/1, depending on if outgoing echo suppressor is not available or is available)

5.5.1.3. Information (INF in ISUP2, GSM in TUP2)

ISUP2 =====> TUP2

ISUP2		TUP2	
Information indicators		General forward set-up information message	
Bits		Bits	
BA=00	calling party address not included	B=0	calling party identity not included
BA=01	calling party address not available	B=0	calling party identity not included
BA=11	calling party address included	B=1 F=1 F=0 and C=1	if General request bit B was 1 if General request bit D was 1 if Calling party number is incomplete and General request bit D was 1
C=0/1	hold provided indicator		discard bit / information (link-by-link acknowledgement)
F=0/1	calling party's category response indicator	A=0/1	calling party category indicator
H=0/1	solicited information indicator		discard bit / information
L=0/1	C-number check response indicator		discard bit / information (Not a subject of interworking. Request cannot be received from TUP2 side)

5.5.1.4. Address complete (ACM)

ISUP2 <=====TUP2

ISUP2		TUP2	
Backward call indicators		Message indicators	
Bits		Bits	
BA=10, FE=00	charge indicator = charge, B-category = no indication	BA=01	address-complete signal, charge
BA=01, FE=00	charge indicator = no charge, B-category = no indication	BA=10	address-complete signal, no charge
BA=00, FE= 10	charge indicator = no indication, B-category = payphone	BA=11	address-complete signal, payphone
DC=00/01	called party's status	C=0/1	subscriber free indicator
N=0/1	echo control device indicator (note)	D=0/1	incoming echo suppressor indicator
	discard bit / information	E=0	call not forwarded
	call diversion information parameter CBA: presentation not allowed GFED: 0000 unknown	E=1	call forwarded
I=1	interworking encountered (No.7 not used all the way)	F=0	signalling path, any path
I=0	no interworking encountered (No.7 used all the way)	F=1	all signalling path No. 7 path
	The following information is generated to ISUP2 side		

HG=00	no end-to-end method		
J=0	no end-to-end information		
K=0	ISUP not used all the way		
L=0	not used		
M=0	terminating access non-ISDN		
PO=00	SCCP method (no indication)		

Note: For echo control procedure, see section 4.3.1.2.

5.5.1.5. Answer (ANM in ISUP2, ANU in TUP2)

ISUP2<=====TUP2

ISUP2	TUP2
Answer (ANM)	Answer (ANU)

5.5.1.6. Clear-back / Reanswer (SUS and RES in ISUP2, CBK and ANU in TUP2)

5.5.1.6.1. Action at non-tariff determining point

ISUP2<=====TUP2

ISUP2	TUP2
Suspend (network) (SUS)	Clear-back (CBK)
Resume (network) (RES)	Answer (ANU)

5.5.1.6.2. Action at tariff determining point

ISUP2<=====TUP2

ISUP2	TUP2
Suspend (network) (SUS)	Clear-back (CBK)
Resume (network) (RES)	Answer (ANU)

- Clear-back from the TUP2 side starts the timer Td, if it expires the ISUP2 side sends REL message.
- Reanswer (ANU) from the TUP2 side stops the timer.

5.5.1.7. Metering pulse message (MPM in ISUP2 and TUP2)

ISUP2<=====TUP2

ISUP2	TUP2
MPM message - Tariff type -- bits DCBA = 0000.. 1110 - Number of metering pulses -- bits 4321 = 0001..1111	MPM message - Tariff type -- bits DCBA = 0000.. 1110 - Number of metering pulses -- bits DCBA = 0001..1111

Note: Tariff type DCBA=1111 (AOC indicator) from TUP2 side, see subsection 5.5.3.13.

5.5.2. Call release and failures

5.5.2.1. From ISUP2 side

ISUP2=====>TUP2

ISUP2	TUP2
-------	------

REL	CLF
RSC	CLF
GRS	CLF
CGB (hardware)	CLF

5.5.2.2. From TUP2 side

The next table is valid if in the Network specific facility parameter the value of "Announcement capability indicator inclusion" is one in the incoming IAM message, or the exchange has not the minimum announcement capability. If this value is zero and the exchange has the minimum announcement capability the exchange sends backward direction some announcement depending on the incoming message from the TUP2 side. Before announcement sending the exchange has to send ACM to ISUP2 side.

ISUP2 <===== TUP2

ISUP2	TUP2
REL message with Location = 10 (beyond an interworking point) and with cause value	
16	FRL
42	SEC
34	CGC
28	ADI
31	CFL
17	SSB
1	UNN
27	LOS
4	SST
88	ACB
65	DPN
22	SNC
47	CON
20	EUM (subscriber absent)
31	RSC (note)
31	GRS (note)
31	HGB (note)

Note: Received after receipt of any backward signal

5.5.3. Reaction for supplementary services

5.5.3.1. UUS

5.5.3.1.1. UUS1 implicit

User-to-user information is discarded. The ISDN access indicator in the backward call indicators parameter in the ACM-message is sent to "terminating access non-ISDN", and by means of that information the originating exchange can notify, that the user-to-user information is discarded. The call continues according to the basic call procedures.

5.5.3.1.2. UUS1 explicit, non-essential

User-to-user information is discarded. The user-to-user indicators parameter in the ACM-message contains the indication "service 1 not provided". The call continues according to the basic call procedures.

5.5.3.1.3. UUS2, non-essential

The user-to-user indicators parameter in the ACM-message contains the indication "service 2 not provided". The call continues according to the basic call procedures.

5.5.3.1.4. UUS3, non-essential, requested during call set-up

The user-to-user indicators parameter in the ACM-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.5.3.1.5. UUS3, non-essential, requested after call set-up

The user-to-user indicators parameter in the FRJ-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.5.3.2. CLIP/CLIR

Send calling party number and set "Address indicator" bit c = (depending on CLIP/CLIR)

5.5.3.3. CUG

The incoming CUG information is transferred unchanged to the CUG information of IAI message.

5.5.3.4. COLP/COLR

If a request is included in the received IAM (bit H = 1 of connected line request indicator in the optional forward call indicator parameter), the answer message is sent with the connected number parameter with indicator address not available.

- Connected number parameter
- nature of address indicator:
000 0000
- numbering plan indicator:
000
- address presentation restricted indicator:
0 (address not available)
- screening indicator:
11 (network provided)

5.5.3.5. SUB

The subaddress is discarded.

5.5.3.6. TP

The suspend/resume messages are discarded.

5.5.3.7. MCID

ISUP2<=====TUP2

ISUP2	TUP2
- INR bit H malicious call identification request indicator - INR bit B holding indicator - EHL	- GRQ bit D malicious call identification indicator - HLD - EHL

ISUP2=====>TUP2

ISUP2	TUP2
-------	------

- INF bits BA calling party address response indicator	- GSM bit F malicious call identification indicator
--	---

5.5.3.8. Call diversion services

ISUP2=====>TUP2

ISUP2	TUP2
IAM message - Redirection information parameter -- bits KJI = xxx redirection counter - Redirecting number parameter	IAI message - Network capability or user facility information indicator -- bits CBA = xxx redirection counter - Original called address (The last redirecting number)

ISUP2<====TUP2

ISUP2	TUP2
ACM message call diversion information parameter CBA: presentation not allowed GFED: 0000 unknown	ACM message - Message indicators -- bit E = 0/1 call forwarding indicator

The ACM-message received from TUP2 side, concerning the diversion of the call (bit E = 1), is transferred backwards to ISUP2 side in ACM-message in parameter "Call diversion information parameter" (bits CBA = 000 and GFED = 0000).

In case the call is diverted in ISUP2/TUP2 boundary exchange, and the ACM-message is received from TUP2 side, the CPG-message containing appropriate diverting or alerting information is generated and sent to ISUP2 side.

5.5.3.9. CW

Not applicable

5.5.3.10. CH

Not applicable

5.5.3.11. CONF

Not applicable

5.5.3.12. 3TPY

Not applicable

5.5.3.13. AOC

ISUP2<====TUP2

ISUP2	TUP2

MPM message - Tariff type parameter -- bit E = 1 AOC info	MPM message - Tariff type parameter -- bits DCBA = 1111 AOC info
---	--

5.6. Interworking of TUP2 to ISUP2

5.6.1 Successful call set-up

5.6.1.1 Initial address message (IAI in TUP2, IAM in ISUP2)

5.6.1.1.1 Calling party category

TUP2 / IAI		ISUP2 / IAM	
00 0000	unknown	0000 0000	unknown
00 1001	national operator	0000 1001	national operator
00 1010	ordinary calling subscriber	0000 1010	ordinary calling subscriber
00 1011	calling subscriber with priority	0000 1011	calling subscriber with priority
00 1100	data call	0000 1100	data call
00 1101	test call	0000 1101	test call
00 1110	payphone	0000 1110	payphone
00 1111	conference device	0000 1111	conference device
01 0000	alarm device	0001 0000	alarm device
01 0001	payphone type2	1110 0000	payphone type2
01 0010	payphone type3	1110 0001	payphone type3
01 0011	payphone type4	1110 0010	payphone type4
01 0100	PBX-subscriber type1	1110 0011	PBX-subscriber type1
01 0101	PBX-subscriber type2	1110 0100	PBX-subscriber type2
01 0110	PBX-subscriber type3	1110 0101	PBX-subscriber type3
01 0111	PBX-subscriber type4	1110 0110	PBX-subscriber type4

5.6.1.1.2 Message indicators (IAI)

TUP2		ISUP2	
Message indicators		Nature of address indicator	
Bits BA, Nature of address indicator			
00	subscriber number	000 0001	subscriber number
01	address including national or international network operator number	000 0010	unknown carrier access code is loaded to "Transit network selection" parameter.
10	national significant number	000 0011	national significant number
11	international number	000 0100	international number
Bits DC, nature of circuit indicator		Nature of connection indicators	
DC = 00	no satellite circuit in the connection	BA = 00	no satellite circuit in the connection
DC = 01	satellite circuit in the connection	BA = 01	one satellite circuit in the connection
Bit G, echo suppressor indicator		Nature of connection indicators	
G=0	outgoing half echo control device not included	E=0	outgoing half echo control device not included
G=1	outgoing half echo control device included	E=1	outgoing half echo control device included

Bit H, incoming international call indicator		Forward call indicators	
H=0	call other than incoming international call	A=0	call to be treated as a national call
H=1	incoming international call indicator	A=1	call to be treated as an international call
Bit J, all-digital-path-required indicator		Transmission medium requirement	
J=0	ordinary call	0000 0011	3.1 kHz audio
J=1	digital path required	0000 0010	64 kbit/s unrestricted
Bit K, signalling path indicator		Forward call indicators	
K=0	no indication	D=1	interworking encountered
K=1	all signalling system No.7 path	D=0	no interworking encountered
Bit L, announcement capability indicator		Network specific facility	
L=0	no indication	octet2 bit4=0	announcement capability info not included
		octet2a bit7=0	no announcements available,default value
L=1	announcement capability	octet2 bit4=1	announcement capability info included
		octet2a bit7=1	announcements available

5.6.1.1.3 First indicator octet (IAI)

TUP2		ISUP2	
First indicator octet			
Bit A, network capability or user facility information indicator		Network specific facility	
0	network capability or user facility information indicator not included		Not applicable
1	network capability or user facility information indicator included		Network specific facility type octet 2 bit 1 = 1, and octet 2a bits 4321 language indicator according to bits HGFE Redirection information parameter bits KJI is set according to bit CBA, if the call is redirected.
Bit B, closed user group information indicator		Optional forward call indicator	
0	closed user group information not included		Not applicable
1	closed user group information included		Bits BA according to "CUG call indicator in TUP and "Closed user group interlock code parameter field "according to TUP coding.

Bit C, additional calling party information indicator		Location number	
0	additional calling party information not included		Not applicable
1	<p>additional calling party information included.</p> <p>- additional information indicator bits DCBA</p> <p>0001 NMT 450</p> <p>0010 NMT 900</p> <p>0011 GSM</p> <p>0100 Autonet</p> <p>- number of information octets HGFE</p> <p>- additional information for calling <u>party</u>.</p> <p>note: TUP2 does not carry all the information that can be carried by ISUP2</p>		<p>Nature of address indicator</p> <p>bits 765 4321</p> <p>111 1100 NMT 450</p> <p>111 1101 NMT 900</p> <p>111 1110 GSM</p> <p>111 1011 Autonet</p> <p>- Not applicable</p> <p>- Address signals according to TUP2 information</p> <p>Numbering plan indicator</p> <p>- 110 national numbering plan</p> <p>Address presentation restricted indicator</p> <p>- 01 presentation restricted</p> <p>Screening indicator</p> <p>- 11 network provided</p>
Bit E, calling line identity indicator		Calling party number	
0	calling line identity not included		Not applicable

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party¶

1	calling line identity included Calling line identity field bits BA nature of address ind. 10 national significant number 11 international number bit C calling line identity presentation indicator 0 calling line identity presentation not restricted 1 calling line identity presentation restricted bit D incomplete calling line ind. 0 no indication 1 incomplete calling line identity bits DCBA number of address signals Calling line identity		Nature of address indicator bits 765 4321 000 0011 nat. significant number 000 0100 international number Address presentation restricted indicator 00 presentation allowed 01 presentation restricted Calling party incomplete indicator 0 complete 1 incomplete Not applicable Address signals according to TUP2 information
Bit F, original called address indicator		Original called number	
0	original called address not included		Not applicable
1	original called address included Original called address field bits BA address indicator 10 national significant number 11 international number bit C calling line identity presentation indicator 0 original called address presentation not restricted 1 original called address presentation restricted bits DCBA number of address signals Calling line identity		Nature of address indicator bits 765 4321 000 0011 nat. significant number 000 0100 international number Address presentation restricted indicator 00 presentation allowed 01 presentation restricted Not applicable Address signals according to TUP2 information

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5.6.1.2 General request message / Information request (GRQ in TUP2 and INR in ISUP2)

TUP2 <===== ISUP2

TUP2		ISUP2	
General request		Information request indicators	
Bits		Bits	
B=1	calling party address request indicator	A=1	calling party address indicator
Send "holding request message" (HLD)		B=1	holding request
A=1	calling party's category request indicator	D=1	calling party's category request
D=1	MCID request	H=1	MCID request
	Discard information	L=1	C-number check request

5.6.1.3 General forward set-up information message / Information (GSM in TUP2 and INF in ISUP2)

TUP2 =====> ISUP2

TUP2	
Bit A = 1 calling party category included	- Information indicators bit F = 1 and "Calling party's category" is according to TUP2 information
Bit B = 1 calling line identity included	- Information indicators bit BA = 11 and "Calling party number" is according to TUP2 information
Bit C = 1 incoming trunk and transit exchange identity included	- Identity of the incoming trunk circuit and transit exchange is coded according to TUP2 information
Bit F = 0 MCID is not included	- Information indicators bit BA = 00 (calling party address not included)
Bit F = 1 MCID is included	- Information indicators bit BA = 11 and Calling party number"parameter is according to TUP2 information

Deleted: - If in INR-message bit H was 1, in the INF-message the information indicators bit C = 1 else it is 0??????????

5.6.1.4 Address complete message (ACM)

TUP2 <===== ISUP2

TUP2	ISUP2
Bits BA = 01 address complete charge Bits BA = 10 address complete no charge Bits BA = 11 address complete payphone Bit C = 0 called party's status no indication Bit C = 1 called party's status subscriber free Bit C = 0 called party's status no indication Discard information Bit D = 1 incoming half echo suppressor included	- Backward call indicator bits BA = 00, 01 (note), 10, 11 bits BA = 01 (note) bits BA = xx + bits FE=10 bits DC = 00 bits DC = 01 bits DC = 10 connect when free bits FE, J, K, M = xx,x,x,x (note: if FE=10 see the handling of BA above) bit N = 1
Discard parameter	- Optional backward call indicator
Discard parameter	- Cause indicators
Discard parameter	- User-to-user indicators
Discard parameter	- User-to-user information

Discard parameter	- Access transport
Bit E = 1 call forwarded Discard information	- Generic notification indicator -- 111 1011 call is diverting -- other values
Discard parameter	- Transmission medium used
See section 4.3.2.	- Echo control information -- bits DC = 10 incoming half echo control device included -- bits FE = 01 outgoing half echo control device activation request -- other values
Discard parameter	- Access delivery information
Discard parameter	- Redirection number
Discard parameter	- Call diversion information
Discard parameter	- Network specific facility
Discard parameter	- Redirection number restriction

NOTE: If there is a need to extend calls of no charge to the area of several network operators the operators must agree the method of application of the indicator.

5.6.1.5 Answer message (ANU in TUP2 and ANM in ISUP2)

TUP2 <=====ISUP2

TUP2	ISUP2
ANU	ANM discard all optional parameters

5.6.1.6 Connect message (ACM and ANU in TUP2 and CON in ISUP2)

TUP2 <=====ISUP2

TUP2	ISUP2
ACM and ANU	CON See parameter handling from point 5.6.1.4 ACM

5.6.1.7 Metering pulse message (MPM)

TUP2 <=====ISUP2

TUP2	ISUP2
MPM Tariff type - bits DCBA = 0000..0101 =0000 =0111 =0000 =1001...1011 =0000 - bits DCBA = 1111 Number of metering pulses - bits DCBA = 0001..1111	MPM Tariff type - bits DCBA = 0000..0101 =0110 =0111 =1000 =1001...1011 =1100 - bit E = 1 Number of metering pulses - bits 4321 = 0001..1111

5.6.1.8 Charge message (CHG)

CHG-messages received from the outgoing ISUP2-side are converted to MPM messages. In the conversion the values shall be brought down to a round figure. The MPM messages are sent to incoming side when charging begins i.e. ANU message is received from outgoing side.

The CHG-messages are acknowledged with the CHGA-message normally using indication "tariff accepted by interworking or originating exchange". If the received tariff is not within agreed limits or if it can not be converted into meter pulses, the indication "tariff not accepted by interworking or originating exchange" is used in the CHGA message.

5.6.1.9 Suspend/resume (network initiated) (CBK/ANU in TUP2 and SUS/RES in ISUP2)

Deleted: 8

5.6.1.9.1 Action at non-tariff determining point

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TUP2 <=====ISUP2

TUP2	ISUP2
CBK/ANU	SUS/RES

Suspend from the ISUP2 side starts the timer Tf. If Tf expires, FRL message is sent to the TUP2 side, and REL message to the ISUP2 side. Resume (RES) from the ISUP2 side stops the timer.

5.6.1.9.2 Action at tariff determining point

Deleted: 8

Suspend from the ISUP2 side starts the timer Td in the charging point. No CBK-message is sent to the TUP2 side and charging takes place during the 'Clear back' -condition. If Td expires, FRL message is sent to the TUP2 side, and REL message to the ISUP2 side. Resume (RES) from the ISUP2 side stops the timer Td.

5.6.1.10 Suspend/resume (user initiated) (SUS/RES in ISUP2)

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Discard message

5.6.2 Call release and failures

5.6.2.1 Normal release from TUP2 side (CLF)

TUP2 =====>ISUP2

TUP2	ISUP2
CLF	REL message with cause 31 normal unspecified Location 10 beyond an interworking point

5.6.2.2 Normal release from ISUP2 side (REL)

TUP2 <=====ISUP2

TUP2	ISUP2
FRL	REL discard all optional parameters

5.6.2.3 Abnormal release from ISUP2 side

The next table is valid if the bit L (announcement capability) is one in the incoming IAI message, or the exchange has not the minimum announcement capability. If value of bit L is zero and the exchange has the minimum announcement capability the exchange sends backward direction some announcement depending on the incoming message from the ISUP2 side. Before the announcement the exchange has to send ACM to TUP2 side.

TUP2 <=====ISUP2

TUP2	ISUP2
SEC	REL message with cause 42
CGC	34
ADI	28
CFL	18, 21, 29, 31, 41, 95
SSB	17
UNN	1, 2, 5
LOS	27
SST	4, 97, 99, 111, 127
ACB	53, 55, 87, 88, 90
DPN	65
SNC	22
CON	44, 47, 58
EUM (not reachable)	20
FRL	16, 19
After the first backward message but before the ACM-message received from ISUP2 side	
CFL	RSC, GRS, CGB (hardware)
After the ACM-message received from ISUP2 side	
FRL	RSC, GRS, CGB (hardware)

5.6.2.4 Abnormal release from TUP2 side

TUP2 =====>ISUP2

TUP2	ISUP2
RSC, GRS, HGB	REL message with cause 31 normal unspecified Location 10 beyond an interworking point

5.6.3 Reaction for supplementary service

5.6.3.1 UUS

5.6.3.1.1 UUS1 implicit

Not applicable

5.6.3.1.2 UUS1 explicit, non-essential

Not applicable

5.6.3.1.3 UUS2, non-essential

Not applicable

5.6.3.1.4 UUS3, non-essential, requested during call set-up

Not applicable

5.6.3.1.5 UUS3, non-essential, requested after call set-up

The user-to-user indicators parameter in the FRJ-message contains the indication "service 3 not provided". The call continues according to the basic call procedures.

5.6.3.2 CLIP/CLIR

Send calling party number and set "Address presentation restricted indicator" depending on CLIP/CLIR

5.6.3.3 CUG

The incoming CUG information is transit unchanged to the CUG information of IAM message.

5.6.3.4 COLP/COLR

Not applicable

5.6.3.5 SUB

Not applicable

5.6.3.6 TP

The suspend/resume messages (user initiated) are discarded.

5.6.3.7 MCID

TUP2<=====ISUP2

TUP2	ISUP2
- GRQ bit D malicious call identification - HLD - EHL	- INR bit H malicious call identification request indicator - INR bit B holding indicator - EHL

TUP2 =====>ISUP2

TUP2	ISUP2
- GSM bit F malicious call identification indicator	- INF bits BA calling party address response indicator

5.6.3.8 Call diversion services

TUP2 =====>ISUP2

TUP2 IAI-message	ISUP2 IAM-message
- Network capability or user facility information indicator -- If bits CBA = 1 redirection counter -- Original called address -- If bits CBA = 2...5 redirection counter -- Original called address	- Redirection information parameter -- bits KJI = 1 redirection counter -- Original called address = according to TUP -- Redirecting number = original called address -- bits KJI = 2...5 redirection counter -- Original called address = empty -- Redirecting number = Original called address

The ACM-message received from ISUP2 side with the parameter "Call diversion information parameter" and / or with call diversion may occur (bit B=1) in optional backward call indicators parameter and / or with

notification indicator is call is diverting in generic notification parameter, then the information is transferred backwards to TUP1-side in the ACM-message in (bit E = 1).

In case the call is diverted in TUP2/ISUP2 boundary exchange, and the ACM-message is received from ISUP2 side, it is discarded without any notification.

5.6.3.9 CW

Not applicable

5.6.3.10 CH

Not applicable

5.6.3.11 CONF

Not applicable

5.6.3.12 3TPY

Not applicable

5.6.3.13 AOC

TUP2 <=====ISUP2

TUP2	ISUP2
MPM Tariff type parameter - bits DCBA = 1111 AOC inf.	MPM Tariff type parameter - bit E = 1 AOC inf.

5.7. Interworking of ISUP2 to ISUP1

5.7.1 Successful call set-up

5.7.1.1 Initial address message (IAM)

5.7.1.1.1 Called party number

The transit network selection parameter including the operator code (national or international carrier access code) and the called party number parameter including nature of address indicator 000 0011 (national significant number) or 000 0100 (international number) and the address digits received from ISUP2 side are transferred to ISUP1 side as follows:

Nature of address indicator in called party number parameter is set to value 000 0010 (address including national or international carrier access code) and the address digits include the operator code and the called party address digits.

In other cases the called party number is transferred to ISUP1 side as such.

Address signals reserved for operators' internal use (values 1101 and 1110) are transferred to ISUP1-side in case it is possible to continue the call connection without interpreting these values. In other cases the call is released.

5.7.1.1.2 Forward call indicators

Bits HG: ISDN user part preference indicator

Indicator value HG=00, ("ISDN user part preferred") from ISUP2-side is interpreted and transferred to ISUP1-side as HG=01 ("ISDN user part not required all the way").

Bits PO: Outgoing call barring indicator; indicator (from ISUP2-side) is discarded.

5.7.1.1.3 Calling party's category

The calling party categories received from ISUP2 side are transferred to ISUP1 side as such except the following categories:

ISUP2		ISUP1	
IAM		IAM	
1110 0000	payphone type2	0000 1110	payphone
1110 0001	payphone type3	0000 1110	payphone
1110 0010	payphone type4	0000 1110	payphone
1110 0011	PBX-subscriber type1	0000 1010	ordinary calling subscriber
1110 0100	PBX-subscriber type2	0000 1010	ordinary calling subscriber
1110 0101	PBX-subscriber type3	0000 1010	ordinary calling subscriber
1110 0110	PBX-subscriber type4	0000 1010	ordinary calling subscriber

5.7.1.1.4 Calling party number

Address signals reserved for operators' internal use (1101 and 1110) are transferred to ISUP1-side. The address presentation marked restricted is transferred as such.

5.7.1.1.5 Optional forward call indicators

Bit C "Simple segmentation indicator" is defined spare in ISUP1.

Coding C=1 shall be discarded by ISUP1.

5.7.1.1.6 User teleservice information

The high layer compatibility information (HLC) received from ISUP2-side is transferred onwards in both the access transport parameter and user teleservice information parameter..

5.7.1.1.7 Redirection Information

When the Redirection counter of ISUP2 is set to one, the Redirection Information parameter shall be transferred to ISUP1 with omitting the second octet (ie the length of the parameter is set to one). The value of the Original redirection reasons (ISUP1) shall be set according to the Redirecting reason of ISUP2.

5.7.1.1.8 Following parameters are not defined in ISUP1 side and shall be discarded.

Generic number
 Propagation delay counter
 User service information prime
 Network specific facility
 Remote operations
 Parameter compatibility information
 Generic notification
 Service activation
 Transmission medium requirement prime
 Location number

5.7.1.2 Address complete message (ACM)

All information received from ISUP1 side is transferred to ISUP2 side as such.

5.7.1.3 Call progress message (CPG)

All information received from ISUP1 side is transferred to ISUP2 side as such.

5.7.1.4 Answer message (ANM)

All information received from ISUP1 side is transferred to ISUP2 side as such.

5.7.1.5 Connect message (CON)

All information received from ISUP1 side is transferred to ISUP2 side as such.

5.7.1.6 Metering pulse message (MPM)

On receipt MPM-message from ISUP1 side there are two possibilities to transmit the charging information to ISUP2 side:

- a) to repeat the received MPM-message as such, or
- b) to send CHG-message with optional parameter "one-time charge", in which the charge of "number of metering pulses" -parameter of received MPM-message is coded in as follows:

CBA	Multiplier
000	10^{-3}
110	10^{+3}
MLKJIHGFED	Current amount
0000000000	0 p
.	.
.	.

1111100111 999 p

The sending exchange puts its own signalling point code in the CHG-message.

Those values of the tariff type parameter in MPM-message not including in the corresponding parameter of CHG-message, are coded as "tariff type not indicated".

5.7.2 Call release and call failures

REL-message from ISUP2 side to ISUP1 side is transferred as such except following parameters which are discarded.

- Network specific facility
- Access delivery information
- Parameter compatibility information
- Redirection number restriction
- User-to-user indicators

REL-message from ISUP1 side to ISUP2 side is transferred as such.

5.7.3 Reaction for supplementary services

5.7.3.1 UUS

5.7.3.1.1 UUS1

User information received in SGM-message from ISUP2 side is discarded.
User-to-user indicator parameter received from ISUP2 side is discarded.

5.7.3.1.2 UUS2

5.7.3.1.3 UUS3

User-to-user information is transferred as such in both direction.

5.7.3.2 CLIP/CLIR

CLIP/CLIR information received from ISUP2 side is transferred as such.

5.7.3.3 CUG

CUG information received from ISUP2 side is transferred as such.

5.7.3.4 COLP/COLR

COLP-request received from ISUP2 side in optional forward indicator parameter with bit H (H=1) is transferred to ISUP1 side as such.

COLR- information (with presentation allowed/restricted information) parameter received from ISUP1 side is transferred to ISUP2 side as such.

5.7.3.5 SUB

The called party subaddress, received in access transport parameter, is transferred forward as such.

5.7.3.6 TP

On receipt of the SUS- or RES-message it is transferred onwards as such.

5.7.3.7 MCID

All messages (INR, INF, EHL, EHA) concerning the malicious call identification are transferred onwards as such.

5.7.3.8 Call diversion services

The CPG-message received from ISUP1 side, concerning the diversion of a call, is transferred backwards to ISUP2 side as such.

In case the call is diverted in ISUP2/ISUP1 boundary exchange, and the ACM-message is received from ISUP1 side, the CPG-message containing appropriate (diverting or alerting) information is generated and sent to ISUP2 side.

5.7.3.9 CW

The call waiting information received in backward call indicators -parameter (called party's status indicator DC=10, "connect when free") of ACM-message from ISUP1 side is discarded and the call continues as a normal call.

5.7.3.10 CH

The call hold information received in information indicator -parameter (information indicators ED=01/10, "call hold"/"call in active state") of INF-message from ISUP1 side is discarded and the call continues as a normal call.

5.7.3.11 CONF

The CPG-message from ISUP2 side, containing the generic notification parameter concerning the conference supplementary service, is discarded. The call continues according to the basic call control procedures.

5.7.3.12 3PTY

The CPG-message from ISUP2 side, containing the generic notification parameter concerning the 3-party supplementary service, is discarded. The call continues according to the basic call control procedures.

5.8. Interworking of ISUP1 to ISUP2

5.8.1 Successful call set-up

5.8.1.1 Initial address message (IAM)

5.8.1.1.1 Calling party's category

The calling party categories received from ISUP1 side are transferred to ISUP2 side as such.

5.8.1.1.2 Called party number

The called party number -parameter received from ISUP1 side including nature of address indicator 000 0010 (address including national or international carrier access code) and the address digits are transferred to ISUP2 side as follows:

Nature of address indicator in called party number parameter is set to value 000 0011 (national significant number) or 000 0100 (international number) and the address digits include the called party address digits without the operator code. The operator code (national or international carrier access code) is transferred in the transit network selection parameter.

In other cases the called party number is transferred to ISUP2 side as such.

5.8.1.1.3 Access transport

The high layer compatibility information (HLC) included in the access transport parameter received from ISUP1 side is transferred to ISUP2 side in both the user teleservice information parameter and the access transport parameter.

5.8.1.1.4 Redirection Information

When the Redirection Information parameter of ISUP1 includes only the first octet, the parameter shall be transferred to ISUP2 with the following interworking modifications:

- 1) Length of the parameter shall be set to two
- 2) Redirection counter shall be set to one
- 3) Redirecting reason shall be set according to Original redirection reasons

5.8.1.1.5 Other parameters of IAM-message

All other parameters received in IAM-message from ISUP1 side are transferred to ISUP2 side as such.

5.8.1.2 Information request (INR)

INR-message from ISUP2 side is transferred as such except possible optional parameters "Network specific parameter" and "Parameter compatibility information," which are discarded.

5.8.1.3 Address complete (ACM)

ACM-message from ISUP2 side is transferred to ISUP1 side as such with following exceptions.

Following parameters are discarded:

- Transmission medium used
- Echo control information
- Access delivery information

- Redirection number
- Parameter compatibility information
- Call diversion information
- Network specific facility
- Remote operations
- Service activation
- Redirection number restriction

Generic notification indicator parameter containing following codes for notification indicator (1100000) see 5.8.3.9. In other cases it is discarded.

5.8.1.4 Call progress (CPG)

CPG-message from ISUP2 side is transferred to ISUP1 side as such with following exceptions.

Following parameters are discarded:

- Network specific facility
- Remote operations
- Transmission medium used
- Access delivery information
- Parameter compatibility information
- Call diversion information
- Service activation
- Redirection number restriction
- Generic notification indicator parameter

5.8.1.5 Answer (ANM)

On receipt of ANM-message from ISUP2 side it is transferred to ISUP1 side as such.

5.8.1.6 Connect (CON)

On receipt of CON-message from ISUP2 side it is transferred to ISUP1 side as such.

5.8.1.7 Metering pulse message (MPM)

MPM-message from ISUP2-side is normally transferred backwards to ISUP1-side as such. However, if the AOC-indicator of the message has the value E=1 ("information can be used only for advice of charge supplementary service, not for call charging purposes"), the message is discarded.

5.8.1.8 Charge message (CHG)

When CHG-message is received from the outgoing (ISUP2)-side it is either acknowledged with CHGA-message or transferred onwards, depending on the ISUP-version used at the opposite end of the incoming connection. CHG-message is only sent, when the receiving ISUP-version is able to accept it (route parameter is utilized at the sending end). If the CHG-message is not sent onwards, the MPM-messages are sent to incoming side when charging begins, i.e. ANM- or CON-message is received from outgoing side.

If the received CHG-message contains an AOC-indicator, the CHG-message is acknowledged by a CHGA-message containing the indication "tariff not accepted by interworking or originating exchange".

5.8.1.9 Suspend/resume (network initiated) at tariff determining point

Suspend (SUS/network) from the ISUP2 side starts the timer T6 in the charging point. No SUS message is sent to the ISUP1 side and charging takes place during the 'Clear back' -condition. If T6 expires, REL-message is sent to the ISUP1 side and another REL-message to the ISUP2 side. Resume (RES/network) from the ISUP2 side stops the timer T6.

5.8.2 Call release and call failure

See 5.7.2

5.8.3 Reaction for supplementary services**5.8.3.1 UUS****5.8.3.1.1 UUS1**

User information received in SGM-message from ISUP2 side is discarded. User-to-user indicator parameter received from ISUP2 side is discarded.

5.8.3.1.2 UUS2**5.8.3.1.3 UUS3**

User-to-user information is transferred as such in both directions.

5.8.3.2 CLIP/CLIR

CLIP/CLIR information received from ISUP2 side is transferred as such.

5.8.3.3 CUG

CUG information received from ISUP2 side is transferred as such.

5.8.3.4 COLP/COLR

COLP-request received from ISUP2 side in optional forward indicator parameter with bit H=1 is transferred to ISUP1 side as such.

COLR-information (with presentation allowed/restricted information) parameter received from ISUP2 side is transferred to ISUP1 side as such.

5.8.3.5 SUB

The called party subaddress, received in access transport parameter, is transferred forward as such.

5.8.3.6 TP

On receipt of SUS- or RES-message it is transferred onwards as such.

5.8.3.7 MCID

All messages (INR, INF, EHL, EHA) concerning the malicious call identification are transferred onwards as such.

5.8.3.8 Call diversion services

Information received in parameter "Generic notification indication."

The CPG-message received from ISUP2 side, concerning the diversion of a call, is transferred backwards to ISUP1 side as such.

In case the call is diverted in ISUP1/ISUP2 boundary exchange, and the ACM-message is received from ISUP2 side, the CPG-message containing appropriate (diverting or alerting) information is generated and sent to ISUP1 side.

5.8.3.9 CW

The call waiting information received in generic notification indicator -parameter (notification indicator = 110 0000, "call is waiting call") of ACM-message from ISUP2 side is discarded and the call continues as a normal call.

5.8.3.10 CH

The call hold information received in generic notification indicator -parameter of CPG-message (generic notification indicator = 1111001/111 1010, "remote hold"/"remote retrieval") from ISUP2 side is discarded and the call continues as a normal call.

5.8.3.11 CONF

The CPG-message from ISUP2 side, containing the generic notification parameter concerning the conference supplementary service, is discarded. The call continues according to the basic call control procedures.

5.8.3.12 3PTY

The CPG-message from ISUP2 side, containing the generic notification parameter concerning the 3-party supplementary service, is discarded. The call continues according to the basic call control procedures.

5.9. Interworking of ISUP2 to 2B+D

No remarks for the call set up and the call from ISUP2 to 2B+D. All information, which has to be transferred between 2B+D and ISUP2, is transparent on both sides, except the following cause values.

5.9.1 Cause values

The following interworking is defined for cause values from 2B+D to ISUP2: SFS 5749

ISUP2	<-----	2B+D
31		6
95		81
111		96
111		98
111		100
111		101

The other cause values are transferred transparently from 2B+D to ISUP2.

5.10. Interworking of 2B+D to ISUP2

5.10.1 Normal call set up and call release

In the originating call from 2B+D to ISUP2, all information is transferred transparently between 2B+D and ISUP2, except the following information.

5.10.1.1 Transit network selection

Carrier access code is transferred in called party number parameter field in 2B+D side. When interworking with ISUP2, the operator code (national or international carrier access code) is transferred in transit network selection parameter in IAM-message of ISUP2 and the address digits are transferred in called party number field with nature of address indicator set to value 000 0011 (national significant number) or 000 0100 (international number).

5.10.1.2 Cause values

All other cause values are transferred transparently from ISUP2 to 2B+D side, except the following cause value (SFS 5749).

2B+D	<-----	ISUP2
1		5

5.10.2 Reaction for supplementary services

5.10.2.1 CLIP

In case of PABXs, the calling line number must not be the number for the individual PABX-line. For hunting groups, the common number of that hunting group will be sent as the calling line number.

If the 2B+D lines are used as DDI-lines, see point 5.12.2.1 for the calling line number identification.

5.10.2.2 MCID

In the case of the MCID, according to Finnish standards for N2-signallings, there is no impact to the 2B+D signalling in the originating exchange.

5.10.2.3 AOC

No interworking is needed in pure 2B+D - ISUP2 traffic, but because of existing 2B+D interfaces, which use "charging unit information" for AOC, there is a conversion from CHG-Price-information into "charging unit information" of D-channel protocol needed as an additional option.

The "charging unit information" will be sent in information element "Display". The Display is coded: x.....x UNITS
where x.....x is the number of impulses.

The "charging unit information" is coded as IA5-characters and it can be sent in normal messages during the call, but in the call clearing messages (DISC, REL, REL COMP) only the total number of the impulses for the call is included.

5.11. Interworking of ISUP2 to 30B+D

No remarks for call set up and call release, except cause values, as indicated in subsection 5.9.1. The function is the same as interworking of ISUP2 to 2B+D.

5.12. Interworking of 30B+D to ISUP2

5.12.1 Normal call set up and call release

In the originating call from 30B+D to ISUP2, the function is the same as interworking of 2B+D to ISUP2. See subsection 5.10.1.

5.12.2 Reaction for supplementary services

5.12.2.1 CLIP

The calling party number in IAM depends on the information, which is received over 30B+D.

Normally only the last digits (in case of PABX: the PABX-number, extension number) are sent over 30B+D. The interworking point has to add the missing digits (the DDI-number) to supplement the last digits into the "complete" calling number with screening indicator:

11 network provided.

If no digits or incomplete calling line number is received over 30B+D, the interworking point has to generate the operator number (DDI+"x" in case of PABX, normally x=1) of that interface with screening indicator:

11 network provided.

If the complete calling number is received over the 30B+D, it will be transferred transparently to ISUP2 with screening indicator:

01 user provided, verified and passed.

In all of these cases the "calling party number incomplete indicator" is set to "0" complete.

6. INAP and ISUP2 interworking (interaction)

6.1 Scope of the INAP - ISUP2 interworking section

For the INAP - ISUP2 interworking the ETSI document ETR 164 shall apply unless some changes or additions are made on the below section 6.2.

Deleted: DTR/SPS-1006 (draft at the moment)

6.2 Changes to the ETR 164

In general, although not always explicitly mentioned, on the references to the Q.76x specifications, the national specification SFS 5779 shall have precedence (parameter codings, timers, etc.).

§ 5. Description

Receipt of INAP operations / Table 2

- The influence of operations RequestNotificationCharging and SendChargingInformation is operator specific and therefore out of the scope of this document.

Support of the SCF-SRF relationship / Figures 3 and 4

- On the ISUP connection between the (initiating) SSP and the IP the CorrelationID and ScfID (parameters) information has to be embedded within the address information as far as the ISUP protocol does not carry the corresponding parameters.

§ 7. Coding requirements

§ 7.2 Parameters

This section is not applicable for the interim period of time (i.e. until the parameters defined in this section have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After the parameters are taken into use, no exceptions are foreseen.

§ 9.1.1.1 Forward access signalling

Table 4: Mapping of parameters from IAM to InitialDP

- The national exceptions of the parameters in the IAM message shall be applicable on the corresponding INAP parameters according to the operator specific agreements on the INAP.

§ 9.1.1.1.1 Connect operation

Table 5: Mapping of parameters from Connect to IAM

- The national exceptions of the parameters in the IAM message shall be applicable on the corresponding INAP parameters according to the operator specific agreements on the INAP.
- The value of the ISDN user part indicator depends on the actual situation, as is it not absolutely necessary that both the incoming and outgoing signalling connection uses ISUP:

§ 9.1.1.1.3 Mapping of the INAP serviceInteractionIndicators

When concerning the ISUP parameters this section is not applicable for the interim period of time (i.e. until the parameters mentioned in this section (and in Table 6) have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After the parameters are taken into use, no exceptions are foreseen.

When concerning local actions at the SSP, this section applies already now.

§ 9.1.1.2 SendChargingInformation operation

The contents of this section is operator specific.

§ 9.1.1.3 Address complete or connect message

The text related to the serviceInteractionIndicators parameter is not applicable for the interim period of time (i.e. until the related ISUP parameters have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SF 5779).

After the relevant ISUP parameters are taken into use, no exceptions are foreseen.

§ 9.1.1.6 Continuity check

Not applicable nationally.

§ 9.3.1 General (On detection Point processing)

Table 7. Event Detection Points

- DP 4; handling and definition of the situations mapping to the DP 4 is operator specific.

§ 9.4.1.2 Mapping of the INAP serviceInteractionIndicators

When concerning ISUP parameters this section is not applicable for the interim period of time (i.e. until the serviceInteractionIndicator related parameters handled in this section have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After the parameters are taken into use, no exceptions are foreseen.

When concerning local actions at the SSP this section applies already now.

§ 9.4.1.3 Sending of backward messages

The text related to the serviceInteractionIndicators parameter is not applicable for the interim period of time (i.e. until the serviceInteractionIndicator related parameter have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After the parameters are taken into use, no exceptions are foreseen.

§ 9.4.2.1 Handling of unexpected messages

In item b) the FOT message is not used nationally.

§ 9.4.3.2 Malicious call identification

The IDR and IRS messages are not used nationally. For the MCID procedure, see the national specification SFS 5778.

§ 9.5.2.1.1.1 Establish Temporary Connection

Table 9: Mapping of parameters from EstablishTemporaryConnection to IAM

- The national exceptions of the parameters in the IAM message shall be applicable on the corresponding INAP parameters according to the operator specific agreements on the INAP.

- As long as the CorrelationID and ScfID parameters are not supported by the national ISUP, the corresponding information has to be embedded within the address information according to the operator specific agreements

- serviceInteractionIndicators: see § 9.4.1.2

a) Nature of connection indicators

- Continuity check indicator is not used nationally

b) Forward call indicators

- The value of the ISDN user part indicator depends on the actual situation, as is it not absolutely necessary that also the incoming signalling connection has used ISUP:
- ISDN user part preference indicator shall be set to the value '00' (ISDN user part preferred) as far as the ISUP does not support the transfer of the ServiceInteractionIndicators related parameters and correlationID and scfID (i.e. as far as there is no need for the end-to-end ISUP due to need of transfer ISUP specific parameters). If there are any other reasons requiring ISUP all the way, that request can be followed.

§ 9.5.2.1.1.2 Interworking with an ISUP not supporting the CorrelationID and SCF ID parameters

As long as the CorrelationID and ScfID parameters are not supported by the national ISUP, the corresponding information has to be embedded within the address information according to the operator specific agreements. Also in that case the connection shall fail if this information cannot be carried to the assisting SSP.

§ 9.5.3 Hand-off method -procedure in the initiating SSP

As long as the CorrelationID and ScfID parameters are not supported by the national ISUP, the corresponding information has to be embedded within the address information according to the operator specific agreements.

§ 9.5.4.1.1 Forward address signalling

Table 10: Mapping of parameters from IAM to AssistRequestInstruction

- As long as the CorrelationID parameter is not supported by the national ISUP, the corresponding information has to be embedded within the address information according to the operator specific agreements

§ 9.6 Call gapping

b)

The use of display information in case the REL message has to be sent to the incoming link is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779). If the actions are local (i.e. the subscriber is connected to the SSP) no exceptions exist.

After the ISUP parameter is taken into use, no exceptions are foreseen.

§ 9.7 Service filtering

b)

The use of display information in case the REL message has to be sent to the incoming link is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779). If the actions are local (i.e. the subscriber is connected to the SSP) no exceptions exist.

After the ISUP parameter is taken into use, no exceptions are foreseen.

§ 9.8.1.1.1 Continue operation

Table 11: Mapping of parameters from InitiateCallAttempt to IAM

- The national exceptions of the parameters in the IAM message shall be applicable on the corresponding INAP parameters according to the operator specific agreements on the INAP.
- serviceInteractionIndicators: see

a) Nature of connection indicators

- Continuity check indicator is not used nationally

b) Forward call indicators

- The value of the ISDN user part indicator depends on the actual situation, as is it not absolutely necessary that also the incoming signalling connection has used ISUP:
- ISDN user part preference indicator shall be set to the value '00' (ISDN user part preferred) as far as the ISUP does not support the transfer of the ServiceInteractionIndicators related parameters (i.e. as far as there is no need for the end-to-end ISUP due to need of transfer ISUP specific parameters). If there are any other reasons requiring ISUP all the way, that request can be followed.

§ 9.9.1.1.1 Address complete, call progress, connect or answer message

The text concerning the conference treatment indicator parameter is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After this parameter has been taken into use, no exceptions are foreseen.

§ 9.9.2.1.1 Forward address signalling

The text concerning the conference treatment indicator, call diversion treatment indicator and called IN number parameters is not applicable for the interim period of time (i.e. until the parameters mentioned in this section have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After these parameters have been taken into use, no exceptions are foreseen.

§ 9.9.2.1.1. Preventing of call offering for calls not routed via IN at a destination access

The text concerning the call to be offered parameter is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779).

After this parameter has been taken into use, no exceptions are foreseen.

§ 11 Interaction between IN basic call and ISDN supplementary services

In general, the national specification SFS 5778 on the ISDN supplementary shall apply.

§ 11.1.2 (Call diversion) Actions in the destination local exchange

The text concerning the call diversion treatment indicator parameter is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779). Therefore the handling of the IN and ISDN call diversion service interaction in local exchanges during this interim period of time is an operator dependent matter.

After this parameter has been taken into use, no exceptions are foreseen.

§ 11.4.1 (Conference) Action in the origination or destination local exchange

The text concerning the conference treatment indicator parameter is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779). Therefore the handling of the IN and ISDN conference service interaction in local exchanges during this interim period of time is an operator dependent matter.

After this parameter has been taken into use, no exceptions are foreseen.

§ 11.7.1 (Malicious call identification) Actions in the service switching point

The IDR and IRS messages are not used nationally.

§ 11.7.2 (Malicious call identification) Actions in the destination local exchange

The text concerning the called IN number and charged party identification parameters is not applicable for the interim period of time (i.e. until these parameters have been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779). Therefore the handling of the IN and ISDN MCID service interaction in local exchanges during this interim period of time is an operator dependent matter.

After these parameters have been taken into use, no exceptions are foreseen.

The IRS message is not used nationally.

§ 11.8.1 (Three party) Actions in the originating or destination local exchange

The text concerning the conference treatment indicator parameter is not applicable for the interim period of time (i.e. until this parameter has been accepted to the ITU-T Q.76x specifications and after that accepted in the national SFS 5779). Therefore the handling of the IN and ISDN Three party service interaction in local exchanges during this interim period of time is an operator dependent matter.

After this parameter has been taken into use, no exceptions are foreseen.

7. GSM and ISUP2 interworking (interaction)

7.1. ANM, CON messages

If the connected party number is included, the connected number parameter is coded as follows:

- nature of address indicator:

000 0100 (international number) in case of a foreign MS

000 0011 (national significant number) in case of a national MS