Technical Specification Group Services and System Aspects *TSGS#18(02)0690*
Meeting #18, New Orleans, USA, 9 - 12 December 2002

Source: **TSG-SA WG4**

Title: **CRs to TS 26.103 - Corrections (Release 5)**

Document for: **Approval**

Agenda Item: **7.4.3**

The following CRs, agreed at the TSG-SA WG4 meeting #23, are presented to TSG SA #18 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.103	021	1	Rel-5	Correction of uplink SCR activation for UMTS AMR	F	5.3.0	S4	TSG-SA WG4#23	S4-020625
26.103	022		Rel-5	Correction to the Codec ID Table	F	5.3.0	S4	TSG-SA WG4#23	S4-020597

CR-Form-v7

CHANGE REQUEST

| ⌘ | **26.103** CR **021** | ⌘ **rev** | **1** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

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

Title: ⌘	Correction of uplink SCR activation for UMTS AMR	
Source: ⌘	TSG SA WG4	
Work item code: ⌘	AMR	***Date:*** ⌘ 10/12/2002
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

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

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

Reason for change: ⌘	No signaling exists in order to activate uplink SCR. Furthermore, the network is not mandated to allocate the appropriate RABs in order to enable the UE to enable the uplink SCR operation (transmission of SID frames…). Three alternatives may be adopted: - to define new signaling - or leave the activation free to the UE - or to always activate the uplink SCR The third alternative is retained.
Summary of change: ⌘	It is stated that the uplink SCR operation is always activated and not controlled by the network for UMTS AMR and UMTS AMR2 codec types.
Consequences if not approved: ⌘	If the uplink SCR is activated and the RAB do not support the corresponding AMR frames types (SID frames…) then the system will not work.

Clauses affected: ⌘	5.4

	Y	**N**	
Other specs affected: ⌘	**X**		Other core specifications ⌘ TS 26.093, TS 26.102
		X	Test specifications
		X	O&M Specifications

Other comments: ⌘	

5.4   Five Adaptive Multi-Rate Codec Types (FR AMR, HR AMR, UMTS AMR, UMTS AMR2, OHR AMR)

The Adaptive Multi-Rate Codec algorithm is applied in GERAN-GMSK, GERAN-8PSK and UTRAN in five different Codec Types.

The Codec IDentification (CoID) codes are defined to be:

FR_AMR_CoID   := 0x0000.0011.
HR_AMR_CoID   := 0x0000.0100.
UMTS_AMR_CoID   := 0x0000.0101.
UMTS_AMR_2_CoID := 0x0000.0110.
OHR_AMR_CoID   := 0x0000.1011.

The AMR may have several additional parameters. These parameters are optional at originating side, but mandatory for the terminating side:

Active Codec Set, ACS: eight bits.

For the FR AMR and the OHR AMR up to four out of the eight modes may be selected by setting the corresponding bits to "1";

In HR AMR only four out of the lower six modes can be selected;

For the UMTS AMR2 up to all eight modes may be selected.

If the ACS is not specified at originating side, then all modes are supported there.

If ACS is not provided, then SCS and MACS can not be provided as well.

Supported Codec Set, SCS: eight bits.

In FR AMR, OHR AMR, and UMTS AMR2 up to eight modes may be selected by setting the corresponding bits to "1".

In HR AMR only the lower six modes may be selected.

If the SCS is not specified at originating side, then all modes are supported there.

If SCS is not provided, then MACS cannot be provided as well.

Maximal number of Codec Modes, MACS: three bits.

For the FR AMR, the HR AMR and the OHR AMR one to four Codec Modes are allowed within the ACS.

Coding: "001: one, "010": two, "011": three, "100": four Codec modes allowed.

For the UMTS AMR2 one up to eight Codec Modes are allowed within the ACS.

Coding: "001: one, "010": two, … "111": seven, "000" eight Codec modes allowed.

If MACS is not specified at originating side, then the maximum of modes is supported there.

Optimisation Mode for ACS , OM: one bit.

Coding: "0": Optimisation of the ACS not supported, "1": Optimisation of the ACS supported.

The Optimisation Mode indicates in TFO, whether the sending side supports the modification (optimisation) of its

ACS for the needs of the distant side. This parameter is necessary in UMTS OoBTC to support TFO in "transcoders at the edge" scenarios. In case the OM is set to "not supported" the offered ACS cannot be altered.

Only Rate Control can then be used to restrict the modes within the ACS.

The use of the Optimisation Mode parameter for TrFO is defined in 3GPP TS 23.153 [9].

The Length Indicator field (LI) is set to 3, 4, 5 or 6 at originating side, depending on how many parameters are specified. The terminating side shall return the selected Codec with a full set of parameters. Hence LI shall be set to 6 always by the terminating side. If any node in the path from originating side to terminating side does not support the parameter set offered by the originating side, it may restrict it. If necessary the missing, optional parameter octets may have to be inserted then.

The "Single Codec" information element consists of 5 to 8 octets in case of the AMR Codec Types (table 5.4):

Table 5.4: Coding of "Single Codec" for the Adaptive Multi-Rate Codec Types

Octet	Parameter	MSB 8	7	6	5	4	3	2	1 LSB
1 m	Single Codec	Single Codec (see ITU-T Q.765.5)							
2 m	Length Indication	6							
3 m	Compat. Info	Compatibility Information							
4 m	OID	ETSI OID (See ITU-T Q.765.5 [6])							
5 m	CoID	FR_AMR_CoID, HR_AMR_CoID, UMTS_AMR_CoID, UMTS_AMR_2_CoID, OHR_AMR-CoID							
6 o	ACS	12.2	10.2	7.95	7.40	6.70	5.90	5.15	4.75
7 o	SCS	12.2	10.2	7.95	7.40	6.70	5.90	5.15	4.75
8 o	OM, MACS	(spare)	(spare)	(spare)	(spare)	OM		MACS	

with "m" = mandatory and "o" = optional

For information on GSM procedures (for exact details see GSM Recommendations):

The GSM AMR Codec Types comprise eight (Full Rate), respectively six (Half Rate) different Codec Modes: 12,2 … 4,75 kBit/s.

The active Codec Mode is selected from the Active Codec Set (ACS) by the network (Codec Mode Command) with assistance by the mobile station (Codec Mode Request). This Codec Mode Adaptation, also termed Rate Control, can be performed every 40 ms by going one Codec Mode up or down within the ACS. The Codec Modes in uplink and downlink at one radio leg may be different. In Tandem Free Operation both radio legs (A and B) are considered for the optimal selection of the active Codec Mode in each direction (uplink A and then downlink B, respectively vice versa) by the "Distributed Rate Decision" algorithm. The worst of both radio legs determines the highest allowed Codec Mode, respectively the maximally allowed rate ("Maximum Rate Control"). All rate control commands are transmitted inband: on the radio interface, the BTS-TRAU interface and the TRAU-TRAU interface.

The Active Codec Set is configured at call setup or reconfigured during the call. It consists of one up to maximally four Codec Modes (MACS) at a given time, selected from the Supported Codec Set. The maximal number of Codec Modes and the Supported Codec Set may be constrained by the network to consider resources and radio conditions.
The Active Codec Sets in uplink and downlink are identical.
First, at start up of Tandem Free Operation, Active Codec Sets, the Supported Codec Sets, the MACSs and the OMs are taken into account to determine the optimal common Active Codec Set. In a later phase the Codec Lists of both radio legs may be taken into account to find the optimum configuration. For exact details see 3GPP TS 28.062. All configuration data and update protocols are transmitted inband.

The DTX scheme of the Adaptive Multi-Rate Codec Type marks with a specific SID_FIRST frame the end of a speech burst. SID_FIRST does not contain Comfort Noise parameters. This SID_FIRST starts the comfort noise generation with parameters that are calculated at receiver side (!) from the latest received seven speech frames. A DTX hangover period needs to be applied therefore at transmitter side before sending of this SID_FIRST.
Absolutely coded SID_UPDATE frames follow about every eighth frame (160 ms) in speech pauses. SID_UPDATE frames are sent independently of the cell´s TDMA frame structure and are related only to the source signal.
An ONSET frame (typically) precedes in uplink direction the beginning of a new speech burst. DTX on or off is defined by the network on a cell basis. The defined Tandem Free Operation allows the reception of GSM-AMR DTX information for the downlink direction in all cases.

Note: The DTX scheme of the Enhanced Full Rate Codec Type is not compatible with the DTX scheme of the Adaptive Multi-Rate Codec Type in Codec Mode 12.2 kBit/s, although the speech modes of these two Codec Types are bit exact identical.

Informative for terminals of R99 that support only UTRAN access ("UTRAN-only" terminals):
UTRAN-only terminals of R99 may either use UMTS AMR or UMTS AMR2 as default speech version in UTRAN access.

Normative for terminals that support GSM and UTRAN radio access ("dual-mode" terminals):
Dual-mode terminals of R99 and onwards shall use the UMTS AMR2 as the default speech version in UTRAN access. They need not to support the UMTS AMR, because the UMTS AMR2 in terminals is a fully compatible replacement.

Normative for all UMTS terminals of REL-4 and onwards: The UMTS AMR2 shall be the default speech version in UTRAN access in all terminals, UTRAN-only and dual-mode (GSM and UTRAN) of REL-4 and onwards.

For information on UMTS procedures (for exact details see 3GPP TS 28.062 (TFO) and 3GPP TS 23.153 (TrFO)):

The active Codec Mode is selected from the Active Codec Set (ACS) by the network. This Codec Mode Adaptation, also termed Rate Control, can be performed for the UMTS AMR every 20 ms by going to another Codec Mode within the ACS. For the UMTS AMR 2 this Codec Mode Adaptation can be performed every 20ms for the downlink traffic channel, but only every 40ms for the uplink radio channel. The UE selects at call setup one of the two possible phases for Codec Mode Adaptation (odd or even frames). During the call changes of the Codec Mode in uplink direction are only allowed in this selected phase. Rate Control commands received in downlink direction are considered at the next possible phase. By this definition the UMTS AMR 2 Codec Type is TFO and TrFO compatible to the FR AMR, HR AMR, OHR AMR, UMTS AMR and UMTS AMR 2 Codec Types.

The Codec Modes in uplink and downlink at one radio leg may be different. In Tandem Free Operation or Transcoder Free Operation both radio legs (A and B) are considered for the optimal selection of the active Codec Mode in each direction (uplink A and then downlink B, respectively vice versa) by a "Distributed Rate Decision" algorithm. The worst of both radio legs determine the highest allowed Codec Mode, respectively the maximally allowed rate. All rate control commands are transmitted inband on the Iu and Nb interfaces and out of band on the radio interface.

The Active Codec Set is configured at call setup or reconfigured during the call. It consists of one up to maximally eight Codec Modes (MACS) at a given time, selected from the Supported Codec Set. The maximal number of Codec Modes and the Supported Codec Set may be constrained by the network to consider resources and radio conditions.
The Active Codec Sets in uplink and downlink are typically identical.
At call setup the Originating Side sends the AMR parameter set (included in the Codec List). The Terminating side then selects a suitable ACS from the given information and sends it back. In case the terminating side does not support TrFO a transcoder is allocated in the path at a suitable position, preferably as close as possible to the terminating side. This transcoder may by inband signalling install a Tandem Free Operation after call setup. Then, at start up of Tandem Free Operation, both Active Codec Sets, the Supported Codec Sets, the MACSs and the OMs are taken into account to determine the optimal common Active Codec Set. In a later phase the Codec Lists of both radio legs may be taken into account to find the optimum configuration. All configuration data and update protocols are transmitted inband on the TFO interface, but out of band within the UMTS network. For information on Tandem Free Operation see 3GPP TS 28.062 and on Transcoder Free Operation see 3GPP TS 23.153.

The SCR scheme of the Adaptive Multi-Rate Codec Types mark with a specific SID_FIRST frame the end of a speech burst. SID_FIRST does not contain Comfort Noise parameters. This SID_FIRST starts the comfort noise generation with parameters that are calculated at receiver side (!) from the latest received seven speech frames. A DTX hangover period needs to be applied therefore at transmitter side before sending of this SID_FIRST.
Absolutely coded SID_UPDATE frames follow about every eighth frame (160 ms) in speech pauses. SID_UPDATE frames are sent independently of the cell´s timing structure and are related only to the source signal.
An ONSET frame does (typically) not exist in UMTS networks, but may be received in TFO from the distant partner. It marks the beginning of a speech burst. ~~"SCR on" is always defined by the network~~The uplink SCR operation is always activated for UMTS AMR and UMTS AMR2 codec types. The defined Tandem Free Operation and Transcoder Free Operation allows the reception of AMR SCR information for the downlink direction in all cases.

The SCR scheme of the UMTS AMR2 Codec Type is fully compatible to the SCR scheme of the UMTS AMR in UMTS and the DTX schemes of the FR AMR, HR AMR and OHR AMR Codec Types.

CR-Form-v5

CHANGE REQUEST

| ⌘ | **TS 26.103** CR **22** | ⌘ **rev** | **-** | ⌘ | Current version: | **5.3.0** | ⌘ |

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

Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network **X**   Core Network **X**

Title: ⌘	Correction to the Codec ID Table	
Source: ⌘	TSG SA WG4	
Work item code: ⌘	CORRECT	***Date:*** ⌘ 10 December 2002
Category: ⌘ **F**		***Release:*** ⌘ REL-5

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

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

Reason for change: ⌘	A Codec ID codeword is used twice, i.e. for OHR-AMR & Reserved for future use
Summary of change: ⌘	Removal of the codeword from the line "Reserved for future use"
Consequences if not approved: ⌘	A same codeword could be used for different codecs. This codec list is used in the CC signalling and this can create many interoperability issues.

Clauses affected: ⌘	6.3

Other specs affected: ⌘	☐ Other core specifications ⌘	
	☐ Test specifications	
	☐ O&M Specifications	

| ***Other comments:*** ⌘ | |

How to create CRs using this form:

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

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

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

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

6.3 Selected Codec Type

The Selected Codec Type is coded as shown in Table 6.3-1. The same coding is used also in 3GPP TS 28.062 [7].

Table 6.3-1: Coding of the selected Codec_Type (long form)

Bit 8…Bit 1 CoID	Codec_Type	Name
0000.0000	GSM Full Rate (13.0 kBit/s)	GSM FR
0000.0001	GSM Half Rate (5.6 kBit/s)	GSM HR
0000.0010	GSM Enhanced Full Rate (12.2 kBit/s)	GSM EFR
0000.0011	Full Rate Adaptive Multi-Rate	FR AMR
0000.0100	Half Rate Adaptive Multi-Rate	HR AMR
0000.0101	UMTS Adaptive Multi-Rate	UMTS AMR
0000.0110	UMTS Adaptive Multi-Rate 2	UMTS AMR 2
0000.0111	TDMA Enhanced Full Rate (7.4 kBit/s)	TDMA EFR
0000.1000	PDC Enhanced Full Rate (6.7 kBit/s)	PDC EFR
0000.1001	Full Rate Adaptive Multi-Rate WideBand	FR AMR-WB
0000.1010	UMTS Adaptive Multi-Rate WideBand	UMTS AMR-WB
0000.1011	8PSK Half Rate Adaptive Multi-Rate	OHR AMR
0000.1100	8PSK Full Rate Adaptive Multi-Rate WideBand	OFR AMR-WB
0000.1101	8PSK Half Rate Adaptive Multi-Rate WideBand	OHR AMR-WB
~~0000.1011~~ 1111.1110	reserved for future use.	
1111.1111	Reserved forMuMe dummy Codec Type. NOTE: codec not to be used across radio interface.	MuMe