3GPP TSG CN Meeting #27 **NP-050105**
9th - 11th March 2005. Tokyo, Japan.

Source: **CN3**

Title: **CRs to Rel-6 on Work Item "IMS"**

Agenda item: **9.12**

Document for: **APPROVAL**

Introduction:

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

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver	Work Item
N3-050152	29.163	060	1	F	Corrections to AMR codec parameters	Rel-6	6.5.0	IMS-CCR-IWCS

3GPP TSG-CN WG3 Meeting #35 **Tdoc ⌘ N3-050152**
Sydney, Australia. 14th - 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.163** **CR** **060** ⌘ **rev** **1** ⌘ Current version: **6.5.0** ⌘

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

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

Title:	⌘	Corrections to AMR codec parameters	
Source:	⌘	Lucent Technologies	
Work item code:	⌘	IMS-CCR-IWCS	***Date:*** ⌘ 05/02/2005
Category:	⌘	**F**	***Release:*** ⌘ Rel-6

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

Reason for change: ⌘ The IETF has recently drafted clarifications to the AMR codec parameters in RFC 3267 that differ from the assumed behavior in 29.163. Changes have also being introduced to 28.062, 26.103 and 23.153 in SA4 and CN4 to correct the handling of UMTS_AMR in OoBTC and TFO to assure proper interworking. Both sets of changes must be reflected in the AMR parameter translation procedures in 29.163. They are being handled in one CR because the changes are closely coupled.

Summary of change: ⌘

- The interpretation of the mode-change-period parameter is changed to reflect the current semantics described in draft-ietf-avt-rtp-amr-bis-01.txt.
- The mode-change-neighbor parameters are included in a manner consistent with draft-ietf-avt-rtp-amr-bis-01.txt.
- UMTS_AMR_2 and UMTS_AMR-WB are signaled with the GSM values for mode-change-period and mode-change-neighbor to help assure end-to-end interoperability with OoBTC and TFO.
- The translation rules are changed to be consistent with recent CRs to 28.062, 26.103 and 23.153 that require UMTS_AMR to be treated as incompatible with UMTS_AMR_2 and other AMR codecs. This change also helps to assure end-to-end interoperability with OoBTC and TFO.
- Some related text is reworded for clarity.
- References to RFC 3267 are left unchanged since the bis version is unlikely to be ready in time for Release 6. Changes introduced in this CR reflect clarifications to the usage of parameters already defined in RFC 3267. An additional change will be required when the bis version reaches RFC status to add the mode-change-capability parameter.

Consequences if not approved:	⌘	In certain configurations, the existing procedures will allow incompatible codecs to communicate with one another without transcoding, significantly impairing voice quality. In other configurations, the existing procedures will insert unnecessary transcoding between compatible codecs.

Clauses affected:	⌘	B.2.5.1, B.2.5.2			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

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

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

B.2.5.1 Codec parameters for 3GPP AMR-NB codecs

Table B.1 shows the correspondence between the codec format parameters in the Single Codec information element (TS 26.103 [57]) and the SDP for the 3GPP narrowband AMR codecs (RFC 3267 [23]).

Table B.1: Mapping between Single Codec subfields and SDP parameters for 3GPP AMR-NB codecs

Single Codec information element		SDP payload format parameters		
Codec IDentification	**ACS, SCS, OM, MACS**	**Payload Type number**	**Encoding name**	**Other Parameters** (NOTE1) (NOTE2)
~~HR_AMR~~	~~OM=0 or Selected Codec Type~~	~~dynamic~~	~~AMR~~	~~mode-set=values corresponding to ACS;~~ ~~mode-change-period=2~~
~~HR_AMR~~	~~(OM=1 or OM not present) and (Supported Codec List or Available Codec List)~~	~~dynamic~~	~~AMR~~	~~mode-set=select from values corresponding to ACS, SCS and MACS (NOTE 3);~~ ~~mode-change-period=2~~
FR_AMR or OHR_AMR or HR_AMR	OM=0 or Selected Codec Type	dynamic	AMR	mode-set=values corresponding to ACS; ~~mode-change-period=2~~(NOTE 3)
FR_AMR or OHR_AMR or HR_AMR	(OM=1 or OM not present) and (Supported Codec List or Available Codec List)	dynamic	AMR	mode-set=select from values corresponding to ACS, SCS and MACS (NOTE 3); ~~mode-change-period=2~~(NOTE 3)
UMTS_AMR	OM=0 or Selected Codec Type	dynamic	AMR	mode-set=values corresponding to ACS~~;~~ ~~mode-change-period omitted~~
UMTS_AMR	(OM=1 or OM not present) and (Supported Codec List or Available Codec List)	dynamic	AMR	mode-set=select from values corresponding to ACS, SCS and MACS (NOTE ~~3~~4)~~;~~ ~~mode-change-period omitted~~
UMTS_AMR_2	OM=0 or Selected Codec Type	dynamic	AMR	mode-set=values corresponding to ACS; ~~mode-change-period=1~~(NOTE 5)
UMTS_AMR_2	(OM=1 or OM not present) and (Supported Codec List or Available Codec List)	dynamic	AMR	mode-set=select from values corresponding to ACS, SCS and MACS (NOTE 3); ~~mode-change-period=1~~(NOTE 5)

NOTE 1: Table 1 of RFC 3267 [23] provides the correspondence between codec rates and AMR modes for use when generating the "mode-set" parameter. When all modes are selected for use, the "mode-set" parameter ~~should~~ shall not be included in SDP.

NOTE 2: SDP payload format configurations in this table with only one value in the "mode-set" parameter ~~should~~ shall not include the "mode-change-period" and "mode-change-neighbor" parameters.

NOTE 3: Payload types for FR_AMR, OHR_AMR and HR_AMR with more than one value in the "mode-set" parameter shall include the "mode-change-period=2" parameter and should include the "mode-change-neighbor=1" parameter.

NOTE ~~3~~4: RFC 3267 [23] does not currently provide a mechanism to signal the SCS, MACS or OM parameters in SDP, nor does it distinguish between the different AMR-NB codec types. Each AMR-NB codec type in the Supported Codec List or the Available Codec List with OM=1 should be translated into a list of SDP payload formats in priority order, where each includes a "mode-set" parameter with a unique value derived from the ACS, SCS and MACS. Each "mode-set" ~~shall~~ should correspond to a codec configuration that is compatible with the given codec type according to the compatibility rules defined in clauses 11 and 12 of TS 28.062 [58].

NOTE 5: Payload types for UMTS_AMR_2 should include the "mode-change-period=2" and "mode-change-neighbor=1" parameters, normally used for signalling GSM AMR codecs, to assure end-to-end interoperability with OoBTC and TFO. Its actual capabilities would otherwise be signalled without these two parameters.

Definitions:

Supported Codec List: contains the offered Codec Types and Configuration-possibilities of the node initiating codec negotiation in BICC (see also TS 23.153). The Supported Codec List is sent from the initiating node forward to the terminating node. The Supported Codec List corresponds to an SDP offer during codec negotiation..

Available Codec List: contains the offered Codec Types and Configuration-possibilities of the contiguous portion of the connection between initiating and terminating BICC nodes, including all intermediate nodes through the BICC network(s). The Available Codec List is sent from the BICC node terminating codec negotiation backward to the initiating node. The Available Codec List corresponds to information sometimes available in a first-round SDP answer. The Available Codec List might not represent an end-to-end view of the available Codec Types and Configuration-possibilities when traversing both BICC and SIP networks.

Selected Codec Type: is determined by the node terminating codec negotiation. It specifies exactly the Codec Type and one unique Codec Configuration for the call. The Selected Codec Type corresponds to the final SDP answer.

When translating from a Single Codec information element to the equivalent SDP payload format parameters, where either OM=0 (in the Supported or Available Codec List) or the information element is the Selected Codec Type, the SDP shall include a single payload type and any associated parameters from the corresponding row in Table B.1. When translating from a Single Codec information element to the equivalent SDP payload format parameters, where OM=1 in the Supported or Available Codec List, the SDP shall only include payload formats corresponding to Codec Configurations compatible with the offered ACS, SCS and MACS, according to Table B.1. Since the number of compatible payload formats can be large, implementations should select a reasonable subset of the higher-priority payload formats for inclusion in the SDP. When translating a list of Single Codec information elements into SDP, duplicate payload types (matching on all parameters) shall be removed.

The following guidelines shall apply when translating from an SDP payload format specification to a Single Codec information element:

- If there is no “mode-set” parameter for a payload format in the SDP and the SDP is to be translated into a Supported or Available Codec List, then the corresponding Single Codec subfields shall be OM=1, MACS=8, all SCS modes offered, and ACS modes offered. Alternatively it is sufficient to specify only the Codec Type (see below) and omit the other parameters.

- If there is no “mode-set” parameter for a payload format in an SDP answer ~~which~~that is to be translated into a Selected Codec Type, then the corresponding Single Codec subfields shall be derived from the ~~corresponding~~ payload type in the SDP offer (to which the SDP answer was sent in response).

- If there is a “mode-set” parameter for a payload format in the SDP, then the corresponding Single Codec subfields shall be OM=0 and ACS modes selected according to the value of “mode-set”. The SCS shall be set identical to the ACS and MACS shall be set to the number of modes in the ACS. If this “mode-set” does not represent a valid configuration for the Codec Type (determined by OoBTC procedures), then the ~~corresponding~~ payload format shall not be translated.

- If ~~“mode-change-period=2”~~ a payload format in an SDP offer ~~which~~that is to be translated into a Supported Codec List includes “mode-change-period=2”, then the Codec IDentification value for the corresponding Single Codec shall be FR_AMR.

- If ~~“mode-change-period=2”~~ a payload format in an SDP answer ~~which~~that is to be translated into a Selected Codec Type or Available Codec List includes “mode-change-period=2”, then the Codec IDentification value for the corresponding Single Codec shall be one of FR_AMR, HR_AMR, OHR_AMR or UMTS_AMR_2, if offered in the Supported Codec List.

- If ~~“mode-change-period=1”~~ a payload format in an SDP offer ~~which~~that is to be translated into a Supported Codec List does not include “mode-change-period=2”, then the Codec IDentification value for the corresponding Single Codec shall be UMTS_AMR~~_2~~.

- If ~~“mode-change-period=1”~~ a payload format in an SDP answer ~~which~~that is to be translated into a Selected Codec Type or Available Codec List does not include “mode-change-period=2”, then the Codec IDentification value for the corresponding Single Codec shall be one of UMTS_AMR_2, FR_AMR, HR_AMR, OHR_AMR or UMTS_AMR, if offered in the Supported Codec List.

~~- If there is no “mode-change-period” parameter in an SDP offer which is to be translated into a Supported Codec List, then the Codec IDentification value shall be UMTS_AMR.~~

~~- If there is no “mode-change-period” parameter in an SDP answer which is to be translated into a Selected Codec Type or Available Codec List, then the Codec IDentification value shall be UMTS_AMR, if allowed by OoBTC codec negotiation procedures. If this is not the case, then the corresponding payload format shall not be translated.~~

B.2.5.2 Codec parameters for 3GPP AMR-WB codecs

Table B.2 shows the correspondence between the codec format parameters in the Single Codec information element (TS 26.103 [57]) and the SDP for the 3GPP wideband AMR codecs (RFC 3267 [23]).

Table B.2: Mapping between Single Codec subfields and SDP parameters for 3GPP AMR-WB codecs

Single Codec information element		SDP payload format parameters		
Codec IDentification	**Config-WB-Code**	**Payload Type number**	**Encoding name**	**Other Parameters** (NOTE 1)
FR_AMR-WB or OHR_AMR-WB	0	dynamic	AMR-WB	mode-set=0,1,2~~;~~ ~~mode-change-period=2~~
~~OHR_AMR-WB~~	~~0~~	~~dynamic~~	~~AMR-WB~~	~~mode-set=0,1,2; mode-change-period=2~~
OFR_AMR-WB or UMTS_AMR-WB	0	dynamic	AMR-WB	mode-set=0,1,2 (NOTE ~~1~~2)
OFR_AMR-WB or UMTS_AMR-WB	1	dynamic dynamic dynamic	AMR-WB AMR-WB AMR-WB	mode-set=0,1,2 mode-set=0,1,2,8 mode-set=0,1,2,4 (NOTE ~~1~~2)
OFR_AMR-WB or UMTS_AMR-WB	2	dynamic	AMR-WB	mode-set=0,1,2,4 (NOTE ~~1~~2)
OFR_AMR-WB or UMTS_AMR-WB	3	dynamic dynamic dynamic	AMR-WB AMR-WB AMR-WB	mode-set=0,1,2,4 mode-set=0,1,2,8 mode-set=0,1,2 (NOTE ~~1~~2)
OFR_AMR-WB or UMTS_AMR-WB	4	dynamic	AMR-WB	mode-set=0,1,2,8 (NOTE ~~1~~2)
OFR_AMR-WB or UMTS_AMR-WB	5	dynamic dynamic dynamic	AMR-WB AMR-WB AMR-WB	mode-set=0,1,2,8 mode-set=0,1,2,4 mode-set=0,1,2 (NOTE ~~1~~2)

NOTE 1: Payload types for FR_AMR-WB, OHR_AMR-WB and OFR_AMR-WB shall include the "mode-change-period=2" parameter and should include the "mode-change-neighbor=1" parameter.

NOTE ~~1~~2: Payload types for UMTS_AMR-WB should include the "mode-change-period=2" and "mode-change-neighbor=1" parameters, normally used for signalling GSM AMR-WB codecs, to assure end-to-end interoperability with OoBTC and TFO. Its actual capabilities would otherwise be signalled without these two parameters.~~SDP payload format configurations corresponding to OFR_AMR-WB shall also include the "mode-change-period=2" parameter. SDP payload format configurations corresponding to UMTS_AMR-WB shall include the "mode-change-period=1" parameter when generating SDP from the Single Codec information element.~~

When translating from a Single Codec information element to the equivalent SDP payload format parameters, the SDP shall include a distinct payload type and any associated parameters for each row in the table that matches the Config-WB-Code parameter. For example, OFR_AMR-WB with Config-WB-Code=3 ~~shall~~ can generate three SDP payload types for AMR-WB, each including the "mode-change-period=2" parameter, the "mode-change-neighbor=1" parameter, and the "mode-set" parameter with value sets "0,1,2,4", "0,1,2,8", and "0,1,2", respectively. When translating a list of Single Codec information elements into SDP, duplicate payload types (matching on all parameters) shall be removed.

The following guidelines shall apply when translating from one or more SDP payload format specifications to a Single Codec information element:

- Payload formats that match except for different values of "mode-set" shall be represented with the fewest values of Config-WB-Code, while retaining the priority represented by the order of the payload formats in the SDP. For example, three SDP payload types for AMR-WB, each including the "mode-change-period=2" parameter, the "mode-change-neighbor=1" parameter, and the "mode-set" parameter with value sets "0,1,2,4", "0,1,2,8", and "0,1,2", respectively, ~~shall~~ will generate Config-WB-Code=3.

~~A payload format with no mode-set parameter shall be represented by a Config-WB-Code value of 1.~~

- If there is no "mode-set" parameter for a payload format in the SDP and the SDP is to be translated into a Supported or Available Codec List, then the corresponding Single Codec shall have a Config-WB-Code value of 1.

- If there is no "mode-set" parameter for a payload format in an SDP answer that is to be translated into a Selected Codec Type, then the corresponding Config-WB-Code value shall be derived from the payload type in the SDP offer (to which the SDP answer was sent in response).

- If ~~"mode-change-period=2"~~ a payload format in an SDP offer ~~which~~that is to be translated into a Supported Codec List includes "mode-change-period=2", then the Codec IDentification value for the corresponding Single Codec shall be OFR_AMR-WB.

- If ~~"mode-change-period=2"~~ a payload format in an SDP answer ~~which~~ is to be translated into a Selected Codec Type or Available Codec List, then the Codec IDentification value for the corresponding Single Codec shall be one of OFR_AMR-WB, FR_AMR-WB, OHR_AMR-WB or UMTS_AMR-WB, if offered in the Supported Codec List.

- If ~~"mode-change-period=1"~~ a payload format in an SDP offer ~~which~~that is to be translated into a Supported Codec List does not include "mode-change-period=2", then the ~~Codec IDentification value shall be UMTS_AMR-Wb~~payload format shall not be translated.

~~If "mode-change-period=1" in an SDP answer which is to be translated into a Selected Codec Type or Available Codec List, then the Codec IDentification value shall be one of UMTS_AMR-WB, OFR_AMR-WB, FR_AMR-WB or OHR_AMR-WB, if offered in the Supported Codec List.~~

~~If there is no "mode-change-period" parameter in an SDP offer which is to be translated into a Supported Codec List, then the Codec IDentification value shall be UMTS_AMR-WB.~~

- ~~If there is no "mode-change-period" parameter in an SDP answer which is to be translated into a Selected Codec Type or Available Codec List, then the Codec IDentification value shall be UMTS_AMR-WB, if offered in the Supported Codec List. If this is not the case, then the corresponding payload format shall not be translated.~~