Technical Specification Group Services and System Aspects **TSGS#15(02)0090** Meeting #15, Cheju Island, Korea, 11-14 March 2002

Source: TSG-SA WG4

Title: CRs to TS 28.062 on " Corrections to "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service

Description " (Release 4)

Document for: Approval

Agenda Item: 7.4.3

The following CRs, agreed at the TSG-SA WG4 meeting #20, are presented to TSG SA #15 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
28.062	004		REL-4	Correction of OM & OD bits mapping in TFO 16k frames	F	4.2.0	S4	TSG-SA WG4#20	S4-020026
28.062	005	1	REL-4	Inclusion of the Non_Speech TFO frames in conditions for TFO_Frame	F	4.2.0	S4	TSG-SA WG4#20	S4-020176
28.062	007	2	REL-4	Corrections in TFO Protocol Tables	F	4.2.0	S4	TSG-SA WG4#20	S4-020180
28.062	013		REL-4	Corrected C-Code for AMR TFO decision rules	F	4.2.0	S4	TSG-SA WG4#20	S4-020142
28.062	016		REL-4	Corrections	F	4.2.0	S4	TSG-SA WG4#20	S4-020141

3GPP TSG-SA4 Meeting #20 Lulea, Sweden, 18th – 22nd February 2002

Tdoc S4-020026 Agenda item 8

		CHANGE REQUEST										
ж	28.	062	CR	004		₩ e	٧	¥	Current vers	sion:	4.2.0	ж
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the # symbols.												
Proposed change affects:												
Title: 第	Cor	rection	n of Ol	M & OD	bits ma	apping	in TF	O 16k	frames			
Source: #	TSC	SA V	NG4									
Work item code: ₩	TFC	D+AMI	R NB						Date: ₩	200	02-03-11	
Category: ₩	Use of the state o	F (corr A (corr B (add C (fund D (edia led exp	rection) respone dition of ctional torial m blanatic	owing cate ds to a co f feature), modification ons of the TR 21.90	orrectior , tion of fe on) a above	n in an e eature)			Release: # Use <u>one</u> of 2 e) R96 R97 R98 R99 REL-4 REL-5	the for (GSA) (Rele (Rele (Rele (Rele		
Reason for change	e: #			_					MR TFO frame it/s, Speech =		-	pending
Summary of chang	уе: Ж	OD s	hall alv	vays be r	napped	on D3.	OM s	hall alv	vays be mappe	ed on l	D4.	
Consequences if not approved:	¥	Possi	ble mis	sundersta	nding le	eading t	o TFC) interw	vorking proble	ems.		
Clauses affected:	ж	C6.1	.5									
Other specs affected:	¥	Te	est spe	ore speci ecificatio ecificati	ns	ns	æ					
Other comments:	\mathfrak{H}											

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

C.6.1.5 Mapping of the Configuration Parameters on 16 and 8 kbit/s TRAU/TFO frames

Table C.6.1.5-1 gives the mapping of the configuration fields for each frame (TRAU/TFO) format:

Table C.6.1.5-1: Mapping of the configuration parameters in the TRAU/TFO frames

Sub-multiplexing		8 kbit/s	8 kbit/s	8 kbit/s	16 kbit/s	16 kbit/s	16 kbit/s
Codec Modes	#bits	No_Data	SID	Speech	No_Speech	Speech	Speech
				≤5,9 kbit/s	-	≤7,95 kbit/s	10,2kbit/s
Time Align. Field	6	D1D6	D1D6	# (=	C6C11	C6C11	C6C11
				TFO_On)			
Config_Prot	3	D55D57	D55D57	D55D57	C14C16	C14C16	C14C16
Message_No	2	D58D59	D58D59	D58D59	C17C18	C17C18	C17C18
TFO_Enable	1	D64	D64	# (= 1)	C20	C20	C20
- (5)							
Par_Type ⁽⁵⁾	2	D65D66	D65D66	# (= 0.0)	D1D2	D1D2	D1D2
OD	1	D67	D67	#	D3	D4 <u>D3</u>	D4 <u>D3</u>
OM ⁽³⁾	1	D68	D68	#	D4	D3 <u>D4</u>	D3 D4
ACS ⁽³⁾	8	D69D76	D69D76	#	D5D12	D5D12	D5D12
(Optimal ACS) ⁽⁵⁾							
SCS ⁽³⁾	8	D77D84	D77D84	#	D13D20	D13D20	D13D20
ATVN ^{(3),} short ⁽⁶⁾	1	D85	D85	#	D21	D21	# (= 0)
Sys_ID, short ⁽⁶⁾	4	D86D89	D86D89	#	D22D25	D22D25	# (= 00)
spare (= 0)	3	D90D92	D90D92	#	D26D28	D26D28	# (= 0)
CRC_A	3	D93D95	D93D95	#	D29D31	D29D31	# ⁽¹⁾
(of 28 bits:)		(D6592)	(D6592)		(D1D28)	(D1D28)	
(3)	_						
ACT ⁽³⁾	4	D96D99	D96D99	#	D234D237	D234D237	D234D237
(Optimal ACT) ⁽⁵⁾		D400 D400	D400 D400	,,	D220 D240	D220 D240	D220 D240
	3	D100D102	D100D102	#	D238D240	D238D240	D238D240
Codec List	13	D103D115	D103D115	#	D241D253	D241D253	D241D253 # ⁽²⁾
CRC_B	3	D116D118	D116D118	#	D254D256	D254D256	#` ′
(of 20 bits:)		(D96115)	(D96115)		(D234253)	(D234253)	
SCS_2 ⁽⁴⁾	8	D17D24	# (= 11) ⁽⁷	#	D203D210	D203D210	# (= 11) (7)
OM 2 ⁽⁴⁾	1	D17D24	# (= 11)	#	D203D210	D203D210	# (= 11)
MACS_2 ⁽⁴⁾	3	D26D28	# (= 0)	#	D211.D214	D212D214	# (= 0)
ATVN_2 ⁽⁴⁾⁽⁶⁾	1	D20D20	# (= 1.0.0)	#	D212D214 D215	D212D214 D215	# (= 1.0.0)
SCS 3 ⁽⁴⁾	8	D30D37	# (= 0) # (= 11) ⁽⁷	#	D216D223	D216D223	# (= 0) # (= 11) ⁽⁷⁾
OM_3 ⁽⁴⁾	1	D30D37	# (= 11)	#	D216D223	D216D223	# (= 11)
MACS_3 ⁽⁴⁾	3	D39D41	# (= 0)	#	D225D227	D225D227	# (= 0)
ATVN_3 ⁽⁴⁾⁽⁶⁾	1	D39D41	# (= 1.0.0)	#	D223D221	D225D227 D228	# (= 1.0.0)
spare (=0)	2	D42 D43D44	# (= 0)	#	D229D230	D229D230	# (= 0)
CRC C	3	D45D44	#	#	D229D230	D229D230	#
(of 28 bits:)	3	(D1744)	#	#	(D203230)	(D203230)	#
(OI ZO DIGO.)		(51777)			(5200200)	(5200200)	
8k_spare	7	D48D54	#	#			
8k_spare	7	D119D125	D119D125	#			
16k_spare	14	D110D120	D110D120	T	D44D57	#	#
τοκ_οραίο	17				וטטדדט ן	πt	πt

The bit positions refer to the positions reserved in 3GPP TS 48.060 [3] and 3GPP TS 48.061 [4]: D bits are data bits, C bits are control bits. The parameters are mapped into the field with MSB first, example:

Par_Type: MSB => D65, LSB => D66 in 8k frames.

denotes not existing fields; the entries in brackets () denote the default values of the missing parameters, see Note⁽⁷⁾. Only if the missing parameters are set to these default values, these frames may be used. Otherwise No_Data frames shall be used.

NOTE 1: In Mode 10,2 the bits D93..D95 are already used for the CRC1 of the first sub-frame. The bits otherwise protected by CRC_A shall be protected in Mode 10,2 by CRC1 (see 3GPP TS 48.060 [3]).

- NOTE 2: In Mode 10,2 the bits D254..D256 are already used for the CRC4 of the fourth sub-frame. The bits otherwise protected by CRC_B shall be protected in Mode 10,2 by CRC4 (see 3GPP TS 48.060 [3]).
- NOTE 3: The fields ACS, SCS,MACS, OM and ATVN shall always be used for the Active Codec Type, if from the AMR family.
- NOTE 4: The fields SCS_2 ... ATVN_3 are reserved for the other AMR Codec Types, when flagged in the Codec_List, according to the following mapping:

Active Codec Type	ACS, SCS, OM, MACS, ATVN	SCS_2, OM_2, MACS_2, ATVN_2	SCS_3, OM_3, MACS_3, ATVN_3
none of AMR	FR_AMR	HR_AMR	UMTS_AMR(_2)
FR_AMR	FR_AMR	HR_AMR	UMTS_AMR(_2)
HR_AMR	HR_AMR	FR_AMR	UMTS_AMR(_2)
UMTS_AMR(_2) ⁽⁸⁾	UMTS_AMR(_2)	FR_AMR	HR_AMR

- If a Codec Type is not within the Codec_List, then the corresponding fields are undefined and shall be set to "0".
 - NOTE 5: If Par_Type is set to "Optimal Configuration", then ACT and ACS shall carry the optimal configuration. All other configuration parameters shall carry the Codec List and the relevant configuration parameters.
 - NOTE 6: For Sys_ID and ATVN a short form is used: only lower 4 bits for Sys_ID, only LSB for AVTN. The missing bits are defined to be "0".
 - NOTE 7: The default setting for the SCS fields shall be "1111.1111" for FR_AMR and UMTS_AMR and "0001.1111" for HR AMR.
 - NOTE 8: Either UMTS_AMR or UMTS_AMR_2 shall be indicated, but not both together, with preference to UMTS_AMR_2.
 - Note for the AMR_TFO_8+8k frames: Only the "No_Data" frames convey all configuration parameters. Thus, a speech frame has to be stolen when this configuration information has to be sent. The frames with a rate lower or equal to 5,9 kbit/s can convey only the Config_Prot and Mess_No without stealing a speech frame. Par_Type in these speech frames is assumed to be "0.0".
 - **Note for the AMR_TFO_16k frames:** All the configuration parameters are included in the rates below the 10,2 kbit/s. The 12,2 kbit/s conveys TFO enable and the Config_Prot only. Par_Type in 12,2 kbit/s speech frames is assumed to be "0.0". Thus a speech frame has to be stolen to send configuration parameters.

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		Sp	ec T	itle:	Inban	d Tande	em Fre	e Ope	ratio	on (T	FO)	of sp	eech co	odecs		¥	
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the % symbols.																	
Proposed change affects: # (U)SIM ME/UE Radio Access Network X Core Network																	
Title:		Ж	Corr	ection	ns in T	FO Pro	tocol T	ables									
Source:		ж	TSG	SAV	WG4												
Work ite	m code	<i>:</i>	TFO										Date: 3	200	02-03-11		
Categor	Category: # F Use one of the following categories: Release: # REL-4 Use one of the following release																
	F (correction)2(GSM Phase 2)A (corresponds to a correction in an earlier release)R96(Release 1996)B (addition of feature),R97(Release 1997)C (functional modification of feature)R98(Release 1998)D (editorial modification)R99(Release 1999)Detailed explanations of the above categories canREL-4(Release 4)be found in 3GPP TR 21.900.REL-5(Release 5)																
Reason	for char	nge	<i>:</i>	Error	s in TI	FO prot	ocol										
Summar	y of cha	ang		even	t 17 is		ed. Cha	ange a	ctio	ns in	MIS	whe	n event	15 or	s in KON 16 is red		
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Table 10.4-1: Events of the State Machine Description

#	Event	Description
1	TFO_Enable	The event TFO_Enable occurs when all TFO parameters get available in the
		transcoder and the controlling entity enables TFO. In GSM, it means that the TFOE bit of AMR TRAU Frames toggles from '0' to '1'. Enabling TFO might
		involve a proprietary process not further addressed in the present document.
2	New_Speech_Call	This event occurs when a new speech call is set-up or the TRAU/TC is re-
		initialised (e.g. after a handover failure). In GSM, this means that the transcoder is initialised by the BTS by two consecutive TRAU frames with identical codec
		types (GSM_FR, GSM_HR, GSM_EFR) or by a config frame (AMR codec
	TEO D: 11	types). In 3G, this means that the lu User Plan is initialised.
3	TFO_Disable	The event TFO_Disable occurs when TFO is disabled by the controlling entity. In GSM, the TFO_Disable event is also controlled by the TFOE bit of AMR
		TRAU Frames.
4	TRAU_Idle	This event occurs when the transcoder is set into idle mode.
5	PCM_Non_Idle	The event PCM_Non_Idle occurs if more than one PCM samples are received that are different to PCM_Idle.
12	TFO_Frame and	This event means that a valid TFO Frame was received by the transcoder and
	Match_1	the condition Match_1 is fulfilled.
17	TFO_Frame and Match_2	This event means that a valid TFO Frame was received by the transcoder and the condition Match_2 is fulfilled.
38	TFO_Frame and	This event means that a valid TFO Frame was received by the transcoder and
	Mismatch_1	the condition Mismatch_1 is fulfilled.
39	TFO_Frame and Mismatch_2	This event means that a valid TFO Frame was received by the transcoder and the condition Mismatch_2 is fulfilled.
13	New_Local_Codec and	This event occurs when the local used codec type changes and either the
	(NA_TP A_TP)	condition NA_TP or the condition A_TP is fulfilled.
15	New_Local_Codec and TM	This event occurs when the local used codec type changes and the condition TM is fulfilled.
14	New_Local_Config and	This event occurs when an AMR codec type is used and the local codec
	(NA_TP A_TP)	configuration changes and the condition A_TP is fulfilled.
16	New_Local_Config and TM	This event occurs when an AMR codec type is used and the local codec configuration changes and the condition TM is fulfilled.
32	RC_ack	This event (rate control acknowledgement) occurs when an acknowledgement to
		the RCi action is received from the BTS/RNC indicating that the rate control command was understood (TFO_Soon acknowledgement in GSM, Rate_Ack in
		UMTS).
40	New_Local_Codec_List	This event occurs when the local codec list changes.
41	Data_Call	This event is only relevant for GSM systems. It occurs when the transcoder is
		informed that a Data Call is set-up.
44	Runout	The event Runout occurs when the last TFO message has been taken from the Transmit Queue and the last 10 bits are going to be sent. So there is still some
		time for TFO_Protocol to react and place a further TFO Message in the Transmit
4.5		Queue, which then shall be transmitted without gap to the messages before.
45 46	T==0 Frame_Sync_Lost and	This event occurs when a time-out has been reached. This event occurs when the TFO frame synchronisation is lost for the first or the
40	n<3	second time. For further details see Annex C.
47	Frame_Sync_Lost and	This event occurs when the TFO frame synchronisation is lost for more than two
48	n>2 Mes_Sync_Lost	times. For further details see Annex C. This event corresponds to a loss of TFO message synchronisation. For further
		details see Annex C.
35	Handover_Soon and	This event occurs when the TRAU/TC is informed that a local hand-over will
36	(NA_TP A_TP) Handover_Soon and	soon take place and either the condition NA_TP or the condition A_TP is fulfilled. This event occurs when the TRAU/TC is informed that a local hand-over will
	TM	soon take place and the condition TM is fulfilled.
6	TFO_REQ and	This event occurs when a TFO_REQ message is received, either the condition
	(NA_TP A_TP) <u>and</u> Dsig==Lsig <u>and</u>	NA_TP or the condition A_TP is fulfilled and the distant signature is equal to the local signature but different from the old (local) signature.
	Dsig!=Old_Sig	

#	Event	Description
7	TFO_REQ and	This event occurs when a TFO_REQ message is received, the condition NA_TP
	(NA_TP <u> A_TP)</u> and	or A_TP is fulfilled, and the distant signature is equal to the old signature.
	Dsig==Old_Sig	This word are under a TEO DEO management is used with a the condition
8	TFO_REQ and (NA_TP A_TP) and	This event occurs when a TFO_REQ message is received, either the condition NA_TP or the condition A_TP is fulfilled, and the distant signature is different
	Dsig!=Lsig_and	from the local signature and old (local) signature.
	Dsig!=Old_Sig	mont the local signature and old (local) signature.
24	TFO_REQ and	This event occurs when a TFO_REQ message is received, the condition TM is
	TM and	fulfilled, and the distant and the local signatures are equal.
	Dsig==Lsig	
25	TFO_REQ and	This event occurs when a TFO_REQ message is received, the condition TM is
	TM and Dsig!=Lsig	fulfilled, and the distant signature is different from the local signature.
9	TFO_ACK and	This event occurs when a TFO_ACK message is received, the condition NA_TP
	NA_TP and	is fulfilled, and the local and distant signatures are equal.
	Dsig==Lsig	
10	TFO_ACK and	This event occurs when a TFO_ACK message is received, either the condition
	(NA_TP A_TP) and	NA_TP or the condition A_TP is fulfilled, and the distant signature is different
26	Dsig!=Lsig TFO_ACK and	from the local signature. This event occurs when a TFO_ACK message is received and the condition TM
20	TFO_ACK and TM and	is fulfilled. The distant signature is ignored for this event.
	Dsig==?	10 Taminou. The dictart digitatore is ignored for this event.
31	TFO_ACK and	This event occurs when a TFO_ACK message is received, the condition A_TP is
	A_TP and	fulfilled, and the distant signature is equal to the local signature.
	Dsig==Lsig	
11	TFO_TRANS and	This event occurs when a TFO_TRANS message is received when a non-AMR
	Luc != AMR and DCh==LCh	codec type is used on the local side and the distant and local channel types do match.
30	TFO_TRANS and	This event occurs when a TFO_TRANS message is received while a AMR codec
30	Luc == AMR and	type is used and the distant and local channel types do match.
L	DCh==LCh	y,
37	TFO_TRANS and	This event occurs when a TFO_TRANS message is received and a channel
1.5	DCh!=LCh	mismatch occurs.
18	TFO_SYL	This event occurs when a TFO_SYL message is received.
19 20	TFO_DUP TFO_REQ_L and	This event occurs when a TFO_DUP message is received. This event occurs when a TFO_REQ_L message is received, either the
20	(NA_TP A_TP) and	condition NA_TP or the condition A_TP is fulfilled, and the local signature is
	Dsig==Lsig	equal to the distant signature.
21	TFO_REQ_L and	This event occurs when a TFO_REQ_L message is received, either the
	(NA_TP A_TP) and	condition NA_TP or the condition A_TP is fulfilled, and the local and distant
27	Dsig!=Lsig	signatures are different.
21	TFO_REQ_L and TM and	This event occurs when a TFO_REQ_L message is received, the condition TM is fulfilled, and the local and distant signatures are equal.
	Dsig==Lsig	Tammoa, and the local and distant signatures are equal.
28	TFO_REQ_L and	This event occurs when a TFO_REQ_L message is received, the condition TM is
	TM and	fulfilled and the local and distant signatures are different.
	Dsig!=Lsig	The second secon
22	TFO_ACK_L and	This event occurs when a TFO_ACK_L message is received, either the condition
	(NA_TP A_TP) and Dsig==Lsig	NA_TP or the condition A_TP is fulfilled, and the local signature is equal to the distant signature.
23	TFO_ACK_L and	This event occurs when a TFO_ACK_L message is received, either the condition
	(NA_TP A_TP) and	NA_TP or the condition A_TP is fulfilled, and the local and distant signatures are
	Dsig!=Lsig	different.
29	TFO_ACK_L and	This event occurs when a TFO_ACK_L message is received and the condition
	TM and	TM is fulfilled. The distant signature is not relevant for this event.
42	Dsig==?	This event occurs when a TEO EILL message is received
42	TFO_FILL TFO_NORMAL	This event occurs when a TFO_FILL message is received. This event occurs when a TFO_NORMAL message is received.
49	Distant_Config and	This event occurs when a 3G system (TC) receives a config request from the
	(NA_TP A_TP) and	distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config
	Con_Req & TC	frame are compatible with the local parameters so that TFO is possible.
50	Distant_Config and	This event occurs when 3G system (TC) receives a config request from the
	TM and	distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config
51	Con_Req & TC Distant_Config and	frame do not match with the local parameters so that TFO is not possible. This event occurs when a 3G system (TC) receives a config acknowledgement
01	(NA_TP A_TP) and	from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this
	\'_\\\ /_\\\ / \\\\	1 10 11 die die dan 110 to 10 to 10 to 20 diable bit is set, and the parameters of this

#	Event	Description
	Con_Ack & TC	config frame are compatible with the local parameters so that TFO is possible. This event does not occur when an acknowledgement for a config request indicating Handover_Soon is received.
52	Distant_Config and TM and Con_Ack & TC	This event occurs when 3G system (TC) receives a config acknowledgement from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config frame do not match with the local parameters so that TFO is not possible. This event does not occur when an acknowledgement for a config request indicating Handover_Soon is received.
53	Distant_Config and (NA_TP A_TP) and TRAU	This event occurs when a 2G system (TRAU) receives a config frame (config request or config acknowledgement) from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config frame are compatible with the local parameters so that TFO is possible. This event does not occur when an acknowledgement for a config request indicating Handover_Soon is received.
54	Distant_Config and TM and Con_Req & TRAU	This event occurs when a 2G system receives a config request from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config frame do not match with the local parameters so that TFO is not possible.
55	Distant_Config and TM and Con_Ack & TRAU	This event occurs when a 2G system receives a config acknowledgement from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config frame do not match with the local parameters so that TFO is not possible. This event does not occur when an acknowledgement for a config request indicating Handover_Soon is received.
56	Distant_Disable	This event occurs when a config frame (config request) with a TFO_Enable bit set to zero is received from the distant TRAU/TC, i.e. when the distant side is going to disable TFO.

Table 10.6-2: PCM_Non_Idle and Loopback Handling

5

Event:	PCM_Non_Idle	TFO_REQ	TFO_REQ
Number:	5	6	7
Condition:		(NA_TP A_TP)	(NA_TP_A_TP)
&		Dsig==Lsig	Dsig==Old_Sig
<u>&</u>		Dsig!=Old Sig	
Comment:	Occurs only at the		Loopback (LB)
04 - 4	beginning	or distant handover	or distant
State:		(HO)? wrong Sig	handover (HO)?
NAC:			
Not_Active			
WAK:	C;F;REQ;		
Wakeup	FIT; Typ 2 nd Event		
	Typ Z Event	0.00.050	
FIT:		C;SO;REQ;	NoAc; FIT;
First_Try		FIT; LB!	Ignore LB
000			ļ ~
COR:		C;SO;REQ;	NoAc;
Continuous Retry		COR; LB!?	COR; Ignore LB
PER:			Ignore Lb
PER: Periodic		C;F;S;ACK; CON;	
Retry		Dist HO!	
MON:			
Monitor		C;F;S;REQ; FIT;	
IVIOTITIOI		Dist HO!	
MIS:		C;F;S;ACK;	
Mismatch		CON;	
Mismaton		Dist HO!	
CON:		C;SO;REQ;	
Contact		COR;	
Comac		Safe way	
FAT:		C;SO;REQ;RCm;	
Fast		COR;	
Try		Safe way	
FAC:		C;SO;REQ;RCm;	
Fast		COR;	
Contact		Safe way	
WRC		C;SO;RCm;REQ;	
Wait_RC		COR;	
KON:		C;DT;SO;RCm,REQ;T1;	
Konnect		COR;	
		IPEs transparent!	
REK:		C;DT;SO;RCm;REQ;IT;B;T1;	
Re_Konnect		COR;	
		IPEs transparent!	
SOS:		C;IT;S;RCm;REQ;B;T1;	
Sync_Lost		COR;	
		Contact is back	
OPE:			
Operation			
FAI:		NoAc;	
Failure		FAI;	

Table 10.6-3: Most Important Cases, Especially at Call Set-up

Event:	TFO_REQ	TFO_ACK	TFO_ACK	TFO_TRANS	TFO_Frame
Number:		9	10	11	12
Condition:	(NA_TP A_TP)	NA_TP	(NA_TP A_TP)	Luc != AMR	Match_1
&	Dsig!=Lsig	Dsig==Lsig	Dsig!=Lsig	DCh==LCh	
<u>&</u>	Dsig!=Old_Sig				
Comment:	Distant REQ	Distant ACK	Wrong Response	similar to ACK	First or second
	Good Signature	Good Signature	Handover?	As response	TFO Frame
State:				to loc ACK_?	
NAC:					
Not_Active					
WAK:					
Wakeup					
FIT:	C;U;ACK;	C;U;T;BT;T;T1;	C;REQ;	NoAc;	C;U;DUP;RCi;
First_Try	CON;	KON;	FIT;	FIT;	FAT;
	Typical	Typical; IPEs!		Wait for Frame	1: HO
COR:	C;U;ACK;	C;U;T;BT;T;T1;	C;REQ;	NoAc;	C;U;DUP;
Continuous	CON;	KON;	COR;	COR;	FAT;
Retry	Typical	Typical; IPEs!		Wait for Frames	1: Call is back?
PER:	C;F;ACK;	C;F;S;REQ;	C;F;REQ;	NoAc;	C;DUP;
Periodic	CON;	COR;	COR;	PER;	FAT;
Retry	OK, Contact is back	Rare case, test		Wait for Frames	1: Call is back?
MON:	C;F;REQ;	C;F;S;REQ;	C;F;REQ;	NoAc;	C;DUP;
Monitor	FIT;	FIT;	FIT;	MON	FAT;
	IPEs?	Rare case, test		Wait for Frames	1: Call is back?
MIS:	C;F;ACK;	C;F;S;REQ;	C;F;REQ;	NoAc;	C;DUP;
Mismatch	CON;	COR;	COR;	MIS;	FAT;
	Mismatch resolved	Rare case, test		Wait for Frames	1: Call is back?
CON:	C;ACK;	C;T;BT;T;T1;	C;REQ;	C;T;BT;T;T1;	C;T;BT;T;T1;
Contact	CON;	KON;	COR;	KON;	KON;
	Typical: wait	Typical: yes!		yes! Fast way	Missed TRANS?
FAT:	C;REQ;RCm;	C;REQ;RCm;	C;REQ;RCm;	NoAc;	NoAc;
Fast	COR;	COR;	COR;	FAC;	FAT;
Try	Safe way	Safe way	Safe way	Wait for Frames	2: Typ. Loc HO
FAC:	C;REQ;RCm;	C;REQ;RCm;	C;REQ;RCm;	NoAc;	C;BT;T;L;T2;AT;B;
Fast	COR;	COR;	COR;	FAC;	OPE;
Contact	Safe way	Safe way	Safe way	Wait for Frames	5: Typ. Loc HO
WRC	C;RCm;REQ;T1;		C;RCm;REQ;		AT
Wait_RC	COR;		COR;		WRC;
KON:	C;RCm;DT;REQ;T1;	NoAc;	NoAc;	NoAc;	RCs;AT;L;T2;B;
Konnect	COR;	KON;	KON;	KON;	OPE;
	IPEs transparent!	Typical: wait	,	Typical: wait	Typ: call set-up
REK:	C;RCm;DT;REQ;IT;B;T1;	C;DT;REQ;IT;B;T1;	C;DT;RCm;REQ;IT;B;	NoAc;	AT;L;T2;B;
Re_Konnect		COR;	T1	REK;	OPE;
	IPEs transparent!		COR;	Wait for Frames	5: Typ. Dis HO
SOS:	C;RCm;IT;REQ;B;T1;	C;IT;REQ;B;T1;	C;IT;RCm;REQ;B;T1;	NoAc;	C;BT;T;L;T2;B;
Sync_Lost	COR;	COR;	COR;	SOS;	OPE;
, ======	Contact is back	Contact is back	Contact is back	Wait for Frames	short Interrupt?
OPE:				NoAc;	NoAc;
Operation				OPE;	OPE;
				Typical in HO	Main! TFO!
FAI:	NoAc;	NoAc;	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;	FAI;	FAI;
. and o	,			,	
			l		

Table 10.6-4: In Call Modification and Handover

Event:	New_Local_Codec New_Local_Config	New_Local_Codec New_Local_Config	TFO_Frame	TFO_SYL	TFO_DUP
Number:		15, 16	17	18	19
Condition: &	(NA_TP A_TP)	TM	Match_2		
Comment: State:	In Call Modif. Mismatch resolv	In Call Modif. Mismatch occurs	Three or more TFO Frames	The dist TC lost sync in OPE	The dist TC recognised HO Identical #17
NAC:					
Not_Active					
WAK: Wakeup	NoAc; WAK;	NoAc; WAK;			
FIT: First_Try	C;REQ; FIT; Restart	C;REQ; FIT; Restart		NoAc; FIT; HO? Ignore	NoAc; FIT; HO? Ignore
Retry	C;REQ; COR;	C;REQ; COR;		NoAc; COR; Ignore	NoAc; COR; Ignore
PER: Periodic Retry	L1;T5; PER;	L1;T5; PER;		C;F;REQ; COR; Rare case, test	C;F;REQ; COR; Rare case, test
MON: Monitor	NoAc; MON	NoAc; MON		C;F;REQ; FIT; Rare case, test	C;F;REQ; FIT; Rare case, test
MIS: Mismatch	C;F;REQ; COR; Mismatch Res.	C:L;T2;B; MIS; Direct info		C;F;REQ; COR; Rare case, test	C;F;REQ; COR; Rare case, test
CON: Contact	C;REQ; COR;	C;L;T2;B; MIS;		C;F;REQ; COR; Rare case, test	C;F;REQ; COR; Rare case, test
FAT: Fast Try	NoAc; FAT;	C;L;T2;B;RCm; MIS;	NoAc; FAC;	NoAc; FAC; 3: Typ. Loc HO	C;F;REQ;RCm; COR; Rare case, test
FAC: Fast Contact	NoAc; FAC;	C;L;T2;B;RCm; MIS;	C;BT;T;L;T2;AT;B;RCs; OPE; assume matching ACS	NoAc; FAC; 4: Typ Loc HO	C;F;REQ;RCm; COR; rare case, test
WRC Wait_RC	C;RCm;REQ; COR;	C;RCm;L;T2;B; MIS;	NoAc; WRC;	NoAc; WRC;	NoAc; WRC;
KON: Konnect	C;RCm;DT;REQ; COR;	C;RCm;DT;L;T2;B; MIS;	RCs;AT;L;T2;B;OPE;	NoAc; KON; Wait, short int?	NoAc; KON; Other TC?
REK: Re_Konnect	C;RCm;DT;IT;REQ; COR;	C;RCm;DT;IT;L;T2;B; MIS;		C;DT;SYL; SOS; IPEs not transp?	NoAc; REK; 4: Typ. Dist HO
SOS: Sync_Lost	C;RCm;IT;REQ; COR;	C;RCm;IT;L;T2;B; MIS;		NoAc; SOS; Short Interrupt.?	C;BT;T;T1; REK; 3: typ Dis HO
OPE: Operation	RCs;L;T2; OPE;	C;RCm;DT;IT;L;T2;B; MIS;	NoAc; OPE; Main! TFO!	NoAc; OPE; Short interrupt?	NoAc; OPE; Typical
FAI: Failure	NoAc; FAI;	NoAc; FAI;	NoAc; FAI;	NoAc; FAI;	NoAc; FAI;

Table 10.6-11: Special Events, Timeouts

Event:	Runout	T==0	Frame_Sync_Lost	Frame_Sync_Lost	Mes_Sync_Lost
Number:	44	45	46	47	48
Condition: &			n<3	n>2	
Comment: State:	IPEs may become unsynchronised	Time-Out	start to send SYL already	Stop TFO Frames if 3 Frames missing	
NAC: Not_Active					
WAK: Wakeup					
FIT: First_Try	U;N; MON; PSTN Call				NoAc; FIT;
COR: Continuous Retry	U;L1;T5; PER; at end of COR	C;N;REQ; COR; Reset IPEs			NoAc; COR;
PER: Periodic Retry	NoAc; PER;	L1;T5; PER; Periodic Test			NoAc; PER;
MON: Monitor		C;N; MON;			
MIS: Mismatch	NoAc; MIS; typ Final state	N;B; MIS; List not Ack_ed!	NoAc; MIS;	NoAc; MIS;	NoAc; MIS;
CON: Contact	REQ; COR; can this occur?				C;REQ; COR;
FAT: Fast Try	REQ;RCm; COR; fast HO failed		NoAc; FAT; typical in HO	NoAc; FAT; typical in HO	C;REQ;RCm; COR; fast HO failed
FAC: Fast Contact	REQ;RCm; COR; fast HO failed		NoAc; FAC; typical in HO	NoAc; FAC; typical in HO	C;REQ;RCm; COR; fast HO failed
WRC Wait_RC	C; T;BT;T;T1; KON; Missing RC_Ack	C; T;BT;T;T1; KON; Missing RC_Ack	NoAc; WRC;	IT; WRC;	C;RCm;REQ; COR;
KON: Konnect	NoAc; KON; may happen	C;RCm;DT;N; FAI; Misbehaviour!			C;RCm;DT;REQ;T1; COR; after Timeout: N
REK: Re_Konnect	NoAc; REK; may happen	C;RCm;DT;N;IT;B; FAI; Misbehaviour!			C;RCm;DT;REQ;IT;B;T1; COR; after Timeout: N
SOS: Sync_Lost	RCm;REQ;IT;B;T1; COR; after Timeout: N			NoAc; SOS; wait for Runout	C;RCm;REQ;IT;B;T1; COR; after Timeout: N
OPE: Operation	NoAc; OPE; typ Final event	B; OPE; List not Ack_ed!	SYL1; OPE; 1: Alarm, go on	C;DT;SYL; SOS; 2: Alarm, stop!	NoAc; OPE; Typ Final event
FAI: Failure	NoAc; FAI; typical				NoAc; FAI; don't trust!

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Proposed change	Proposed change affects: (U)SIM ME/UE X Radio Access Network Core Network X														
Title:	Inc	lusion	of the	Non_S	peech	TFO	fram	es in	cond	ditions 1	for TF	O_Fra	ame		
Source: #	TS	G SA V	NG4												
Work item code: ₩	TF	O-AMF	2							D	ate:	11-	Mar-20	02	
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Other specs affected:	¥	Te	est spe	ore spece ecification pecificat	ons	ns	¥								
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10.2.2 Conditions for TFO Frame

In the context of a TFO_Frame event the conditions Match_1, Match_2, Mismatch_1, and Mismatch_2 are used. N represents the number of consecutive TFO frames received, corresponding to the conditions.

Match 1

Match 1 is fulfilled if one of the following conditions is true:

- A non-AMR codec type is used and the distant used codec type is equal to the local used codec type (Duc==Luc) and n<3.
- An AMR codec type is used and

the local used codec type and the distant used codec type are compatible and the distant used codec mode is contained in the local ACS and n<3

orAn AMR codec type is used and the local used codec type and the distant used codec type are compatible and a Non Speech TFO frame (i.e.e.g. Sid First, Sid-Update, Sid Bad, No Data, etc. and Onset) is received and n<3.

Match 2

Match_2 is fulfilled if one of the following conditions is true:

- A non-AMR codec type is used and the distant used codec type is equal to the local used codec type (Duc==Luc) and n>2.
- An AMR codec type is used and the local used codec type and the distant used codec type are compatible and the distant used codec mode is contained in the local ACS and n>2-or
- An AMR codec type is used and the local used codec type and the distant used codec type are compatible and a Non_Speech TFO frame (i.e. Sid_First, Sid-Update, Sid_Bad, No_Data and Onset) is received and n>2.

Mismatch_1

Mismatch_1 is fulfilled if one of the two following conditions is true:

- A non-AMR codec type is used and the distant used codec type is different from the local used codec type (Duc!=Luc) and n==1.
- An AMR codec type is used and the TFO frame doesn't match because of incompatible codec types or a used codec mode that is not in the ACS and n<3.

Mismatch_2

Mismatch_2 is fulfilled if one of the following conditions is true:

- A non-AMR codec type is used and the distant used codec type is different from the local used codec type (Duc!=Luc) and n>1.
- An AMR codec type is used and the TFO frame doesn't match because of incompatible codec types or a used codec mode that is not in the ACS and n>2.

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			СН	ANGE	E R	EQ	UE	ST	•				CA	A-FOIIII-V3
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Source: #	TS	G SA V	VG4											
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Source: #	TSG SA	NG4							
Work item code: ₩	TFO-AMF	?			Date:	11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002 11-Mar-2002	<u>)</u>		
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Consequences if not approved:	# An Er	ror case is intr	oduced in the	protoco	I for the BIS				
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- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.7 Distant Handover, TFO Interruption

9.7.1 Sync_Lost State

If the TC was in Operation State and suddenly the TFO Frame synchronisation is lost, then the TC enters the Sync_Lost State for a short while, before it transits to Continuous_Retry.

If synchronisation was lost due to a distant handover, then a fast TFO establishment might be possible and the TC enters Operation State soon again. In Sync_Lost it expects TFO_DUP Message as confirmation of the distant handover. Then it transits to Re_Konnect.

9.7.2 Re_Konnect State

This State is entered from Operation via Sync_Lost, if TFO_DUP Messages are received. The TC starts immediately to send TFO Frames again, with a TFO_TRANS embedded into the first TFO Frames. The TC transits back to Operation State, as soon as TFO Frames are received, again.

9.7.3 TFO_Term

This State is entered when TFO is disabled by the TRAU/TC. The TRAU/TC stops then sending TFO frames but still accepts receiving TFO frames and messages sent by the distant TRAU/TC. The TRAU/TC transits through this state before entering to Not Active state after the TFO termination has been acknowledged by the distant side.

10.4 Detailed Description of the Events

Table 10.4-1 lists all events of the Protocol Tables.

Table 10.4-1: Events of the State Machine Description

#	Event	Description
1	TFO_Enable	The event TFO_Enable occurs when all TFO parameters get available in the transcoder and the controlling entity enables TFO. In GSM, it means that the
		TFOE bit of AMR TRAU Frames toggles from '0' to '1'. Enabling TFO might involve a proprietary process not further addressed in the present document.
2	New_Speech_Call	This event occurs when a new speech call is set-up or the TRAU/TC is re-
_	New_opecon_oan	initialised (e.g. after a handover failure). In GSM, this means that the transcoder
		is initialised by the BTS by two consecutive TRAU frames with identical codec
		types (GSM_FR, GSM_HR, GSM_EFR) or by a config frame (AMR codec
		types). In 3G, this means that the lu User Plan is initialised.
3	TFO_Disable	The event TFO_Disable occurs when TFO is disabled by the controlling entity.
		In GSM, the TFO_Disable event is also controlled by the TFOE bit of AMR
_	TDAIL I-II-	TRAU Frames.
5	TRAU_Idle PCM_Non_Idle	This event occurs when the transcoder is set into idle mode. The event PCM_Non_Idle occurs if more than one PCM samples are received
3		that are different to PCM_Idle.
12	TFO_Frame and	This event means that a valid TFO Frame was received by the transcoder and
-	Match_1	the condition Match_1 is fulfilled.
17	TFO_Frame and	This event means that a valid TFO Frame was received by the transcoder and
	Match_2	the condition Match_2 is fulfilled.
38	TFO_Frame and	This event means that a valid TFO Frame was received by the transcoder and
20	Mismatch_1 TFO_Frame and	the condition Mismatch_1 is fulfilled. This event means that a valid TFO Frame was received by the transcoder and
39	Mismatch_2	the condition Mismatch_2 is fulfilled.
13	New_Local_Codec and	This event occurs when the local used codec type changes and either the
.	(NA_TP A_TP)	condition NA_TP or the condition A_TP is fulfilled.
15	New_Local_Codec and	This event occurs when the local used codec type changes and the condition TM
	TM	is fulfilled.
14	New_Local_Config and	This event occurs when an AMR codec type is used and the local codec
	(NA_TP A_TP)	configuration changes and the condition A_TP is fulfilled.
16	New_Local_Config and TM	This event occurs when an AMR codec type is used and the local codec configuration changes and the condition TM is fulfilled.
32	RC_ack	This event (rate control acknowledgement) occurs when an acknowledgement to
		the RCi action is received from the BTS/RNC indicating that the rate control
		command was understood (TFO_Soon acknowledgement in GSM, Rate_Ack in
		UMTS).
40	New_Local_Codec_List	This event occurs when the local codec list changes.
41	Data_Call	This event is only relevant for GSM systems. It occurs when the transcoder is
		informed that a Data Call is set-up.
44	Runout	The event Runout occurs when the last TFO message has been taken from the
		Transmit Queue and the last 10 bits are going to be sent. So there is still some time for TFO_Protocol to react and place a further TFO Message in the Transmit
		Queue, which then shall be transmitted without gap to the messages before.
45	T==0	This event occurs when a time-out has been reached.
46	Frame_Sync_Lost and	This event occurs when the TFO frame synchronisation is lost for the first or the
	n<3	second time. For further details see Annex C.
47	Frame_Sync_Lost and	This event occurs when the TFO frame synchronisation is lost for more than two
F7	n>2 and TFO Disabled	times and TFO has been disabled. For further details see Annex C.
<u>57</u>	Frame_Sync_Lost and n>2 and TFO_Enabled	This event occurs when the TFO frame synchronisation is lost for more than two times and TFO is still enabled. For further details see Annex C.
48	Mes_Sync_Lost	This event corresponds to a loss of TFO message synchronisation. For further
		details see Annex C.
35	Handover_Soon and	This event occurs when the TRAU/TC is informed that a local hand-over will
26	(NA_TP A_TP)	soon take place and either the condition NA_TP or the condition A_TP is fulfilled.
36	Handover_Soon and TM	This event occurs when the TRAU/TC is informed that a local hand-over will soon take place and the condition TM is fulfilled.
6	TFO_REQ and	This event occurs when a TFO_REQ message is received, either the condition
<u> </u>		= 1.1 1.1

#	Event	Description
	(NA_TP A_TP)	NA_TP or the condition A_TP is fulfilled and the distant signature is equal to the
	Dsig==Lsig	local signature.

#	Event	Description
7	TFO_REQ and	This event occurs when a TFO_REQ message is received, the condition NA_TP
•	NA_TP and	is fulfilled, and the distant signature is equal to the old signature.
	Dsig==Old_Sig	
8	TFO_REQ and	This event occurs when a TFO_REQ message is received, either the condition
	(NA_TP A_TP) and	NA_TP or the condition A_TP is fulfilled, and the distant signature is different
	Dsig!=Lsig	from the local signature.
24	TFO_REQ and	This event occurs when a TFO_REQ message is received, the condition TM is
	TM and	fulfilled, and the distant and the local signatures are equal.
25	Dsig==Lsig TFO_REQ and	This event occurs when a TFO_REQ message is received, the condition TM is
23	TM and	fulfilled, and the distant signature is different from the local signature.
	Dsig!=Lsig	Tullinou, and the distant dignature to amoretic from the local dignature.
9	TFO_ACK and	This event occurs when a TFO_ACK message is received, the condition NA_TP
	NA_TP and	is fulfilled, and the local and distant signatures are equal.
	Dsig==Lsig	
10	TFO_ACK and	This event occurs when a TFO_ACK message is received, either the condition
	(NA_TP A_TP) and	NA_TP or the condition A_TP is fulfilled, and the distant signature is different
	Dsig!=Lsig	from the local signature.
26	TFO_ACK and TM and	This event occurs when a TFO_ACK message is received and the condition TM is fulfilled. The distant signature is ignored for this event.
	Dsig==?	is runned. The distant signature is ignored for this event.
31	TFO_ACK and	This event occurs when a TFO_ACK message is received, the condition A_TP is
•	A_TP and	fulfilled, and the distant signature is equal to the local signature.
	Dsig==Lsig	
11	TFO_TRANS and	This event occurs when a TFO_TRANS message is received when a non-AMR
	Luc!= AMR and	codec type is used on the local side and the distant and local channel types do
	DCh==LCh	match.
30	TFO_TRANS and	This event occurs when a TFO_TRANS message is received while a AMR codec
	Luc == AMR and DCh==LCh	type is used and the distant and local channel types do match.
37	TFO_TRANS and	This event occurs when a TFO_TRANS message is received and a channel
"	DCh!=LCh	mismatch occurs.
18	TFO_SYL	This event occurs when a TFO_SYL message is received.
19	TFO_DUP	This event occurs when a TFO_DUP message is received.
20	TFO_REQ_L and	This event occurs when a TFO_REQ_L message is received, either the
	(NA_TP A_TP) and	condition NA_TP or the condition A_TP is fulfilled, and the local signature is
04	Dsig==Lsig	equal to the distant signature.
21	TFO_REQ_L and (NA_TP A_TP) and	This event occurs when a TFO_REQ_L message is received, either the condition NA_TP or the condition A_TP is fulfilled, and the local and distant
	Dsig!=Lsig	signatures are different.
27	TFO_REQ_L and	This event occurs when a TFO_REQ_L message is received, the condition TM is
	TM and	fulfilled, and the local and distant signatures are equal.
	Dsig==Lsig	·
28	TFO_REQ_L and	This event occurs when a TFO_REQ_L message is received, the condition TM is
	TM and	fulfilled and the local and distant signatures are different.
22	Dsig!=Lsig	This event ecours when a TEO ACK I message is received either the sea distant
22	TFO_ACK_L and (NA_TP A_TP) and	This event occurs when a TFO_ACK_L message is received, either the condition NA_TP or the condition A_TP is fulfilled, and the local signature is equal to the
	Dsig==Lsig	distant signature.
23	TFO_ACK_L and	This event occurs when a TFO_ACK_L message is received, either the condition
	(NA_TP A_TP) and	NA_TP or the condition A_TP is fulfilled, and the local and distant signatures are
	Dsig!=Lsig	different.
29	TFO_ACK_L and	This event occurs when a TFO_ACK_L message is received and the condition
	TM and	TM is fulfilled. The distant signature is not relevant for this event.
42	Dsig==? TFO_FILL	This event occurs when a TEO EILL message is received
42	TFO_FILL TFO_NORMAL	This event occurs when a TFO_FILL message is received. This event occurs when a TFO_NORMAL message is received.
49	Distant_Config and	This event occurs when a 3G system (TC) receives a config request from the
	(NA_TP A_TP) and	distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config
	Con_Req & TC	frame are compatible with the local parameters so that TFO is possible.
50	Distant_Config and	This event occurs when 3G system (TC) receives a config request from the
	TM and	distant TRAU/TC, the TFO_enable bit is set, and the parameters of this config
<u></u>	Con_Req & TC	frame do not match with the local parameters so that TFO is not possible.
51	Distant_Config and	This event occurs when a 3G system (TC) receives a config acknowledgement
	(NA_TP A_TP) and	from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this
1	Con_Ack & TC	config frame are compatible with the local parameters so that TFO is possible.

#	Event	Description
		This event does not occur when an acknowledgement for a config request
		indicating Handover_Soon is received.
52	Distant_Config and	This event occurs when 3G system (TC) receives a config acknowledgement
	TM and	from the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this
	Con_Ack & TC	config frame do not match with the local parameters so that TFO is not possible.
		This event does not occur when an acknowledgement for a config request
		indicating Handover_Soon is received.
53	Distant_Config and	This event occurs when a 2G system (TRAU) receives a config frame (config
	(NA_TP A_TP) and	request or config acknowledgement) from the distant TRAU/TC, the TFO_enable
	TRAU	bit is set, and the parameters of this config frame are compatible with the local
		parameters so that TFO is possible. This event does not occur when an
		acknowledgement for a config request indicating Handover_Soon is received.
54	Distant_Config and	This event occurs when a 2G system receives a config request from the distant
	TM and	TRAU/TC, the TFO_enable bit is set, and the parameters of this config frame do
	Con_Req & TRAU	not match with the local parameters so that TFO is not possible.
55	Distant_Config and	This event occurs when a 2G system receives a config acknowledgement from
	TM and	the distant TRAU/TC, the TFO_enable bit is set, and the parameters of this
	Con_Ack & TRAU	config frame do not match with the local parameters so that TFO is not possible.
		This event does not occur when an acknowledgement for a config request
		indicating Handover_Soon is received.
56	Distant_Disable	This event occurs when a config frame (config request) with a TFO_Enable bit
		set to zero is received from the distant TRAU/TC, i.e. when the distant side is
		going to disable TFO.

10.6 Protocol Tables

Table 10.6-1: Enabling/Disabling/New_Speech_Call/TRAU_Idle

Event:	TFO Enable	TFO_Disable
or	New_Speech_Call	
Number:		3, 4
Condition:		
&		
Comment:	TFO gets active.	Local disable.
State:		
NAC:	C;S;IT;RCm;	NoAc;
Not_Active	WAK	NAC;
14/41/	N. A	N
WAK:	NoAc	NoAc;
Wakeup	WAK;	NAC;
FIT:		O.N.
FIT:		C;N;
First_Try		NAC;
COR		C.N.
COR:		C;N;
Continuous Retry		NAC;
PER:		O.N.
		C;N;
Periodic		NAC;
Retry MON:		O.N.
Monitor		C;N; NAC:
IVIOTILOI		NAC,
MIS:		CANIA
Mismatch		C;N; NAC;
IVIISITIAICIT		NAC,
CON:		C;N;
Contact		NAC;
Contact		NAC,
FAT:		C;N;RCm;
Fast		NAC;
Try		NAO,
FAC:		C;N;RCm;
Fast		NAC;
Contact		147.0,
WRC:		C;N;RCm;
Wait_RC		NAC;
Wait_RO		147.0,
KON:		C;RCm;CR;DT;N;-CRT1;
Konnect		NAC;TT;
REK:		C;RCm;CR;DT; IT; N;
Re_Konnect		CRT1;
		NAC;TT;
SOS:		C;RCm;IT;N;
Sync_Lost		NAC;
		,
OPE:		C;RCm;CR;DT;H;N;CRT
Operation		1;
- 50.000		NAC;TT;
FAI:		C;
Failure		NAC;
		Exit from FAI
	l	

Event:	TFO_Enable	TFO_Disable
or	New_Speech_Call	TRAU_ldle
TT:		NoAC;
TFO_Term		TT;

Table 10.6-2: PCM_Non_Idle and Loopback Handling

Event:	PCM_Non_Idle	TFO_REQ	TFO_REQ
Number:	5	6	7
Condition:		(NA_TP A_TP)	NA_TP
&		Dsig==Lsig	Dsig==Old_Sig
Comment:	Occurs only at the		Loopback (LB)
	beginning	or distant handover	or distant
State:		(HO)? wrong Sig	handover (HO)?
NAC:			
Not_Active			
WAK:	C;F;REQ;		
Wakeup	FIT;		
11111111111	Typ 2 nd Event		
FIT:		C;SO;REQ;	NoAc;
First_Try		FIT;	FIT;
		LB!	Ignore LB
COR:		C;SO;REQ;	NoAc;
Continuous		COR;	COR;
Retry		LB!?	Ignore LB
PER:		C;F;S;ACK;	
Periodic		CON;	
Retry		Dist HO!	
MON:		C;F;S;REQ;	
Monitor		FIT;	
		Dist HO!	
MIS:		C;F;S;ACK;	
Mismatch		CON;	
		Dist HO!	
CON:		C;SO;REQ;	
Contact		COR; Safe way	
FAT:			
Fast		C;SO;REQ;RCm; COR;	
Try		Safe way	
FAC:		C;SO;REQ;RCm;	
Fast		COR;	
Contact		Safe way	
WRC:		C;SO;RCm;REQ;	
Wait_RC		COR;	
_		,	
KON:		C;DT;SO;RCm,REQ;T1;	
Konnect		COR;	
		IPEs transparent!	
REK:		C;DT;SO;RCm;REQ;IT;B;T1;	
Re_Konnect		COR;	
		IPEs transparent!	
SOS:		C;IT;S;RCm;REQ;B;T1;	
Sync_Lost		COR;	
		Contact is back	
OPE:			
Operation			
E A L		NI- A	
FAI:		NoAc;	
Failure		FAI;	
TT:			
TFO_Term			
11 0_161111			

Table 10.6-3: Most Important Cases, Especially at Call Set-up

Event:	TFO_REQ	TFO_ACK	TFO_ACK	TFO_TRANS	TFO_Frame
Number:		9	10	11	12
Condition:	(NA_TP A_TP)	NA_TP	(NA_TP A_TP)	Luc != AMR	Match_1
&	Dsig!=Lsig	Dsig==Lsig	Dsig!=Lsig	DCh==LCh	
Comment:	Distant REQ	Distant ACK	Wrong Response	similar to ACK	First or second
	Good Signature	Good Signature	Handover?	As response	TFO Frame
State:				to loc ACK_?	
NAC:					
Not_Active					
WAK:					
Wakeup					
FIT:	C;U;ACK;	C;U;T;BT;T;T1;	C;REQ;	NoAc;	C;U;DUP;RCi;
First_Try	CON;	KON;	FIT;	FIT;	FAT;
	Typical	Typical; IPEs!		Wait for Frame	1: HO
COR:	C;U;ACK;	C;U;T;BT;T;T1;	C;REQ;	NoAc;	C;U;DUP;
Continuous	CON;	KON;	COR;	COR;	FAT;
Retry	Typical	Typical; IPEs!		Wait for Frames	1: Call is back?
PER:	C;F;ACK;	C;F;S;REQ;	C;F;REQ;	NoAc;	C;DUP;
Periodic	CON;	COR;	COR;	PER;	FAT;
Retry	OK, Contact is back	Rare case, test		Wait for Frames	1: Call is back?
MON:	C;F;REQ;	C;F;S;REQ;	C;F;REQ;	NoAc;	C;DUP;
Monitor	FIT;	FIT;	FIT;	MON	FAT;
	IPEs?	Rare case, test		Wait for Frames	1: Call is back?
MIS:	C;F;ACK;	C;F;S;REQ;	C;F;REQ;	NoAc;	C;DUP;
Mismatch	CON;	COR;	COR;	MIS;	FAT;
	Mismatch resolved	Rare case, test		Wait for Frames	1: Call is back?
CON:	C;ACK;	C;T;BT;T;T1;	C;REQ;	C;T;BT;T;T1;	C;T;BT;T;T1;
Contact	CON;	KON;	COR;	KON;	KON;
	Typical: wait	Typical: yes!		yes! Fast way	Missed TRANS?
FAT:	C;REQ;RCm;	C;REQ;RCm;	C;REQ;RCm;	NoAc;	NoAc;
Fast	COR;	COR;	COR;	FAC;	FAT;
Try	Safe way	Safe way	Safe way	Wait for Frames	2: Typ. Loc HO
FAC:	C;REQ;RCm;	C;REQ;RCm;	C;REQ;RCm;	NoAc;	C;BT;T;L;T2;AT;B;
Fast	COR;	COR;	COR;	FAC;	OPE;
Contact	Safe way	Safe way	Safe way	Wait for Frames	5: Typ. Loc HO
WRC:	C;RCm;REQ;T1;		C;RCm;REQ;		AT
Wait_RC	COR;		COR;		WRC;
KON:	C;RCm;DT;REQ;T1;	NoAc;	NoAc;	NoAc;	RCs;AT;L;T2;B;
Konnect	COR;	KON;	KON;	KON;	OPE;
	IPEs transparent!	Typical: wait		Typical: wait	Typ: call set-up
REK:	C;RCm;DT;REQ;IT;B;T1;	C;DT;REQ;IT;B;T1;	, , , , , , , ,	NoAc;	AT;L;T2;B;
Re_Konnect		COR;	T1	REK;	OPE;
	IPEs transparent!		COR;	Wait for Frames	5: Typ. Dis HO
SOS:	C;RCm;IT;REQ;B;T1;	C;IT;REQ;B;T1;		NoAc;	C;BT;T;L;T2;B;
Sync_Lost	COR;	COR;	COR;	SOS;	OPE;
	Contact is back	Contact is back	Contact is back	Wait for Frames	short Interrupt?
OPE:				NoAc;	NoAc;
Operation				OPE;	OPE;
				Typical in HO	Main! TFO!
FAI:	NoAc;	NoAc;	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;	FAI;	FAI;
<u>II:</u>					
TFO_Term					

Table 10.6-4: In Call Modification and Handover

Event:	New_Local_Codec New_Local_Config		TFO_Frame	TFO_SYL	TFO_DUP
Number:		15, 16	17	18	19
Condition:	(NA_TP A_TP)	TM	Match_2		
&	(/				
Comment:	In Call Modif.	In Call Modif.	Three or more	The dist TC lost	The dist TC
	Mismatch resolv	Mismatch occurs	TFO Frames	sync in OPE	recognised HO
State:					Identical #17
NAC:					
Not_Active					
WAK:	NoAc;	NoAc;			
Wakeup	WAK;	WAK;			
·					
FIT:	C;REQ;	C;REQ;		NoAc;	NoAc;
First_Try	FIT;	FIT;		FIT;	FIT;
/	Restart	Restart		HO? Ignore	HO? Ignore
COR:	C;REQ;	C:REQ:		NoAc;	NoAc;
	COR;	COR;		COR;	COR;
Retry	John,	0011,		Ignore	Ignore
PER:	L1;T5;	L1;T5;		C;F;REQ;	C;F;REQ;
Periodic	PER;	PER;		COR;	COR;
Retry	I' LIX,	r Lix,		Rare case, test	Rare case, test
MON:	NoAc;	No Ao			· ·
Monitor	MON	NoAc; MON		C;F;REQ; FIT;	C;F;REQ; FIT;
MOTITO	IVION	IVION		Rare case, test	Rare case, test
MIC	0.5.050	L.TO.D.		· ·	· ·
MIS:	C;F;REQ;	L;T2;B;		C;F;REQ;	C;F;REQ;
Mismatch	COR; Mismatch Res.	MIS; Direct info		COR;	COR;
				Rare case, test	Rare case, test
CON:	C;REQ;	C;L;T2;B;		C;F;REQ;	C;F;REQ;
Contact	COR;	MIS;		COR;	COR;
				Rare case, test	Rare case, test
FAT:	NoAc;	C;L;T2;B;RCm;	NoAc;	NoAc;	C;F;REQ;RCm;
Fast	FAT;	MIS;	FAC;	FAC;	COR;
Try				3: Typ. Loc HO	Rare case, test
FAC:	NoAc;	C;L;T2;B;RCm;	C;BT;T;L;T2;AT;B;RCs;	NoAc;	C;F;REQ;RCm;
Fast	FAC;	MIS;	OPE;	FAC;	COR;
Contact			assume matching ACS	4: Typ Loc HO	rare case, test
WRC:	C;RCm;REQ;	C;RCm;L;T2;B;	NoAc;	NoAc;	NoAc;
Wait_RC	COR;	MIS;	WRC;	WRC;	WRC;
KON:	C;RCm;DT;REQ;	C;RCm;DT;L;T2;B;		NoAc;	NoAc;
Konnect	COR;	MIS;		KON;	KON;
				Wait, short int?	Other TC?
REK:	C;RCm;DT;IT;REQ;	C;RCm;DT;IT;L;T2;B;		C;DT;SYL;	NoAc;
Re_Konnect	COR;	MIS;		SOS;	REK;
1				IPEs not transp?	4: Typ. Dist HO
SOS:	C;RCm;IT;REQ;	C;RCm;IT;L;T2;B;		NoAc;	C;BT;T;T1;
Sync_Lost	COR;	MIS;		SOS;	REK;
				Short Interrupt.?	3: typ Dis HO
OPE:	RCs;L;T2;	C;RCm;DT;IT;L;T2;B;	NoAc;	NoAc;	NoAc;
Operation	OPE;	MIS;	OPE;	OPE;	OPE;
			Main! TFO!	Short interrupt?	Typical
FAI:	NoAc;	NoAc;	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;	FAI;	FAI;
		,	,		·
TT:	C;F;REQ;	NoAc;	NoAc;	IT;N;	NoAc;
TFO_Term	COR;	TT;	TT;	NAC;	TT;
L	l	L	J	I	I.

Table 10.6-5: Special Matching TFO Messages

Event:	TFO_REQ_L	TFO_REQ_L	TFO_ACK_L	TFO_ACK_L
Number:		21	22	23
Condition:	(NA_TP A_TP)	(NA_TP A_TP)	(NA_TP A_TP)	(NA_TP A_TP)
&	Dsig==Lsig	Dsig!=Lsig	Dsig==Lsig	Dsig!=Lsig
Comment:	Only sent in	Only sent in	Only sent in MIS; HO?	HO?
	MIS/OPE/PER HO?	MIS/OPE/PER		
State:	Loop?	Codec_List		
NAC:				
Not_Active				
WAK:				
Wakeup				
•				
FIT:	NoAc;	NoAc;	NoAc;	NoAc;
First_Try	FIT;	FIT;	FIT;	FIT;
,	Ignore	Ignore	Ignore	Ignore
COR:	NoAc;	NoAc;	NoAc;	NoAc;
Continuous	COR;	COR;	COR;	COR;
Retry	Ignore	Ignore	Ignore	Ignore
PER:	C;F;S;REQ;	C;F;REQ;	C;F;S;REQ;	C;F;REQ;
Periodic	C,F,S,REQ,	C,F,REQ, COR;	COR;	C,F,REQ, COR;
Retry	Start again	Start again	Test	Test
MON:	C;F;S;REQ;	C;F;REQ;	C;F;S;REQ;	C;F;REQ;
Monitor	FIT;	FIT;	FIT;	FIT;
IVIOTITO	Test	Test	Test	Test
MIS:				
Mismatch	C;F;S;REQ; COR;	C;F;REQ; COR;	C;F;S;REQ; COR;	C;F;REQ; COR;
IVIISITIATOTI	Test	Test	Test	Test
2011				
CON:	C;S;REQ;	C;REQ;	C;S;REQ;	C;REQ;
Contact	COR;	COR;	COR;	COR;
	Safe way!	Safe way!	Safe way!	Safe way!
FAT:	C;S;REQ;RCm;	C;REQ;RCm;	C;S;REQ;RCm;	C;REQ;RCm;
Fast	COR;	COR;	COR;	COR;
Try	Safe way!	Safe way!	Safe way!	Safe way!
FAC:	C;S;REQ;RCm;	C;REQ;RCm;	C;S;REQ;RCm;	C;REQ;RCm;
Fast	COR;	COR;	COR;	COR;
Contact	Safe way!	Safe way!	Safe way!	Safe way!
WRC:	C;S;RCm;REQ;	C;RCm;REQ;	C;S;RCm;REQ;	C;RCm;REQ;
Wait_RC	COR;	COR;	COR;	COR;
KON:	C;RCm;DT;S;REQ;T1;	C;RCm;DT;REQ;T1;	C;RCm;DT;S;REQ;T1;	C;RCm;DT;REQ;T1;
Konnect	COR;	COR;	COR;	COR;
	Safe way!	Safe way!	Safe way!	Safe way!
REK:	C;RCm;DT;IT;S;REQ;T1;	C;RCm;DT;IT;REQ;T1;	C;RCm;DT;IT;S;REQ;T1;	C;RCm;DT;IT;REQ;T1;
Re_Konnect		COR;	COR;	COR;
	Safe way!	Safe way!	Safe way!	Safe way!
SOS:	C;RCm;IT;S;REQ;B;T1;	C;RCm;IT;REQ;B;T1;	C;RCm;IT;S;REQ;B;T1;	C;RCm;IT;REQ;B;T1;
Sync_Lost	COR;	COR;	COR;	COR;
	Safe way!	Safe way!	Safe way!	Safe way!
OPE:	S;L;T2;B;	C;RCs;LA;B;	C;RCs;B;	S;L;T2;B;
Operation	OPE;	OPE;	OPE;	OPE;
	Tx Codec_List	Ack List, stop	Ack ok, stop	Exchange list
FAI:	NoAc;	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;	FAI;
TT:		<u>C;B;</u>	<u>C;B;</u>	
TFO_Term		TT;	TT;	
	1	1	1	1

Table 10.6-6: TFO Messages with mismatching Codec Type / Configuration

Event:	TFO_REQ	TFO_REQ	TFO_ACK	TFO_REQ_L	TFO_REQ_L	TFO_ACK_L
Number:	24	25	26	27	28	29
Condition:	TM	TM	TM	TM	TM	TM
&	Dsig==Lsig	Dsig!=Lsig	Dsig==?	Dsig==Lsig	Dsig!=Lsig	Dsig==?
Comment:	Mismatch	Mismatch	Mismatch	Mismatch	Mismatch	Mismatch
	Wrong Sig, HO?	Good Sig	w/wo HO	Codec_List	Codec_List	Codec_List
State:			identical #8	Wrong Sig, HO?	Identical #20	Identical #19
NAC:						
Not_Active						
WAK:						
Wakeup						
FIT:	C;S;L;T2;B;	C;U;L;T2;B;	C;U;L;T2;B;	C;S;LA;B;	C;U;LA;B;	C;U;LA;B;
First_Try	MIS;	MIS:	MIS;	MIS;	MIS:	MIS;
	Rare	- /	HO?	rare	Typical: Setup	HO?
COR:	C;S;L;T2;B;	C;U;L;T2;B;	C;U;L;T2;B;	C;S;LA;B;	C;U;LA;B;	C;U;LA;B;
	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
PER:	C;F;S;L;T2;B;	C;F;L;T2;B;	C;F;L;T2;B;	C;F;S;LA;B;	C;F;LA;B;	C;F;LA;B;
	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
Retry						
MON:	C;F;S;L;T2;B;	C;F;L;T2;B;	C;F;L;T2;B;	C;F;S;LA;B;	C;F;LA;B;	C;F;LA;B;
Monitor	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
MIS:	C;S;L;T2;B;	C;L;T2;B;	C;L;T2;B;	C;S;LA;B;	C;LA;B;	C;LA;B;
Mismatch	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
	,	,	,	,	Terminate Prot.	
CON:	C;S;L;T2;B;	C;L;T2;B;	C;L;T2;B;	C;S;LA;B;	C;LA;B;	C;LA;B;
Contact	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
FAT:	C;S;L;T2;B;RCm;	C;L;T2;B;RCm;	C;L;T2;B;RCm;	C;S;LA;B;RCm;	C;LA;B;RCm;	C;LA;B;RCm;
Fast Try	MIS;		MIS;	MIS;	MIS;	MIS;
FAC:	C;S;L;T2;B;RCm;	C;L;T2;B;RCm;	C;L;T2;B;RCm;	C;S;LA;B;RCm;	C;LA;B;RCm;	C;LA;B;RCm;
Fast	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
Contact	iviio,	IVIIO,	IVIIO,	IVIIO,	iviiO,	iviiO,
WRC:	C;S;RCm;L;T2;B;	C; RCm;L;T2;B;	C: RCm:L:T2:R:	C;S; RCm;LA;B;	C; RCm;LA;B;	C; RCm;LA;B;
	MIS;		MIS;	MIS;	MIS;	MIS;
KON:	C;RCm;DT;S;L;T2;	C·RCm·DT·L·T2·	C·RCm·DT·L·T2·	C·RCm·DT·S·LA·	C·RCm·DT·LA·R·	C·RCm·DT·LA·R·
Konnect	B;	B;	B;	B;	MIS:	MIS:
	MIS;	MIS;	MIS;	MIS;	,	,
REK:		C:RCm:DT:L:T2:	· ·	·	C:RCm:DT:LA:IT	C;RCm;DT;LA;IT;
Re_Konnect		IT;B;	IT;B;	IT;B;	;B;	B;
_	MIS;	MIS;	MIS;	MIS;	MIS;	MIS;
SOS:	C;RCm;S;L;T2;IT;	C;RCm;L;T2;IT;	C;RCm;L;T2;IT;	C;RCm;S;LA;IT;	C;RCm;LA;IT;B;	C;RCm;LA;IT;B;
Sync_Lost	B;	B;	B;	B;	MIS;	MIS;
	MIS;	MIS;	MIS;	MIS;	In_Call_Mod	
OPE:				NoAc;	NoAc;	
Operation				OPE;	OPE;	
				Trans Error?	Trans Error?	
FAI:	NoAc;	NoAc;	NoAc;	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;	FAI;	FAI;	FAI;
TT:					<u>C;B;</u>	<u>C;B;</u>
TFO Term					TT;	<u>TT;</u>
			•	•	•	

Table 10.6-7 AMR Case: TFO_TRANS, TFO_ACK, RC_ack

Event:	TFO_TRANS	TFO_ACK	RC_ack
Number:	30	31	32
Condition:	Luc == AMR	A_TP	
&	DCh==LCh	Dsig==Lsig	
Comment:		Good Sig	BTS has steered the mode.
Common.		Immediate TFO possible	Dromas stoored the mede.
State:		personal of personal of	
NAC:			NoAc;
Not_Active			NAC;
WAK:			NoAc;
Wakeup			WAK;
vvakeup			WAIX,
FIT:	NoAc	C.L.D.C. A.C.K.T4	NoAc;
	NoAc; FIT;	C;U;RCi;ACK;T1; WRC;	FIT;
First_Try	Wait for Frame	Typical;	[[[]]]
000			N
COR:	NoAc;	C;U;RCi;ACK;T1;	NoAc;
Continuous	COR;	WRC;	COR;
Retry	Wait for Frames	Typical	
PER:	NoAc;	C;F;S;REQ;	NoAc;
Periodic	PER;	COR;	PER;
Retry	Wait for Frames	Rare case, test	
MON:	NoAc;	C;F;S;REQ;	NoAc;
Monitor	MON	FIT;	MON;
	Wait for Frames	Rare case, test	
MIS:	NoAc;	C;F;S;REQ;	NoAc;
Mismatch	MIS;	COR;	MIS;
	Wait for Frames	Rare case, test	
CON:	C;RCi;ACK;T1;	C;RCi;ACK;T1;	NoAc;
Contact	WRC;	WRC;	CON;
	Missed Ack	Typical	,
FAT:	NoAc;	C;REQ;RCm;	NoAc;
Fast	FAC:	COR;	FAT;
Try	Wait for Frames	Safe way	' ' ' '
FAC:	NoAc;	C;REQ;RCm;	NoAc;
Fast	FAC;	COR;	FAC;
Contact	Wait for Frames	Safe way	1 AO,
			0. 7.07.7.74
WRC <u>:</u>	NoAc;	NoAc;	C; T;BT;T;T1;
Wait_RC	WRC;	WRC;	KON;
			Typical
KON:	NoAc;	NoAc;	NoAc;
Konnect	KON;	KON;	KON;
	Typical: wait	Typical: wait	
REK:	NoAc;	C;DT;REQ;IT;B;T1	NoAc;
Re_Konnect	REK;	COR;	REK;
	Wait for Frames		
SOS:	NoAc;	C;IT;REQ;B;T1	NoAc;
Sync_Lost	SOS;	COR;	SOS;
	Wait for Frames	Contact is back	
OPE:	NoAc;		NoAc;
Operation	OPE;		OPE;
	Typical in HO		
FAI:	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;
		,	
TT:			NoAc;
TFO_Term			TT;
L	I	I	

Table 10.6-8 and Handover_Soon

Event:	Handover_Soon	Handover_Soon
Number:	35	36
Condition:	(NA_TP A_TP)	TM
Comment:	Local hand-over	Local hand-over
_	future parameters	future parameters
State:		
NAC:		
Not_Active		
WAK:		
Wakeup		
FIT:	C;	C;
First_Try	NAC;	NAC;
COR:	C;	C;
Continuous Retry	NAC;	NAC;
PER:	C;	C;
Periodic Retry	NAC;	NAC;
MON:	C;	C;
Monitor	NAC;	NAC;
MIS:	C;	C;
Mismatch	NAC;	NAC;
CON:	C;	C;
Contact	NAC;	NAC;
FAT:	C;RCm;	C;RCm;
Fast Try	NAC;	NAC;
FAC:	C;RCm;	C;RCm;
Fast	NAC;	NAC;
Contact	,	,
WRC <u>:</u>	C;RCm;	C;RCm;
Wait_RC	NAC;	NAC;
KON:	RCh;	C;RCm;DT;
Konnect	KON;	NAC;
REK:	RCh;	C;RCm;DT;IT;
Re_Konnect	REK;	NAC;
SOS:	RCh:	C;RCm;IT;
Sync_Lost	SOS;	NAC;
OPE:	RCh;	C;RCm;DT; IT ; <u>T1;</u>
Operation	OPE;	NACTT;
FAI:		
Failure		
TT:	NoAc;	NoAc;
TFO Term	TT;	TT;
<u> </u>	1	1

Table 10.6-9: Mismatching TFO_TRANS and TFO Frames

Event:	TFO_TRANS	TFO_Frame	TFO_Frame
Number:	37	38	39
Condition:	DCh!=LCh	Mismatch_1	Mismatch_2
Comment:	Mismatch of channel type	Mismatch for one or two TFO Frames	Continued Mismatch
State:			
NAC:			
Not_Active			
WAK:			
Wakeup			
FIT:	C;U;L;T2;B;	NoAc;	C;U;L;T2;B;
First_Try	MIS; HO?	FIT; HO? be tolerant	MIS; Typical in HO
COR:	C;U;L;T2;B;	NoAc;	C;U;L;T2;B;
Continuous Retry	MIS;	COR; Call Forw?	MIS;
PER:	C;F;L;T2;B;	NoAc:	C;F;L;T2;B;
Periodic	MIS;	PER;	MIS;
Retry		Call Forw?	
MON:	C;F;L;T2;B;	NoAc;	C;F;L;T2;B;
Monitor	MIS;	MON Call Forw?	MIS;
MIS:	C;L;T2;B;	NoAc;	C;L;T2;B;
Mismatch	MIS;	MIS; Call Forw?	MIS;
CON:	C;L;T2;B;	NoAc;	C;L;T2;B;
Contact	MIS;	CON;	MIS;
FAT:	C;L;T2;B;RCm;	NoAc;	C;L;T2;B;RCm;
Fast Try	MIS;	FAT;	MIS;
FAC:	C;L;T2;B;RCm;	NoAc;	C;L;T2;B;RCm;
Fast Contact	MIS;	FAC;	MIS;
WRC:	C;RCm;L;T2;B;	NoAc;	C; RCm;L;T2;B;
Wait_RC	MIS;	WRC;	MIS;
KON:	C;RCm;DT;L;T2;B;	NoAc;	C;RCm;DT;L;T2;B;
Konnect	MIS;	KON;	MIS;
REK:	C;RCm;DT;L;T2;IT;B;	NoAc;	C;RCm;DT;L;T2;IT;B;
Re_Konnect	MIS;	REK;	MIS;
sos	C;RCm;L;T2;IT;B;	NoAc;	C;RCm;L;T2;IT;B;
Sync_Lost	MIS;	SOS;	MIS;
OPE:	NoAc;	NoAc;	C;RCm;DT;L;T2;IT;B;
Operation	OPE;	OPE;	MIS;
-	Ignore?	Hard HO?	Hard HO into TFO
FAI:	NoAc;	NoAc;	NoAc;
Failure	FAI;	FAI;	FAI;
TT:			
TFO_Term			

Table 10.6-10: Local Events, TFO_FILL, TFO_NORMAL

Event:	New_Local_Codec_List	Data_Call	TFO_FILL	TFO_NORMAL
Number:	40	41	42	43
Condition:				
&				
Comment:	From RAN	In Call Modif.	Ignore	Ignore
		Stop TFO (see		alternative:
State:		TFO_Disable)	Filler	Soft Reset
NAC:	NoAc;	NoAc;		
Not_Active	NAC;	NAC;		
WAK:	NoAc;	NoAc;		
Wakeup	WAK;	NAC;		
FIT:	NoAc;	C;N;	NoAc;	NoAc;
First_Try	FIT;	NAC;	FIT;	FIT;
	Update loc. Par.		,	,
COR:	NoAc;	C;N;	NoAc;	NoAc;
	COR;			
Continuous Retry	COR;	NAC;	COR;	COR;
PER:	NoAc;	C;N;	NoAc;	NoAc;
Periodic	PER;	NAC;	PER;	PER;
Retry	,	,	,	,
MON:	NoAc;	C;N;	NoAc;	NoAc;
Monitor	MON	NAC;	MON	MON
MIS:	C;L;T2;	C;N;	NoAc;	NoAc;
Mismatch	MIS;	NAC;	MIS;	MIS;
Mismatch	direct info	NAC,	IVIIS,	IVIIO,
CON:	NoAc;	C;N;	NoAc;	NoAc;
Contact	CON;	NAC;	CON;	CON;
FAT:	NoAc;	C;N;RCm;	NoAc;	NoAc;
Fast	FAT;	NAC:	FAT;	FAT;
Try	, , ,	1.0.0,	, , , ,	, , , ,
FAC:	NoAc;	C;N;RCm;	NoAc;	NoAc;
Fast	FAC;	NAC;	FAC:	FAC;
Contact	1 40,	IVAO,	Ι ΑΟ,	1 70,
WRC:	No A or	C.NI.	NIo A or	No Ao
	NoAc; WRC:	C;N; NAC;	NoAc;	NoAc;
Wait_RC	WKC,	INAC,	WRC;	WRC;
KON:	NoAc;	C;DT;N;	NoAc;	NoAc;
Konnect	KON;	NAC;	KON;	KON;
Romiect	NOIN,	IVAO,	IXOIN,	IXOIN,
REK:	NI- A -	C.DT.IT.N.	NI - A -	No Asi
	NoAc;	C;DT;IT;N;	NoAc;	NoAc;
Re_Konnect	KEK,	NAC;	REK;	REK;
SOS:	NoAc;	C;IT;N;	NoAc;	NoAc;
Sync_Lost	sos;	NAC;	SOS;	SOS;
OPE:	L;T2;	C;DT;IT;N;	NoAc;	NoAc;
Operation	OPE;	NAC;	OPE;	OPE;
- Polation	direct info	,	J. <u>_</u> ,	
FAI:	NoAc;	C;	NoAc;	NoAc;
Failure	FAI;	NAC;	FAI;	FAI;
	,	exit from FAI		´
TT:	NoAc;	IT;N;		
TFO_Term	<u>TT;</u>	NAC;		
	1	l	·	l

Table 10.6-11: Special Events, Timeouts

Event:		T==0		Frame_Sync_Lost	
Number:	44	45	46	47	48
Condition:			n<3	n>2	
&				TFO Disabled	
Comment:	IPEs may become	Time-Out	start to send	Stop TFO Frames	
Ctata	unsynchronised		SYL already	if 3 Frames missing	
State:					
NAC:					
Not_Active					
VALA IZ.					
WAK: Wakeup					
vvakeup					
FIT:	U;N;				NoAc;
First_Try	MON:				FIT;
riist_iiy	PSTN Call				F11 ,
COR:	U;L1;T5;	C;N;REQ;			NoAs
	PER;	C,N,REQ, COR;			NoAc; COR;
Retry	at end of COR	Reset IPEs			COK,
PER:	NoAc;	L1;T5;			NoAc;
Periodic	PER;	PER;			PER;
Retry	r Lix,	Periodic Test			I LIX,
MON:		C;N;			
Monitor		MON;			
IVIOIIIIOI		IVIOIN,			
MIS:	NoAc;	N;B;	NoAc;	NoAc;	NoAc;
Mismatch	MIS;	MIS;	MIS;	MIS;	MIS;
iviisiriattii	typ Final state	List not Ack_ed!	IVIIO,	14110,	iviio,
CON:	REQ;				C;REQ;
Contact	COR;				COR;
00111001	can this occur?				
FAT:	REQ;RCm;		NoAc;	NoAc;	C;REQ;RCm;
Fast	COR;		FAT;	FAT;	COR;
Try	fast HO failed		typical in HO	typical in HO	fast HO failed
FAC:	REQ;RCm;		NoAc;	NoAc;	C;REQ;RCm;
Fast	COR;		FAC;	FAC;	COR;
Contact	fast HO failed		typical in HO	typical in HO	fast HO failed
WRC:	C;RCm;	C;RCm;			C;RCm;REQ;
Wait_RC	FAI;C; T;BT;T;T1;	FAI;C; T;BT;T;T1;			COR:
	KON;	KON;			,
	Missing RC_Ack	Missing RC_Ack			
KON:	NoAc;	C;RCm;DT;N;			C;RCm;DT;REQ;T1;
Konnect	KON;	FAI;			COR;
	may happen	Misbehaviour!			after Timeout: N
REK:	NoAc;	C;RCm;DT;N;IT;B;			C;RCm;DT;REQ;IT;B;T1;
Re_Konnect		FAI;			COR;
	may happen	Misbehaviour!			after Timeout: N
SOS:	RCm;REQ;IT;B;T1;			NoAc;	C;RCm;REQ;IT;B;T1;
Sync_Lost	COR;			SOS;	COR;
	after Timeout: N			wait for Runout	after Timeout: N
OPE:	NoAc;	B;	SYL1;	C;DT;SYL;	NoAc;
Operation	OPE;	OPE;	OPE;	SOS;	OPE;
	typ Final event	List not Ack_ed!	1: Alarm, go on	2: Alarm, stop!	Typ Final event
FAI:	NoAc;				NoAc;
Failure	FAI;				FAI;
	typical				don't trust!
	NoAc;	IT;N:	NoAc;	IT;N;	NoAc;
TT:	1 10/ 10,				
TT: TFO_Term	<u>TT;</u>	NAC;	TT;	NAC;	TT;

Table 10.6-11b: Special Events, Timeouts (continuation)

Event:	Frame_Sync_Lost
Number:	57
Condition:	n>2
<u>&</u>	TFO Enabled
	Stop TFO Frames
Comment:	
Ctata	if 3 Frames missing
State:	
NAC:	
Not Active	
WAK:	
Wakeup	
EIT.	
FIT:	
First_Try	
COR:	
Continuous	
Retry	
PER:	
Periodic	
Retry	
MON:	
Monitor	
MIC.	No Aou
MIS:	NoAc;
Mismatch Mismatch	MIS;
CON:	
Contact	
FAT:	NoAc;
Fast	FAT:
	typical in HO
Try	
FAC:	NoAc;
<u>Fast</u>	FAC;
Contact	typical in HO
WRC:	IT;
Wait RC	WRC;
Wait_rto	WITO,
KON	
KON:	
Konnect	
REK:	
Re Konnect	
1.0	
000	N. A.
SOS:	NoAc;
Sync_Lost	SOS;
	wait for Runout
OPE:	C;DT;SYL;
Operation	SOS;
 	2: Alarm, stop!
FAI:	
<u>Failure</u>	
TT:	C;RCm;B;
TFO_Term	MON;
11 0_161111	IVIOIN,

Table 10.6-12 Distant Config Frame for 3G systems (TC)

Event:	Distant_Config	Distant_Config	Distant_Config	Distant_Config
Number:		50	51	52
Condition:	(NA_TP A_TP)	TM	(NA_TP A_TP)	TM
&	Con_Req & TC	Con_Req & TC	Con_Ack & TC	Con_Ack & TC
Comment:	Config request Matching parameters	Config request TFO Mismatch	Config acknowledgement Matching parameters	Config acknowledgement TFO Mismatch
State:	iviatoring parameters	TFO IVIISITIATOR	Matering parameters	TFO MISMALON
NAC:				
Not_Active				
WAK:				
Wakeup				
FIT:	C;U;DUP;RCi;	C;RCm;B;	C;U;DUP;RCi;	C;RCm;B;
First_Try	FAT;	MIS;	FAT;	MIS;
I IISt_IIY	Same as 1. TFO_Frame	IVIIO,	Same as 1. TFO_Frame	IVIIO,
COR:	C;U;DUP;	C;RCm;B;	C;U;DUP;	C;RCm;B;
	FAT;	MIS;	FAT;	MIS;
Retry	Same as 1. TFO_Frame		Same as 1. TFO_Frame	
PER:	C;DUP;	C;RCm;B;	C;DUP;	C;RCm;B;
Periodic	FAT;	MIS;	FAT;	MIS;
Retry	Same as 1. TFO_Frame		Same as 1. TFO_Frame	
MON:	C;DUP;	C;RCm;B;	C;DUP;	C;RCm;B;
Monitor	FAT;	MIS;	FAT;	MIS;
	Same as 1. TFO_Frame		Same as 1. TFO_Frame	
MIS:	C;DUP;	C;RCm;B;	C;DUP;	C;RCm;B;
Mismatch	FAT;	MIS;	FAT;	MIS;
201	Same as 1. TFO_Frame	0.00	Same as 1. TFO_Frame	
CON: Contact	C;T;BT;T;T1; KON;	C;RCm;B; MIS;	C;T;BT;T;T1; KON;	C;RCm;B; MIS;
Contact	Same as 1. TFO_Frame	IVIIO,	Same as 1. TFO_Frame	IVIIG,
FAT:	NoAc;	C;RCm;B;	NoAc;	C;RCm;B;
Fast	FAT;	MIS;	FAT;	MIS;
Try	Same as 1. TFO_Frame		Same as 1. TFO_Frame	,
FAC:	C;BT;T;L;T2;AT;B;	C;RCm;B;	C;BT;T;L;T2;AT;B;	C;RCm;B;
Fast	OPE;	MIS;	OPE;	MIS;
Contact	Same as 1. TFO_Frame		Same as 1. TFO_Frame	
WRC:	NoAc;	C;RCm;B;	NoAc;	C;RCm;B;
Wait_RC	WRC;	MIS;	WRC;	MIS;
KON:	RCs;CA1;AT;L;T2;B;	C;RCm;CA;DT;B;T1;	RCs;AT;L;T2;B;	C;RCm;DT;B;T1;
Konnect	OPE; Same as 1. TFO_Frame	MIS;	OPE; Same as 1. TFO_Frame	MIS;
REK:	RCs;CA1;AT;L;T2;B;	C;RCm;CA;DT;IT;B;T1;	_	C;RCm;DT;IT;B;T1;
Re_Konnect		MIS;	OPE;	MIS;
	Same as 1. TFO_Frame		Same as 1. TFO_Frame	, ,
SOS:	C;RCs;CA1;BT;T;L;T2;B;	C;RCm;CA;DT;IT;B;T1;	_	C;RCm;DT;IT;B;T1;
Sync_Lost	OPE;	MIS;	OPE;	MIS;
] -	Same as 1. TFO_Frame		Same as 1. TFO_Frame	
OPE:	RCs;CA1;	C;RCm;CA;DT;IT;B;T1;		C;RCm;DT;IT;B;T1;
Operation	OPE;	MIS;	OPE;	MIS;
	Same as 1. TFO_Frame		Same as 1. TFO_Frame	
FAI:				
Failure				
TT.	D.	D.	D.	D.
TFO_Term	<u>B;</u> TT;	<u>B;</u> TT;	<u>B:</u> TT;	<u>B;</u> TT;
11 0_161111	11,	11,	11,	
	<u> </u>	1	I	1

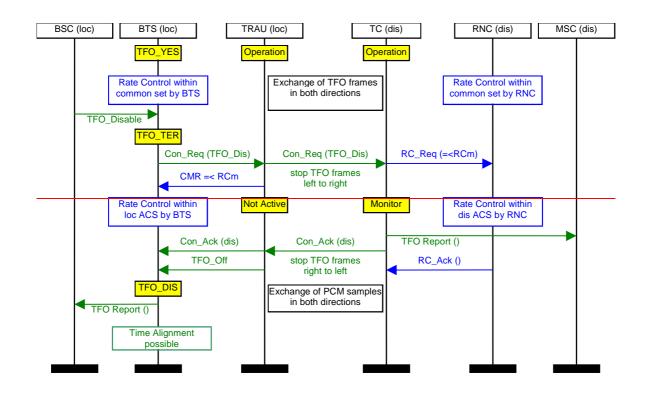
Table 10.6-13 Distant Config Frame for GSM systems (TRAU) and Distant_Disable

Event:	Distant_Config	Distant_Config	Distant_Config	Distant_Disable
Number:		54	55	56
Condition:	(NA_TP A_TP)	TM	TM	
&	TRAU	Con_req & TRAU	Con_Ack & TRAU	
Comment:	Config req or Config ack	Config request	Config acknowledgement	Distant side has disabled
_	Matching parameters	TFO Mismatch	TFO Mismatch	TFO
State:				
NAC:				
Not_Active				
WAK:				
Wakeup				
FIT:	C;U;DUP;RCi;	C;RCm;B;	C;RCm;B;	C;RCm;B;
First_Try	FAT;	MIS;	MIS;	MON;
_ ,	Same as 1. TFO_Frame	,	·	
COR:	C;U;DUP;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Continuous	FAT;	MIS;	MIS:	MON;
Retry	Same as 1. TFO_Frame		- 1	
PER:	C;DUP;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Periodic	FAT;	MIS;	MIS;	MON;
Retry	Same as 1. TFO_Frame	iviio,	iviio,	IVICIN,
		C.D.C. D.	C.D.CD:	C-DCD:
MON: Monitor	C;DUP;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Monitor	FAT;	MIS;	MIS;	MON;
	Same as 1. TFO_Frame			
MIS:	C;DUP;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Mismatch	FAT;	MIS;	MIS;	MON;
	Same as 1. TFO_Frame			
CON:	C;T;BT;T;T1;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Contact	KON;	MIS;	MIS;	MON;
	Same as 1. TFO_Frame			
FAT:	NoAc;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Fast	FAT;	MIS;	MIS;	MON;
Try	Same as 1. TFO_Frame	,	·	· ·
FAC:	C;BT;T;L;T2;AT;B;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Fast	OPE;	MIS;	MIS;	MON;
Contact	Same as 1. TFO_Frame	-,	-,	- '
WRC:	NoAc;	C;RCm;B;	C;RCm;B;	C;RCm;B;
Wait_RC	WRC;	MIS;	MIS;	MON;
wait_itto	WIKO,	iviio,	IVIIO,	WICH,
KON:	RCs;AT;L;T2;B;	C;RCm;CA;DT;B;T1;	C-DCm-DT-D-T4	C;RCm;CA;DT;B;T1;
Konnect	OPE;	MIS;	MIS;	MON:
Konnect	Same as 1. TFO_Frame	IVIIO,	IVIIG,	IVIOIN,
DEK.	=	O-DOOA-DT-IT-D-	0.0007.17.0.74	0.0004.07.17.0.74.
REK:	RCs;AT;L;T2;B;	C;RCm;CA;DT;IT;B;	C;RCm;DT;IT;B;T1;	C;RCm;CA;DT;IT;B;T1;
Re_Konnect		T1;	MIS;	MON;
200	Same as 1. TFO_Frame	MIS;	0.00 00 00	0.00 17.5.5
SOS:	C;RCs;BT;T;L;T2;B;	C;RCm;CA;DT;IT;B;	C;RCm;DT;IT;B;T1;	C;RCm;IT;B;T1;
Sync_Lost	OPE;	T1;	MIS;	MON;
	Same as 1. TFO_Frame	MIS;		
OPE:	RCs;	C;RCm;CA;DT;IT;B;	C;RCm;DT;IT;B;T1;	C;RCm;CA;DT;IT;B;T1;
Operation	OPE;	T1;	MIS;	MON;
	Same as 1. TFO_Frame	MIS;		
FAI:				
Failure				
TT:	<u>B;</u>	<u>B;</u>	B;IT;N;	B;IT;N;
TFO_Term	<u>TT;</u>	TT;	NAC;	NAC;
L	L	1	1	<u>l</u>

G.3 TFO_Disable during Operation

G.3.1 TFO_Disable - passive partner: UMTS

The following protocol flow shows TFO_Disable, where UMTS is the passive partner.



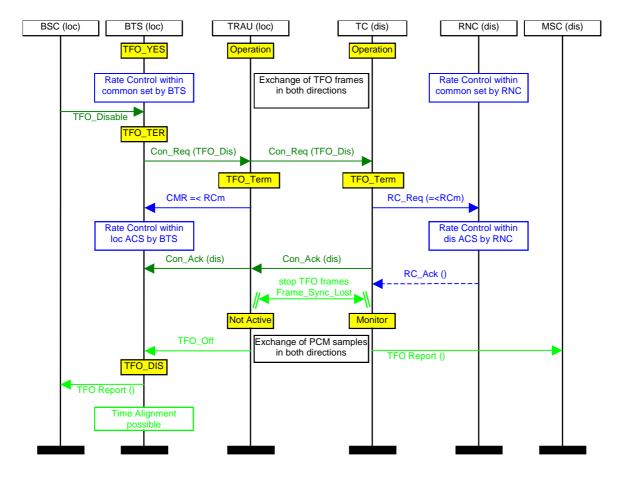
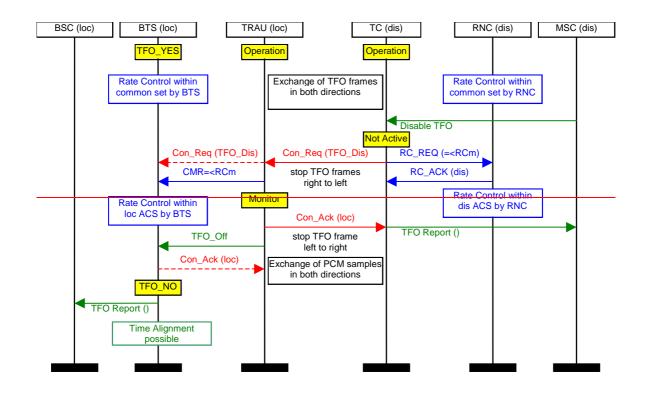


Figure G.3.1-1: TFO_Disable during operation – passive partner: UMTS

G.3.2 TFO_Disable – passive partner: GSM

The following protocol flow shows TFO Disable, where GSM is the passive partner.



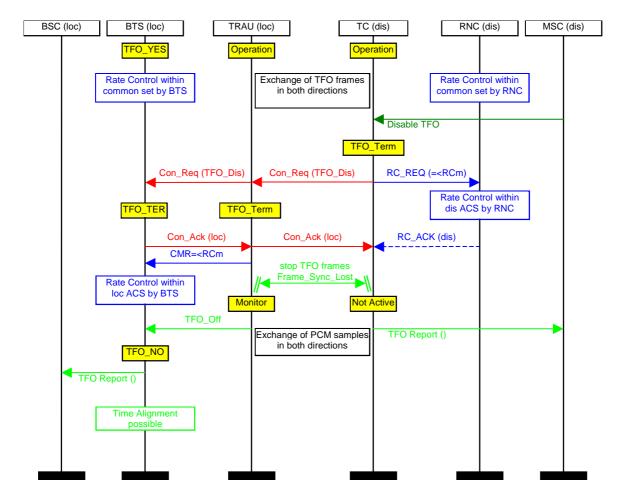


Figure G.3.2-1: TFO_Disable during operation - passive partner: GSM

Note that the TRAU answers the Con_Req (TFO_Disable) directly and stops sending TFO Frames immediately after Con_Ack (loc). The Con_Ack (loc) from the BTS is terminated within the TRAU.