Technical Specification Group Services and System Aspects ***TSGS#11(01)0081***

Meeting #11, Palm Springs, CA, USA, 19-22 March 2001

Source: **TSG-SA WG4 Chairman**[1]

Title: **TSG-SA WG4 Status Report at TSG-SA#11**

Document for: **Information**

Agenda Item: **7.4.1**

Executive Summary

Since TSG-SA#10, TSG-SA WG4 (Codec Working Group) has held two plenary meetings: S4#15 (January 22nd – 26th, 2001) and S4#16 (February 26th – March 2nd, 2001). In addition, one ad hoc meeting on Packet Switched Multimedia has been held (February 8th – 9th, 2001).

AMR speech codec: Technical report of the Performance Characterisation of the AMR Speech Codec (TR 26.975) has been prepared and is brought for approval to TSG-SA#11. (This is the only pending Release 99 specification.)

AMR Wideband (AMR-WB) speech codec: A complete set of AMR-WB speech codec specifications of the 26-series (speech codec speech processing functions) have been finalised and are brought for approval to TSG-SA#11 (Rel-4). AMR-WB verification Phase has been carried out to analyse and verify, e.g., that the codec complexity and transmission delay meet the design constraints. AMR-WB Characterisation Phase for 3G and GSM GMSK channels is planned to be carried out from March until June, 2001. TR on Performance Characterisation of the AMR-WB Speech Codec is expected for approval at TSG-SA#12.

Tandem Free Operation (TFO): The AMR Tandem Free Operation (TFO) definition has been finalised. TS on In-band Tandem Free Operation of Speech Codecs (TS 28.062) is brought for approval to TSG-SA#11 (Rel-4).

Transparent End-to-end Packet Switched Streaming: The two specifications (TS 26.233 General Description, and TS 26.234 Protocols and Codecs) have been finalised and are brought for approval to TSG-SA#11 (Rel-4). As tasked at TAG-SA#10, both specifications have gone through a review process within S2. The comments and guidance from S2 have been incorporated into the specifications.

Packet Switched Conversational Multimedia Applications: The specification on Default Codecs (TS 26.235) has been finalised and is brought for approval to TSG-SA#11 (Rel-4).

Cellular Text Telephony Modem (CTM): The only remaining specification, Minimum Performance Specification (TS 26.231), has been finalised and is brought for approval to TSG-SA#11 (Rel-4).

CRs: Several CRs are brought for approval to TSs 02.53/05.53, 03.50, 06.73/26.073, 06.74/26.074, 26.102, 26.103, 26.110, 26.131, 26.132, 26.230, and TR 26.911.

[1] **Kari Järvinen**
Nokia
Email: kari.ju.jarvinen@nokia.com, Tel: +358 3272 5854, Mob: +358 50 555 0 999, Fax: +358 3272 5888

Note: Annex B (separate file) of this report contains a copy of the slides presentation to TSG-SA#11.

1. Introduction

Since TSG-SA#10, TSG-SA WG4 (Codec Working Group) has held two plenary meetings: S4#15 and S4#16. In addition, an ad-hoc meeting has been held to progress the Packet Switched Multimedia (PSM) work.

Meetings held:

TSG-S4#15:	Jan 22-26, 2001	hosted by Siemens in Munich, Germany
PSM ad-hoc #1:	Feb 8-9, 2001	hosted by Ericsson in Lund, Sweden
TSG-S4#16:	Feb 26 – Mar 2, 2001	hosted by ETSI in Sophia Antipolis, France

Calendar of next S4 meetings:

TSG-S4#17:	Jun 4-8, 2001	to be hosted by Nokia in Naantali, Finland
PSM ad-hoc #2:	Apr 9-10, 2001	to be hosted by Panasonic in Frankfurt, Germany
TSG-S4#18:	Sep 3-7, 2001	to be hosted by Frauenhofer Institute in Erlangen, Germany
TSG-S4#19:	Dec 3-7, 2001	(host open)

The input documents from S4 to TSG-SA#11 are contained in Tdocs SP-0100081 until SP-0100109. Annex A contains a list of all S4 input documents to TSG-SA#11. Annex B (in a separate file) contains a copy of the slides presentation of S4 progress report.

2. Progress in Work items

2.1 AMR speech codec (Release 1999)

TR on Performance Characterisation of the AMR Speech Codec (TR 26.975) has been finalised and is brought for approval in Tdoc SP-010097. (This is the only pending Release 99 specification.)

AMR Characterisation Tests in 3G channels were carried out during October - November 2000. These tests complement earlier AMR characterisation results obtained from the GSM AMR codec characterisation phase. Version 1.1.0 of TR 26.975 based on GSM AMR characterisation results was presented for information earlier (at TSG-SA#6).

The 3G AMR tests consisted of 2 main experiments divided into altogether 4 sub-experiments as shown in Table 2.1.1. The results from individual test laboratories were brought for information already at TSG-SA#10.

Experiment	Test Laboratory	Language	Noise Condition
1a	*Dynastat*	English	Clean
1b	*Lookheed Martin GT*	Korean	Clean
1c	*NTT-AT*	Japanese	Clean
2	*Arcon*	English	Car Noise at 15dB SNR

Table 2.1.1: Summary of the AMR 3G Characterisation Test conditions

Annex E of TR 26.975 contains the Characterisation results in 3G channels. The results show the performances of subsets of AMR modes under different conditions with combinations of link direction (uplink, downlink), path and speed profiles (vehicular 50 km/h, pedestrian 3 km/h, indoor 3 km/h) and QoS values (FER target values of 0.1%, 0.5% and 3%). The performances typically show no degradation of speech quality for Frame Erasure Rates (FER) under 1%.

Deliverable	Title	Latest version	Comment/Status	Approval requested at
TR 26.975	Performance Characterisation of the AMR Speech Codec	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010097. (Version 1.1.0 based on GSM AMR characterisation results has been presented for information earlier in Tdoc SP-000021 at TSG-SA#6.)	TSG-SA#11

Table 2.1.2: Status list of remaining AMR specifications

2.2 AMR Wideband (AMR-WB) Speech Codec (Release 4)

A full set of AMR-WB codec specifications of 26-series (speech codec speech processing functions) has been finalised and is brought for approval to TSG-SA#11 in Tdocs SP-010082 to SP-010091. All the specifications (except TS 26.174 "Test Sequences") were presented for information at TSG-SA#10.

SP-010082 3GPP TS 26.171 version 2.0.0 "AMR Wideband Speech Codec; General description" (Release 4)
SP-010083 TS 26.173 version 2.0.0 "AMR Wideband Speech Codec; C-source code" (Release 4)
SP-010084 TS 26.174 version 2.0.0 "AMR-WB speech codec; test sequences" (Release 4)
SP-010085 TS 26.190 version 2.0.0 "AMR Wideband Speech Codec; Transcoding Functions" (Release 4)
SP-010086 TS 26.191 version 2.0.0 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames" (Release 4)
SP-010087 TS 26.192 version 2.0.0 "AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels" (Release 4)
SP-010088 TS 26.193 version 2.0.0 "AMR Wideband Speech Codec; Source Controlled Rate operation" (Release 4)
SP-010089 TS 26.194 version 2.0.0 "AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels" (Release 4)
SP-010090 TS 26.201 version 2.0.0 "AMR Wideband Speech Codec; Speech Codec Frame Structure" (Release 4)
SP-010091 TS 26.202 version 2.0.0 "AMR-WB speech codec; interface to Iu and Uu" (Release 4)

The above 26-series specifications contain a full definition of the AMR-WB source coding including source controlled rate operation. The AMR-WB speech codec utilises the ACELP (Algebraic Code Excitation Linear Prediction) technology which is employed also in the AMR speech codec. The AMR-WB codec contains nine speech codec modes with bit-rates of 23.85, 23.05, 19.85, 18.25, 15.85, 14.25, 12.65, 8.85 and 6.6 kbit/s. All these modes are usable in 3G (and in GERAN 8-PSK Phase II channels currently under definition in TSG-GERAN). The seven lowest modes fit within the GSM Full-Rate transmission channel.

The complete set of 26-series specifications is finalised and ready for approval to Release 4. They contain a full definition of AMR-WB source coding functions and form a complete and useful entity as such. For the Packet Switched Multimedia work (TSs 26.234 and 26.235), AMR-WB codec specifications are already referenced and needed in Release 4. (Some concern was expressed at S4#16 on possible open issues in other WGs relating to network aspects of AMR-WB (service requirements, transport in network, legal interception). S4 feels that the AMR-WB codec 26-series specifications should be in Rel-4 in any case.)

Verification Phase to check some key characteristics of the AMR-WB codec has been carried out, with some complementing work still ongoing. The AMR-WB codec complexity and transmission delay have been verified to meet the design constraints. Items covered in the verification work include muting behaviour during bad frames, performance of comfort noise generation, performance with DTMF tones, channel coding performance during DTX and verification of the format of the C-code. No serious lacks have been found in the codec performance. Some corrections have been brought to the AMR-WB specifications as a result of the verification work.

The AMR-WB Characterisation Phase for 3G and GSM GMSK channels (Phase I) will be carried out during March – June, 2001. (Phase II covering use of AMR-WB in GERAN 8-PSK channels will be carried out later, when the 8-PSK channels are fully defined.) Characterisation Phase I test plan and processing plan have been finalised and were approved at S4#16. ARCON and LMGT (Lockheed Martin Global Telecommunications) will act as processing laboratories. The following listening laboratories have been identified: ARCON (American English), BT (British English), Dynastat (American English and Spanish), France Telecom (French), LMGT (American English), Nokia (Finnish), Nortel Networks (Canadian English), NTT-AT (Japanese), and T-Nova (German). A budget of 250 kEURO is available for the characterisation tests (funding from codec proponents that participated in the AMR-WB Selection Phase). The results of the characterisation and verification phases will be contained in TR on Performance Characterisation of the AMR-WB Speech Codec. This can be expected for approval at TSG-SA#12 (at the earliest).

The schedule for the Characterisation Phase I is as follows:

- Early March 2001: Formal contracts sent by ETSI to Processing/Listening Labs
- 16 March 2001: Source Material sent to Listening Labs
- 20 March 2001: Executable / Error Patterns sent to Processing Labs

- 20 April 2001: Processing Labs expected to complete Processing work
- 21 May 2001: Listening Labs expected to complete Listening work
- 25 May 2001: Tables with results to Technical Report Editor
- 30 May 2001: Report from Processing Lab / Listening Labs to S4 reflector

Deliverable	Title	Latest version	Comment/Status	Approval requested at
TS 26.171	AMR Wideband Speech Codec; General description	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010082. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010556.	TSG-SA#11
TS 26.173	AMR Wideband Speech Codec; C-source code	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010083. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010557.	TSG-SA#11
TS 26.174	AMR-WB speech codec; test sequences	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010084.	TSG-SA#11
TS 26.190	AMR Wideband Speech Codec; Transcoding Functions	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010085. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010558.	TSG-SA#11
TS 26.191	AMR Wideband Speech Codec; Error concealment of erroneous or lost frames	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010086. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010559.	TSG-SA#11
TS 26.192	AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010087. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010560.	TSG-SA#11
TS 26.193	AMR Wideband Speech Codec; Source Controlled Rate operation	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010088. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010561.	TSG-SA#11
TS 26.194	AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010089. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010562.	TSG-SA#11
TS 26.201	AMR Wideband Speech Codec; Speech Codec Frame Structure	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010090. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010563.	TSG-SA#11
TS 26.202	AMR-WB speech codec; interface to Iu and Uu	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010091. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010564.	TSG-SA#11
TR 26.xyz	AMR-WB Selection Phase Results	-	To be prepared based on Tdoc SP-000555 "Results of AMR Wideband (AMR-WB) Codec Selection Phase" presented at TSG-SA#10.	TSG-SA#12
TR 26.xyz	Wideband Speech Codec Performances Characterization	-	Characterisation tests planned for 1H01	TSG-SA#12 at the earliest

Table 2.2: Status list of AMR Wideband codec specifications

Wideband telephony needs to be included into the specifications of Terminal Acoustic Characteristics: Requirements (TS 26.131) and Test Secification (TS 26.132). Tdoc SP-010106 contains a proposed CR (Rel-4) to complement TS 26.131 by specifying acoustic requirements for wideband telephony. The requirements are generally taken from ITU-T Wideband Telephony Recommendations P.311 and P.314 with some modifications to ensure compatibility with 3G narrowband requirements. Tdoc SP-010107 contains a CR (Rel-4) to complement TS 26.132 and to describe methods for testing acoustic requirements of terminals supporting wideband telephony. Generally the same test methods as defined for narrowband are used for wideband.

AMR-WB codec types for 3G and GSM (UMTS_AMR-WB and FR_AMR-WB) are added in the Codec List specification (TS 26.103) in CR (Rel-4) contained in Tdoc SP-010104.

2.3 Tandem Free aspects for 3G and between 2G and 3G systems (Release 4)

The AMR Tandem Free Operation (TFO) definition has been finalised. Specification of In-band Tandem Free Operation of Speech Codecs (TS 28.062) is brought for approval at TSG-SA#11 in Tdoc SP-010096.

Version 1.0.0 was presented for information at TSG-SA#10. Since TSG-SA#10, the specification has been presented to CN4 and TSG-GERAN for review.

TFO is used to avoid the traditional double speech encoding/decoding in MS to MS (GSM), MS to UE (GSM/3G) or UE to UE (3G) call configurations. In a normal MS-MS call configuration the Speech Signal is first encoded in the originating MS, sent over the Air Interface, converted to A-law or μ-law G.711 in the local transcoder, carried over the fixed network, transcoded again in the distant transcoder, sent over the distant Air Interface and finally decoded in the terminating MS. In this configuration, the two speech codecs (coder/decoder pairs) are in "Tandem Operation".

The key inconvenience of a tandem configuration is the speech quality degradation introduced by the double transcoding. This degradation is usually more noticeable when the speech codecs are operating at low rates. When the originating and terminating connections are using the same speech codec, it is possible to transmit transparently the speech frames received from the originating MS to the terminating MS without activating the transcoding functions in the originating and terminating networks. This configuration is "Tandem Free Operation".

The key advantages of TFO are:

- Improvement in speech quality by avoiding the double transcoding in the network
- Possible savings on the inter-PLMN transmission links, which are carrying compressed speech compatible with a 16 kbit/s or 8 kbit/s sub-multiplexing scheme, including packet switched transmission
- Possible savings in processing power in the network equipment since the transcoding functions in the Transcoder Units are bypassed.
- Possible reduction in the end-to-end transmission delay

The TFO protocol (described in TS 28.062) provides the following services:

- Establishment of a transparent path between transcoders
- Provision of an In-band signalling link between transcoders
- Exchange of information on the active speech codec type and supported speech codec types at both ends of the call configuration
- Codec Mismatch Resolution
- Establishment and Maintenance of Tandem Free Operation when identical codec types are used at both ends of the call configuration
- Fast and seamless fall back to Tandem Operation in case of necessary or unexpected TFO interruption (i.e. activation of supplementary services)
- Support for cost efficient transmission

TS 28.062 defines Tandem Free Operation for the different Speech Codec Types used in GSM and 3G systems. This includes the GSM_FR, GSM_HR, GSM_EFR and FR_AMR, HR_AMR, UMTS_AMR, UMTS_AMR_2 codec types. The resolution of a possible codec mismatch is defined as an optional feature. A codec mismatch occurs when incompatible speech codecs are used at both ends of the call configuration at call set-up. The resolution consists in finding an optimal speech codec (speech codec types and/or configuration) on which TFO may be established. TFO cannot be activated until the codec mismatch is resolved. Once TFO is established, another optional feature, Codec Optimisation, may be triggered. This determines, if another Common Speech Codec Type/Configuration exists with the potential to provide better speech quality while operating in TFO.

TFO is activated and controlled by the Transcoder Units. The TFO protocol is fully handled and terminated in the Transcoder Units. For this reason, the Transcoder Units cannot be bypassed in Tandem Free Operation. This is the key difference with Transcoder Free Operation (TrFO) feature.

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 28.062	In-band Tandem Free Operation (TFO) of Speech Codecs	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010096. Version 1.0.0 was presented for information at TSG-SA#10 in Tdoc SP-000568.	TSG-SA#11

Table 2.3: Status list of TFO Specifications

To enable TFO between 3G and GSM, a new codec type (UMTS_AMR_2) is introduced in Codec List

(TS 26.103) in CR (Rel-4) in Tdoc SP-010104. This codec type is identical to UMTS_AMR, but the UE shall perform changes of the codec mode to uplink direction only every second frame (as in GSM). UMTS_AMR_2 shall be mandatory Codec Type from Release 4 onwards.

TFO Stage 1 and 2 descriptions have been updated through CRs (Rel-4) in Tdoc SP-010098. These complement the descriptions to include the AMR codec.

2.4 Transparent End-to-End Packet Switched Mobile Streaming Applications (Release 4)

Two specifications covering General Description (TS 26.233) and definition of Protocols and Codecs (TS 26.234) have been finalised and are brought for approval in Tdocs SP-010093 and SP-010094. Version 1.0.0 for both specifications was presented for information at TSG-SA#10.

As tasked at TSG-SA#10, the S4 work for both specifications has gone through a review process in S2 to cover especially any architectural issues. The review comments were received from S2 at S4#16 and they have been incorporated in the specifications presented now for approval. Other updates in the specifications since TSG-SA#10 include agreement of presentation layout (based on SMIL 2.0 Basic Language Profile), file format (MPEG-4 file format) and audio codec (recommendation to use MPEG-4 AAC Low Complexity object type with additional support of MPEG-4 AAC Long Term Prediction object type).

Release 4 Packet Switched Streaming contains a complete basic streaming service including session set-up and control protocols (based on RTSP with SDP presentation description), data transport protocols (based on RTP over UDP/IP and HTTP over TCP/IP), media codecs and scene description protocol (SMIL 2.0 Basic Language Profile with three additional modules), and interchange format with MMS (MPEG-4 file format). Default codecs are defined for speech, audio, video, still images, bitmap graphics, and text. For video coding, ITU-T H.263 baseline is the mandatory codec. Optional video codecs are ITU-T H.263 Profile 3 level 10, and ISO MPEG-4 Visual Simple Profile Level 0. For speech coding, the AMR (Adaptive Multi-Rate) codec is the mandatory codec. The AMR wideband speech codec is mandatory to be supported when wideband speech (working at 16 kHz sampling frequency) is supported. For audio, MPEG-4 AAC Low Complexity object type should be supported. In addition, the MPEG-4 AAC Long Term Prediction object type may be supported. ISO/IEC JPEG should be used for static images.

Release 4 is limited to downlink streaming (with a terminal as a streaming client). In Release 4, there is no explicit capability exchange, interworking with core network services or encryption or digital rights management. These, as well and additional compatible functionality, are planned to be added in a fully backwards compatible manner in later releases of the specifications. The content of features to be included Release 5 will be addressed in Packet Switched Multimedia Ad-Hoc meeting #2 (April 2001) and at the following S4#17 meeting (June 2001).

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 26.233	Packet-switched Streaming Services (PSS); General Description	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010093. Version 1.0.0 was presented for information at TSG-SA#10 in Tdoc SP-000565.	TSG-SA#11
TS 26.234	Packet-switched Streaming Services (PSS); Protocols and Codecs	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010094. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-000566.	TSG-SA#11

Table 2.4: Status list of specifications for Transparent End-to-End Packet Switched Mobile Streaming Applications

2.5 Multimedia Codecs and Protocols for Conversational Packet-Switched Services (Release 4/5)

Default Codecs specification (TS 26.235) has been finalised and is brought for approval to TSG-SA#11 in Tdoc SP-010095. Version 1.0.0 was presented for information at TSG-SA#10. Since TSG-SA#10, the main revisions have been in aligning the mandatory codecs to be the same as in Packet Switched Streaming (TS 26.234 in Tdoc SP-010094) and also including real time text conversation feature recommending support for ITU-T T.140.

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 26.235	Packet Switched Conversational Multimedia Applications; Default Codecs	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010095. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-000567.	TSG-SA#11
TR 26.xyz	Performance characterization of default codecs for PS conversational multimedia applications	-	-	TSG-SA#14
TS 26.xyz	Protocols for PS conversational multimedia applications	-	-	TSG-SA#14

Table 2.5: Status list of specifications for Multimedia Codecs and Protocols for Conversational Packet Switched Services

2.6 Cellular Text Telephone Modem for Global Text Telephony (GTT) (Release 4)

The following Cellular Text Telephone Modem (CTM) specifications are under the responsibility of S4: General Description (TS 26.226), Transmitter Bit Exact C-code (TS 26.230), and Minimum Performance Specification (TS 26.231).

TSs 26.226 and 26.230 were approved at TSG-SA#10. The only remaining specification, Minimum Performance Specification (TS 26.231), has been finalised and is brought for approval at TSG-SA#11 in Tdoc SP-010092. Some (mostly editorial) updates have been brought to the specification compared to version 1.0.0 presented for information at TSG-SA#10. The specification contains as attachment test scripts and test vectors. Also, a program to measure the character error rate is included.

CR (Rel-4) to TS 26.230 correcting a bug in the source code of the CTM receiver is brought for approval in Tdoc SP-010108.

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 26.226	GTT Cellular Text Telephone Modem; General Description	2.0.0	Presented for approval at TSG-SA#10 in Tdoc SP-000569.	(Approved at TSG-SA#10)
TS 26.230	GTT Cellular Text Telephone Modem; Transmitter C-code Description	2.0.0	Presented for approval at TSG-SA#10 in Tdoc SP-000570.	(Approved at TSG-SA#10)
TS 26.231	GTT Cellular Text Telephone Modem; Minimum Performance Specification	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010092. Presented for information at TSG-SA#10 in Tdocs SP-000571 and SP-000582.	TSG-SA#11

Table 2.6: Status list for GTT Specifications (under the responsibility of S4)

3. Maintenance of specifications

The following CR-documents (for the named specifications) are brought for approval:

SP-010098	CRs TS 02.53 and TS 03.53 on Extension of TFO to AMR (Release 4)
SP-010099	CRs TS 03.50 on Harmonisation of requirements on terminal acoustics in GSM and 3G (Release 4 and Release 5)
SP-010100	CRs to TS 06.73 and TS 26.073 on Corrections to AMR codec (R98, R99, Release 4)
SP-010101	CRs to TS 06.74 and TS 26.074 on Update of AMR codec test sequences after CRs to TS 06.73 and TS 26.073 (R98, R99, Release 4)
SP-010102	CRs to TS 06.77 on Addition of test plan and tidying (R99)
SP-010103	CRs to TS 26.102 on Introduction of TFO and TrFO (R99 and Release 4)
SP-010104	CRs to TS 26.103 on AMR-WB and TFO (Release 4)
SP-010105	CRs to TS 26.110 on Corrections and Support of mobile multi-link operation in 3G-324M (R99 and Release 4)
SP-010106	CRs to TS 26.131 on Harmonisation of acoustic requirements between 3GPP and GSM and WB acoustic requirements (R99 and Release 4)
SP-010107	CRs to TS 26.132 on Harmonisation of test methods for acoustics between 3GPP and GSM and Compatibility with testing wideband telephony transmission performance (R99 and Release 4)
SP-010108	CR to TS 26.230 on Bug fix in source code of the CTM receiver (Release 4)
SP-010109	CR to TR 26.911 on ITU-T V.80 support for 3G terminals (Release 4)

In the following, the CRs not directly related to the work in active work items (and not explained earlier in this report) are briefly described.

CRs to AMR Speech Codec

The CRs (R98/R99/Rel-4) in Tdoc SP-010100 bring corrections to the AMR C-code (TS 06.73/26.073) and CRs in Tdoc SP-010101 bring the respective changes into the Test Sequences (TS 06.74/26.074). Some clarifications and corrections are brought to Interface to Iu and Uu specification (TS 26.102) by CRs (R99/Rel-4) in Tdoc SP-010103.

CRs to 3G Audio-Visual Terminal Characteristics

Harmonisation of requirements on terminal acoustics in GSM and 3G is desirable to achieve a common acoustical specification for both GSM and 3G terminals. This is important for dual mode handsets. Otherwise, for dual mode 3G/GSM handsets two sets of non-equivalent requirements on handset acoustics would have to be met.

To achieve the harmonisation, two CRs (Rel-4, Rel-5) are brought to TS 03.50 ("Transmission Planning Aspects of the Speech Service in the GSM Public Land Mobile Network (PLMN) System") in Tdoc SP-010099. For dual mode 3G/GSM phones, some requirements are changed to match the 3G requirements. The harmonisation is carried out by replacing these requirements in the GSM specifications by references to the relevant 3G specifications. For single mode GSM terminals, only requirements that are equal in GSM and 3G are replaced with references to the relevant 3G specifications. For cases where the 3G requirements are different from the existing GSM requirements, slight modifications have been made. Type 1 ears are still allowed for GSM conformance testing in Rel-4 but not anymore in Rel-5.

Some sections in 3G specifications TS 26.131 (Terminal Acoustic Characteristics for Telephony; Requirements) and TS 26.132 (Terminal Acoustic Characteristics for Telephony; Test Specification) are updated for compatibility with GSM requirements. The CRs (R99) are contained in Tdocs SP-010106 and SP-010107.

CRs to GSM AMR Noise Suppression (AMR-NS)

The AMR Noise Suppression Test Plan (to compare performance against the Minimum Performance Requirements) has been finalised. This will be included into TS 06.77 (Minimum Performance Requirements for Noise Suppresser; Application to the AMR Speech Encoder). The test plan and some editorial corrections are brought to TS 06.77 in CRs (R99) in Tdoc SP-010102.

CRs to Circuit Switched Multimedia Codec

CRs (R99/Rel-4) to TS 26.110 on Corrections and Support of mobile multi-link operation in 3G-324M are brought for approval in Tdoc SP-010105.These bring corrections to the references and add support for multilink operation (according ITU H.324 Annex H), as optional feature, enabling higher bit-rates and multiple channel operation.

One CR (Rel-4) is brought to TR 26.911 in Tdoc SP-010109. This recommends the use of ITU-T V.80 in the DTE-DCE interface in case of non-integrated videophone terminal implementations with separate DTE

and DCE devices.

4. Miscellaneous

- All specifications under S4 responsibility have been agreed to be transferred to Release 4 (most will become 40+ specifications in Rel-4).
- The election of S4 Vice-Chairmen will be carried out at the next S4 meeting (S4#17 on 4-8 June, 2001). The period of the S4 Chairman is not yet expired.

5. Overview of S4 Progress in Release 4 work

The S4 work for Release 4 meets the targets set in the 3GPP Work Plan (version 010313). See section 6 for a full list of Release 4 specifications from S4.

Notes:

- For feature "Provisioning of IP-based multimedia services (Rel-5)", the specification TS 26.235 "Packet Switched Conversational Multimedia Applications; Default Codecs" should be included in Rel-4 instead of Rel-5. (In the approved S4 Work Item description this specification is targeted already for S4#10.)
- For some tasks, the need of S4 involvement is marked with uncertainty (e.g., "contact S4 or delete" in Bearer Independence and codec control issues in Enable bearer independent CS architecture). In these no actions have been requested from S4.

6. Approval requested

TSG-S4 requests TSG-SA#11 to:

1. Approve the following AMR-WB codec specifications (for Release 4):

a)	SP-010082	3GPP TS 26.171 version 2.0.0 "AMR Wideband Speech Codec; General description" (Release 4)
b)	SP-010083	3GPP TS 26.173 version 2.0.0 "AMR Wideband Speech Codec; C-source code" (Release 4)
c)	SP-010084	3GPP TS 26.174 version 2.0.0 "AMR-WB speech codec; test sequences" (Release 4)
d)	SP-010085	3GPP TS 26.190 version 2.0.0 "AMR Wideband Speech Codec; Transcoding Functions" (Release 4)
e)	SP-010086	3GPP TS 26.191 version 2.0.0 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames" (Release 4)
f)	SP-010087	3GPP TS 26.192 version 2.0.0 "AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels" (Release 4)
g)	SP-010088	3GPP TS 26.193 version 2.0.0 "AMR Wideband Speech Codec; Source Controlled Rate operation" (Release 4)
h)	SP-010089	3GPP TS 26.194 version 2.0.0 "AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels" (Release 4)
i)	SP-010090	3GPP TS 26.201 version 2.0.0 "AMR Wideband Speech Codec; Speech Codec Frame Structure" (Release 4)
j)	SP-010091	3GPP TS 26.202 version 2.0.0 "AMR-WB speech codec; interface to Iu and Uu" (Release 4)

2. Approve the Cellular Text Telephone Modem specification (for Release 4):

SP-010092	3GPP TS 26.231 version 2.0.0 "Cellular Text Telephone Modem; Minimum Performance Specification" (Release 4)

3. Approve the two specifications for Transparent End-to-end Packet Switched Streaming (for Release 4):

a)	SP-010093	3GPP TS 26.233 version 2.0.0 "Transparent end-to-end packet switched streaming service; General description" (Release 4)
b)	SP-010094	3GPP TS 26.234 version 2.0.0 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs" (Release 4)

4. Approve the Default Codec specification for Packet Switched Conversational Multimedia Applications (for Release 4):

SP-010095	3GPP TS 26.235 version 2.0.0 "Packet Switched Conversational Multimedia Applications; Default Codecs" (Release 4)

5. Approve the In-band Tandem Free Operation (TFO) of Speech Codecs specification (for Release 4):

SP-010096	3GPP TS 28.062 version 2.0.0 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4)

6. Approve the Technical Report on Performance Characterization of the AMR Speech Codec (for Release 1999):

SP-010097	3GPP TR 26.975 version 2.0.0 "Performance Characterisation of the AMR Speech Codec" (Release 1999)

7. Approve the following CRs:

Tdoc SP-010098: TS 02.53/03.53 (Tandem Free Operation (TFO); Service description; Stage 1 / Stage 2)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
02.53	A002		Rel-4	Extension of TFO to AMR	C	8.0.0	S4	TSG-SA WG4#16	S4-010256
03.53	A001	1	Rel-4	Extension of TFO to AMR	C	8.0.0	S4	TSG-SA WG4#16	S4-010290

Tdoc SP-010099: TS 03.50 (Transmission Planning Aspects of the Speech Service in the GSM Public Land Mobile Network (PLMN) System)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
03.50	A029	2	Rel-4	Harmonisation of requirements on terminal acoustics in GSM and 3G	F	8.1.1	S4	TSG-SA WG4#16	S4-010254
03.50	A030	2	Rel-5	Harmonisation of requirements on terminal acoustics in GSM and 3G	F	8.1.1	S4	TSG-SA WG4#16	S4-010255

Tdoc SP-010100: TS 06.73/26.073 (ANSI-C code for the Adaptive Multi Rate speech codec)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
06.73	A023		R98	Correction of potential bug in AMR decoder due to usage of standard C abs() function	F	7.4.1	S4	TSG-SA WG4#16	S4-010214
26.073	003		R99	Correction of potential bug in AMR decoder due to usage of standard C abs() function	A	3.1.0	S4	TSG-SA WG4#16	S4-010198
26.073	004		Rel-4	Correction of potential bug in AMR decoder due to usage of standard C abs() function	A	3.1.0	S4	TSG-SA WG4#16	S4-010199
06.73	A027		R98	Correction of potential bug in AMR decoder due to the usage of standard C abs() function (VAD option_2)	F	7.4.1	S4	TSG-SA WG4#16	S4-010220
26.073	011		R99	Correction of potential bug in AMR decoder due to the usage of standard C abs() function (VAD option_2)	A	3.1.0	S4	TSG-SA WG4#16	S4-010221
26.073	012		Rel-4	Correction of potential bug in AMR decoder due to the usage of standard C abs() function (VAD option_2)	A	3.1.0	S4	TSG-SA WG4#16	S4-010262
06.73	A024		R98	Correction of comfort noise parameter interpolation bug of AMR decoder	F	7.4.1	S4	TSG-SA WG4#16	S4-010215
26.073	005		R99	Correction of comfort noise parameter interpolation bug of AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010200
26.073	006		Rel-4	Correction of comfort noise parameter interpolation bug of AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010201
06.73	A025		R98	Correction of mode state bug in AMR decoder	F	7.4.1	S4	TSG-SA WG4#16	S4-010216
26.073	007		R99	Correction of mode state bug in AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010202
26.073	008		Rel-4	Correction of mode state bug in AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010203
06.73	A026	1	R98	Correction of TX_TYPE and RX_TYPE identifiers	F	7.4.1	S4	TSG-SA WG4#16	S4-010282
26.073	009	1	R99	Correction of TX_TYPE and RX_TYPE identifiers	A	3.1.0	S4	TSG-SA WG4#16	S4-010283

26.073	010	1	Rel-4	Correction of TX_TYPE and RX_TYPE identifiers	A	3.1.0	S4	TSG-SA WG4#16	S4-010284

Tdoc SP-010101: TS 06.74/26.074 (AMR speech Codec; Test sequences)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
06.74	A001		R98	Update of AMR codec test sequences after CRs to TS 06.73	F	7.0.2	S4	TSG-SA WG4#16	S4-010274
26.074	001		R99	Update of AMR codec test sequences after CRs to TS 26.073	A	3.0.2	S4	TSG-SA WG4#16	S4-010275
26.074	002		Rel-4	Update of AMR codec test sequences after CRs to TS 26.073	A	3.0.2	S4	TSG-SA WG4#16	S4-010276

Tdoc SP-010102: TS 06.77 (Minimum Performance Requirements for Noise Suppresser; Application to the AMR Speech Encoder):									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
06.77	A001	4	R99	Addition of test plan and tidying	F	8.0.0	S4	TSG-SA WG4#15	S4-010087 S4-010086
06.77	A002	1	R99	Update of C code for objective measures for NS algorithm characterization	F	8.0.0	S4	TSG-SA WG4#15	S4-010088
06.77	A003	1	R99	Correction of Annex A	F	8.0.0	S4	TSG-SA WG4#15	S4-010089

Tdoc SP-010103: TS 26.102 (AMR speech codec; Interface to Iu)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.102	006	2	R99	Removal of TFO and TrFO from Release 99, and removal of Initial Time Alignment	F	3.2.0	S4	TSG-SA WG4#16	S4-010272
26.102	008	1	Rel-4	Introduction of TFO and TrFO	B	3.2.0	S4	TSG-SA WG4#16	S4-010273

Tdoc SP-010104: TS 26.103 (Speech codec List for GSM and UMTS)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.103	007		Rel-4	Simplification 0f the Optimisation Mode Field	C	4.0.0	S4	TSG-SA WG4#15	S4-010067
26.103	008	2	Rel-4	Introduction of AMR-WB and UMTS_AMR_2	B	4.0.0	S4	TSG-SA WG4#16	S4-010248

Tdoc SP-010105: TS 26.110 (Codec for Circuit Switched Multimedia Telephony Service; General Description)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.110	003	1	R99	Correction of incorrect reference	F	3.0.1	S4	TSG-SA WG4#15	S4-010138
26.110	004	1	Rel-4	Correction of incorrect reference	A	4.0.0	S4	TSG-SA WG4#15	S4-010139
26.110	002	1	Rel-4	Support of mobile multi-link operation in 3G-324M	C	4.0.0	S4	TSG-SA WG4#15	S4-010140

Tdoc SP-010106: TS 26.131 (Terminal Acoustic Characteristics for Telephony; Requirements)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.131	005	1	R99	Harmonisation of narrow-band acoustic requirements between 3GPP and GSM	F	3.1.0	S4	TSG-SA WG4#16	S4-010236
26.131	006	3	Rel-4	Wideband acoustic requirements	B	3.1.0	S4	TSG-SA WG4#16	S4-010271

Tdoc SP-010107: TS 26.132 (Terminal Acoustic Characteristics for Telephony; Test Specification)

Spec	CR	Rev	Phase	Subject	Cat	Ver	WG	Meeting	S4 doc
26.132	002	1	R99	Harmonisation of test methods for acoustics between 3GPP and GSM	F	3.1.0	S4	TSG-SA WG4#16	S4-010237
26.132	003	1	Rel-4	Compatibility with testing wideband telephony transmission performance	B	3.1.0	S4	TSG-SA WG4#16	S4-010156R

Tdoc SP-010108: TS 26.230 (Cellular Text Telephone Modem (CTM); Transmitter C-code description)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.230	001		Rel-4	Bug fix in source code of the CTM receiver	F	4.0.0	S4	TSG-SA WG4#15	S4-010060

Tdoc SP-010109: TS 26.911 (Codec for Circuit switched Multimedia Telephony Service;Terminal Implementor's Guide)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.911	010	1	Rel-4	ITU-T V.80 support for 3G terminals	B	4.0.0	S4	TSG-SA WG4#16	S4-010289

ANNEX A: List of input documents to TSG-SA#11 from S4

Number	Title	Source	Agenda item	Comment
SP-010081	TSG S4 Status Report at TSG-SA#11	SA WG4 Chairman	7.4.1	Information
SP-010082	3GPP TS 26.171 version 2.0.0 "AMR Wideband Speech Codec; General description" (Release 4)	SA WG4	7.4.3	Approval
SP-010083	3GPP TS 26.173 version 2.0.0 "AMR Wideband Speech Codec; C-source code" (Release 4)	SA WG4	7.4.3	Approval
SP-010084	3GPP TS 26.174 version 2.0.0 "AMR-WB speech codec; test sequences" (Release 4)	SA WG4	7.4.3	Approval
SP-010085	3GPP TS 26.190 version 2.0.0 "AMR Wideband Speech Codec; Transcoding Functions" (Release 4)	SA WG4	7.4.3	Approval
SP-010086	3GPP TS 26.191 version 2.0.0 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames" (Release 4)	SA WG4	7.4.3	Approval
SP-010087	3GPP TS 26.192 version 2.0.0 "AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels" (Release 4)	SA WG4	7.4.3	Approval
SP-010088	3GPP TS 26.193 version 2.0.0 "AMR Wideband Speech Codec; Source Controlled Rate operation" (Release 4)	SA WG4	7.4.3	Approval
SP-010089	3GPP TS 26.194 version 2.0.0 "AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels" (Release 4)	SA WG4	7.4.3	Approval
SP-010090	3GPP TS 26.201 version 2.0.0 "AMR Wideband Speech Codec; Speech Codec Frame Structure" (Release 4)	SA WG4	7.4.3	Approval
SP-010091	3GPP TS 26.202 version 2.0.0 "AMR-WB speech codec; interface to Iu and Uu" (Release 4)	SA WG4	7.4.3	Approval
SP-010092	3GPP TS 26.231 version 2.0.0 "Cellular Text Telephone Modem; Minimum Performance Specification" (Release 4)	SA WG4	7.4.3	Approval
SP-010093	3GPP TS 26.233 v. 2.0.0 "Transparent end-to-end packet switched streaming service; General description" (Release 4)	SA WG4	7.4.3	Approval
SP-010094	3GPP TS 26.234 version 2.0.0 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs" (Release 4)	SA WG4	7.4.3	Approval
SP-010095	3GPP TS 26.235 version 2.0.0 "Packet Switched Conversational Multimedia Applications; Default Codecs" (Release 4)	SA WG4	7.4.3	Approval
SP-010096	3GPP TS 28.062 version 2.0.0 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4)	SA WG4	7.4.3	Approval
SP-010097	3GPP TR 26.975 version 2.0.0 "Performance Characterization of the AMR Speech Codec" (Release 1999)	SA WG4	7.4.3	Approval
SP-010098	CRs TS 02.53 and TS 03.53 on Extension of TFO to AMR (Release 4)	SA WG4	7.4.3	Approval
SP-010099	CRs TS 03.50 on Harmonisation of requirements on terminal acoustics in GSM and 3G (Release 4 and Release 5)	SA WG4	7.4.3	Approval
SP-010100	CRs to TS 06.73 and TS 26.073 on Corrections to AMR codec (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010101	CRs to TS 06.74 and TS 26.074 on Update of AMR codec test sequences after CRs to TS 06.73 and TS 26.073 (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010102	CRs to TS 06.77 on Addition of test plan and tidying (R99)	SA WG4	7.4.3	Approval
SP-010103	CRs to TS 26.102 on Introduction of TFO and TrFO (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010104	CRs to TS 26.103 on AMR-WB and TFO (Release 4)	SA WG4	7.4.3	Approval
SP-010105	CRs to TS 26.110 on Corrections and Support of mobile multi-link operation in 3G-324M (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010106	CRs to TS 26.131 on Harmonisation of acoustic requirements between 3GPP and GSM and WB acoustic requirements (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010107	CRs to TS 26.132 on Harmonisation of test methods for acoustics between 3GPP and GSM and Compatibility with testing wideband telephony transmission performance (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010108	CR to Ts 26.230 on Bug fix in source code of the CTM receiver (Release 4)	SA WG4	7.4.3	Approval
SP-010109	CR to TR 26.911 on ITU-T V.80 support for 3G terminals (Release 4)	SA WG4	7.4.3	Approval

Source: TSG-SA WG4 Chairman *TSGS#11 (01)0081 Annex B*

TSG-SA WG4 (Codec Working Group)

Status Report (Tdoc SP-010081)

TSG-SA#11
March 19-22, 2001
Palm Springs, USA

Kari Järvinen
TSG-SA WG4 Chairman
Nokia

3GPP TSG-S4

Content of Presentation

- **1) Review of S4 progress (report in Tdoc SP- 010081)**
  - Input documents, S4 meeting shedule
  - Progress in Work Items:
    - AMR speech codec
    - AMR (AMR-WB) wideband speech codec
    - Tandem Free Operation (TFO)
    - Transparent End-to-End Packet Switched Mobile Streaming Applications
    - Multimedia Codecs and Protocols for Conversational Packet-Switched Services
    - Cellular Text Telephone Modem / Global Text Telephony
    - Maintenance of specifications

- **2) Documents presented for approval**
  - TR on AMR Performance Characterisation
  - AMR-WB speech codec specifications (complete 26-series, speech processing functions)
  - TFO specification
  - Packet Switched Streaming:General Description & Protocols and Codecs specification
  - Conversational Packet Switched Services: Default codecs specification
  - Cellular Text Telephone Modem (CTM) Minimum Performance specification
  - CRs

1) Review of S4 progress

(agenda item 7.4.1)

TSG-S4 Documents

- **Input documents in SP-010081 to SP-010109**

Number	Title	Source	Agenda item	Comment
SP-010081	TSG S4 Status Report at TSG-SA#11	SA WG4 Chairman	7.4.1	Information
SP-010082	3GPP TS 26.171 version 2.0.0 "AMR Wideband Speech Codec; General description" (Release 4)	SA WG4	7.4.3	Approval
SP-010083	3GPP TS 26.173 version 2.0.0 "AMR Wideband Speech Codec; C-source code" (Release 4)	SA WG4	7.4.3	Approval
SP-010084	3GPP TS 26.174 version 2.0.0 "AMR-WB speech codec; test sequences" (Release 4)	SA WG4	7.4.3	Approval
SP-010085	3GPP TS 26.190 version 2.0.0 "AMR Wideband Speech Codec; Transcoding Functions" (Release 4)	SA WG4	7.4.3	Approval
SP-010086	3GPP TS 26.191 version 2.0.0 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames" (Release 4)	SA WG4	7.4.3	Approval
SP-010087	3GPP TS 26.192 version 2.0.0 "AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels" (Release 4)	SA WG4	7.4.3	Approval
SP-010088	3GPP TS 26.193 version 2.0.0 "AMR Wideband Speech Codec; Source Controlled Rate operation" (Release 4)	SA WG4	7.4.3	Approval
SP-010089	3GPP TS 26.194 version 2.0.0 "AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels" (Release 4)	SA WG4	7.4.3	Approval
SP-010090	3GPP TS 26.201 version 2.0.0 "AMR Wideband Speech Codec; Speech Codec Frame Structure" (Release 4)	SA WG4	7.4.3	Approval
SP-010091	3GPP TS 26.202 version 2.0.0 "AMR-WB speech codec; interface to Iu and Uu" (Release 4)	SA WG4	7.4.3	Approval
SP-010092	3GPP TS 26.231 version 2.0.0 "Cellular Text Telephone Modem; Minimum Performance Specification" (Release 4)	SA WG4	7.4.3	Approval
SP-010093	3GPP TS 26.233 v. 2.0.0 "Transparent end-to-end packet switched streaming service; General description" (Release 4)	SA WG4	7.4.3	Approval
SP-010094	3GPP TS 26.234 version 2.0.0 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs" (Release 4)	SA WG4	7.4.3	Approval
SP-010095	3GPP TS 26.235 version 2.0.0 "Packet Switched Conversational Multimedia Applications; Default Codecs" (Release 4)	SA WG4	7.4.3	Approval

TSG-S4 Documents

Input documents (continued)

SP-010096	3GPP TS 28.062 version 2.0.0 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4)	SA WG4	7.4.3	Approval
SP-010097	3GPP TR 26.975 version 2.0.0 "Performance Characterization of the AMR Speech Codec" (Release 1999)	SA WG4	7.4.3	Approval
SP-010098	CRs TS 02.53 and TS 03.53 on Extension of TFO to AMR (Release 4)	SA WG4	7.4.3	Approval
SP-010099	CRs TS 03.50 on Harmonisation of requirements on terminal acoustics in GSM and 3G (Release 4 and Release 5)	SA WG4	7.4.3	Approval
SP-010100	CRs to TS 06.73 and TS 26.073 on Corrections to AMR codec (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010101	CRs to TS 06.74 and TS 26.074 on Update of AMR codec test sequences after CRs to TS 06.73 and TS 26.073 (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010102	CRs to TS 06.77 on Addition of test plan and tidying (R99)	SA WG4	7.4.3	Approval
SP-010103	CRs to TS 26.102 on Introduction of TFO and TrFO (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010104	CRs to TS 26.103 on AMR-WB and TFO (Release 4)	SA WG4	7.4.3	Approval
SP-010105	CRs to TS 26.110 on Corrections and Support of mobile multi-link operation in 3G-324M (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010106	CRs to TS 26.131 on Harmonisation of acoustic requirements between 3GPP and GSM and WB acoustic requirements (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010107	CRs to TS 26.132 on Harmonisation of test methods for acoustics between 3GPP and GSM and Compatibility with testing wideband telephony transmission performance (R99 and Release 4)	SA WG4	7.4.3	Approval
SP-010108	CR to Ts 26.230 on Bug fix in source code of the CTM receiver (Release 4)	SA WG4	7.4.3	Approval
SP-010109	CR to TR 26.911 on ITU-T V.80 support for 3G terminals (Release 4)	SA WG4	7.4.3	Approval

S4 meetings

- **Two S4 plenaries (and one PSM ad hoc) since TSG-SA#10**
  - TSG-S4#15: Jan 22-26 hosted by Siemens in Munich, Germany
  - PSM ad-hoc #1: Feb 8-9 hosted by Ericsson in Lund, Sweden
  - TSG-S4#16: Feb 26 – Mar 2 hosted by ETSI in Sophia Antipolis, France
- **Future meeting schedule**
  - TSG-S4#17: Jun 4-8 to be hosted by Nokia in Naantali, Finland
  - PSM ad-hoc #2: Apr 9-10 to be hosted by Panasonic in Frankfurt, Germany
  - TSG-S4#18: Sep 3-7 to be hosted by Frauenhofer Institut in Erlangen, Germany
  - TSG-S4#19: Dec 3-7 (host open)
- **Meeting statistics**
  - ~ 60-70 participants, 1 week, >150 documents

AMR Speech Codec (R99)

- **The only pending Release 1999 issue is the AMR 3G Performance Characterization Report (TR 26.975)**
  - Listening Tests in 3G channel carried out during October - November, 2000. These complement earlier AMR characterisation results obtained during the GSM AMR codec characterisation phase. Individual test results from laboratories presented for information at TSG-SA#10
  - TR on Performance Characterisation of the AMR Speech Codec (TR 26.975) finalised. This is brought for approval in Tdoc SP-010097.
  - The TR contains information of the AMR codec (results from AMR Verification and Characterisation Phases). The 3G Characterisation test results are contained in Annex E.
  - The results show the performances of subsets of AMR modes under different conditions with combinations of link direction (uplink, downlink), path and speed profiles (vehicular 50 km/h, pedestrian 3 km/h, indoor 3 km/h) and QoS values (FER target values of 0.1%, 0.5% and 3%).
  - The performances typically show no degradation of speech quality for Frame Erasure Rates (FER) under 1%.

Deliverable	Title	Latest version	Comment/Status	Approval requested at
TR 26.975	Performance Characterisation of the AMR Speech Codec	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010097. (Version 1.1.0 based on GSM AMR characterisation results has been presented for information earlier in Tdoc SP-000021 at TSG-SA#6.)	TSG-SA#11

AMR Wideband Speech Codec (Rel-4)

- At TSG-SA#10: codec selection approved, draft versions of 26-series specifications presented for information.
- A full set of AMR-WB codec specifications of 26-series (speech codec speech processing functions) finalised and brought for approval in Tdocs SP-010082 to SP-010091
- These form a full and complete definition of AMR-WB source coding including source controlled rate operation.
- In S4 Packet Switched Multimedia work (TSs 26.234 and 26.235), the AMR-WB codec specifications are already referenced and used in Rel-4.
- Verification Phase has been carried out (codec complexity, codec transmission delay etc.). Some complementing work ongoing.
- Characterisation Phase for 3G and GSM GMSK channels (Phase I) planned for March – June, 2001.
- TR on Characterisation of the AMR-WB Speech Codec expected for approval at TSG-SA#12 (at the earliest).
- Related CRs:
  - Wideband telephony included in Terminal Acoustic Characteristics specifications: Requirements (TS 26.131) and Test Specification (TS 26.132) in Tdocs SP-010106 and SP-010107.
  - AMR-WB codec included in Codec List specification (TS 26.103) in Tdoc SP-010104.

AMR Wideband Speech Codec (Rel-4)

Status of AMR-WB 26-series specifications

Deliverable	Title	Latest version	Comment/Status	Approval requested at
TS 26.171	AMR Wideband Speech Codec; General description	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010082. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010556.	TSG-SA#11
TS 26.173	AMR Wideband Speech Codec; C-source code	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010083. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010557.	TSG-SA#11
TS 26.174	AMR-WB speech codec; test sequences	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010084.	TSG-SA#11
TS 26.190	AMR Wideband Speech Codec; Transcoding Functions	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010085. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010558.	TSG-SA#11
TS 26.191	AMR Wideband Speech Codec; Error concealment of erroneous or lost frames	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010086. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010559.	TSG-SA#11
TS 26.192	AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010087. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010560.	TSG-SA#11
TS 26.193	AMR Wideband Speech Codec; Source Controlled Rate operation	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010088. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010561.	TSG-SA#11
TS 26.194	AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010089. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010562.	TSG-SA#11
TS 26.201	AMR Wideband Speech Codec; Speech Codec Frame Structure	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010090. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010563.	TSG-SA#11
TS 26.202	AMR-WB speech codec; interface to Iu and Uu	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010091. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-010564.	TSG-SA#11
TR 26.xyz	AMR-WB Selection Phase Results	-	To be prepared based on Tdoc SP-000555 "Results of AMR Wideband (AMR-WB) Codec Selection Phase" presented at TSG-SA#10.	TSG-SA#12
TR 26.xyz	Wideband Speech Codec Performances Characterization	-	Characterisation tests planned for 1H01	TSG-SA#12 at the earliest

TFO (Rel-4)

- The AMR Tandem Free Operation (TFO) definition has been finalised. Specification on In-band Tandem Free Operation of Speech Codecs (TS 28.062) is brought for approval at TSG-SA#11 in Tdoc SP-010096.
- TFO avoids the traditional double speech encoding/decoding in MS to MS (GSM), MS to UE (GSM/3G) or UE to UE (3G) call configurations. The key inconvenience of a tandem configuration is the speech quality degradation introduced by the double transcoding.
- When the originating and terminating connections are using the same speech codec, it is possible to transmit transparently the speech frames received from the originating MS to the terminating MS (without activating the transcoding functions in the originating and terminating networks) => TFO.
- The key advantages of TFO are:
  - Improvement in speech quality by avoiding the double transcoding in the network
  - Possible savings on the inter-PLMN transmission links, which are carrying compressed speech compatible with a 16 kbit/s or 8 kbit/s sub-multiplexing scheme, including packet switched transmission
  - Possible savings in processing power in the network equipment since the transcoding functions in the Transcoder Units are bypassed.
  - Possible reduction in the end-to-end transmission delay

TFO (Rel-4)

- TFO protocol provides the following services:
  - Establishment of a transparent path between transcoders
  - Provision of an In-band signalling link between transcoders
  - Exchange of information on the active speech codec type and supported speech codec types at both ends of the call configuration
  - Codec Mismatch Resolution
  - Establishment and Maintenance of Tandem Free Operation when identical codec types are used at both ends of the call configuration
  - Fast and seamless fall back to Tandem Operation in case of necessary or unexpected TFO interruption (i.e. activation of supplementary services)
  - Support for cost efficient transmission
- TFO is activated and controlled by the Transcoder Units. The TFO protocol is fully handled and terminated in the Transcoder Units. For this reason, the Transcoder Units cannot be bypassed in TFO. This is the key difference with Transcoder Free Operation (TrFO)
- The Resolution of a possible Codec Mismatch is defined as an optional feature: find an optimal speech codec (speech codec types and/or configuration) on which TFO may be established.
- Once TFO is established, another optional feature, Codec Optimisation, may be triggered. This determines, if another Common Speech Codec Type/Configuration exists with the potential to provide better speech quality while operating in TFO.

TFO (Rel-4)

- TFO is defined for GSM and 3G codec types: GSM_FR, GSM_HR, GSM_EFR and FR_AMR, HR_AMR, UMTS_AMR, UMTS_AMR_2
- Related CRs:
  - To enable TFO between 3G and GSM, s new codec type (UMTS_AMR_2) is introduced in Codec List (TS 26.103) in CR (Rel-4) in Tdoc SP-010104. This codec type is identical to UMTS_AMR, but the UE shall perform changes of the codec mode to uplink direction only every second frame (every 40 ms as in GSM). UMTS_AMR_2 shall be a mandatory Codec Type from Rel-4 onwards.
  - Updates and corrections (e.g., to include AMR) were made to TFO Stage 1 and 2 descriptions through CRs (Rel-4) in Tdoc SP-010098.

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 28.062	In-band Tandem Free Operation (TFO) of Speech Codecs	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010096. Version 1.0.0 was presented for information at TSG-SA#10 in Tdoc SP-000568.	TSG-SA#11

Transparent End-to-End Packet Switched Mobile Streaming Applications (Rel-4)

- General Description (TS 26.233) and definition of Protocols and Codecs (TS 26.234) have been finalised and are brought for approval in Tdocs SP-010093 and SP-010094.
- As tasked at TSG-SA#10, the S4 work for both specifications has gone through a review process in S2. (The comments from S2 have been incorporated in the specifications.)
- Other updates in the specifications since TSG-SA#10 include agreement of presentation layout (based on SMIL 2.0 Basic Language Profile), file format (MPEG-4 file format) and audio codec (recommendation to use MPEG-4 AAC Low Complexity object type with additional support of MPEG-4 AAC Long Term Prediction object type).
- Rel-4 Packet Switched Streaming contains a complete basic streaming service including:
  - session set-up and control protocols (based on RTSP with SDP as presentation description)
  - data transport protocols (based on RTP over UDP/IP and HTTP over TCP/IP)
  - scene description protocol (SMIL 2.0 Basic Language Profile with three additional modules)
  - interchange format with MMS (MPEG-4 file format)
  - media codecs

Transparent End-to-End Packet Switched Mobile Streaming Applications (Rel-4)

- Default codecs are defined for speech, audio, video, still images, bitmap graphics, and text.
  - *For video coding*, ITU-T H.263 Baseline is the mandatory video codec. Optional codecs are ITU-T H.263 Profile 3 Level 10, and ISO MPEG-4 Visual Simple Profile Level 0.
  - *For speech coding,* the AMR codec is the mandatory codec. AMR-WB is mandatory to be supported when wideband speech (working at 16 kHz sampling frequency) is supported.
  - *For audio*, MPEG-4 AAC Low Complexity object type should be supported. In addition, the MPEG-4 AAC Long Term Prediction object type may be supported.
- Rel-4 is limited to downlink streaming (with a terminal as a streaming client). In Rel-4, there is no explicit capability exchange, interworking with core network services or encryption or digital rights management. These, as well and additional compatible functionality, are planned to be added in a fully backwards compatible manner in later releases of the specifications.
- The content of features to be included Rel-5 will be addressed in Packet Switched Multimedia Ad-Hoc meeting #2 (April 2001) and at the following S4#17 (June 2001).

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 26.233	Packet-switched Streaming Services (PSS); General Description	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010093. Version 1.0.0 was presented for information at TSG-SA#10 in Tdoc SP-000565.	TSG-SA#11
TS 26.234	Packet-switched Streaming Services (PSS); Protocols and Codecs	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010094. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-000566.	TSG-SA#11

Multimedia Codecs and Protocols for Conversational Packet-Switched Services (Rel-4/Rel-5)

- Default Codecs specification (TS 26.235) has been finalised and is brought for approval to TSG-SA#11 in Tdoc SP-010095 (Rel-4).
- Since TSG-SA#10, the main revisions have been in aligning the mandatory codecs to be the same as in Packet Switched Streaming (TS 26.234) and also including real time text conversation feature recommending support for ITU-T T.140.

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 26.235	Packet Switched Conversational Multimedia Applications; Default Codecs	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010095. Version 1.0.0 presented for information at TSG-SA#10 in Tdoc SP-000567.	TSG-SA#11
TR 26.xyz	Performance characterization of default codecs for PS conversational multimedia applications	-	-	TSG-SA#14
TS 26.xyz	Protocols for PS conversational multimedia applications	-	-	TSG-SA#14

Global Text Telephony; Cellular Text Telephone Modem (CTM) (CTM in Rel-4)

- 3 specifications are under the responsibility of S4:
  - Cellular Text Telephone Modem (CTM); General Description (TS 26.226)
  - Transmitter Bit Exact C-code (TS 26.230)
  - Minimum Performance Specification (TS 26.231).
- TS 26.226 and 26.230 were approved at TSG-SA#10.
- The only remaining specification, Minimum Performance Specification (TS 26.231), has been finalised and is brought for approval at TSG-SA#11 in Tdoc SP-010092.
- Some (mostly editorial) updates have been brought to the specification compared to version 1.0.0 presented for information at TSG-SA#10.

Deliverable	Title	Latest Version	Comment/Status	Approval requested at
TS 26.226	GTT Cellular Text Telephone Modem; General Description	2.0.0	Presented for approval at TSG-SA#10 in Tdoc SP-000569.	(Approved at TSG-SA#10)
TS 26.230	GTT Cellular Text Telephone Modem; Transmitter C-code Description	2.0.0	Presented for approval at TSG-SA#10 in Tdoc SP-000570.	(Approved at TSG-SA#10)
TS 26.231	GTT Cellular Text Telephone Modem; Minimum Performance Specification	2.0.0	Presented for approval at TSG-SA#11 in Tdoc SP-010092. Presented for information at TSG-SA#10 in Tdocs SP-000571 and SP-000582.	TSG-SA#11

S4 Progress for Rel-4

- **S4 work meets the targets set for Release 4.**
- **The following specifications are brought for approval to Rel-4:**
  - Full set of 26-series AMR-WB speech codec Technical Specifications: 26.171, 26.173, 26.174, 26.190, 26.191, 26.192, 26.193, 26.194, 26.201, and 26.202
  - TS 28.062 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description"
  - TS 26.233 "Transparent end-to-end packet switched streaming service; General description"
  - TS 26.234 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs"
  - TS 26.235 "Packet Switched Conversational Multimedia Applications; Default Codecs"
  - TS 26.231 "Cellular Text Telephone Modem; Minimum Performance Specification"

2) Documents presented for approval

(agenda item 7.4.3)

Documents for Approval

- **TSG-SA#11 is requested to:**

1. Approve the following AMR-WB codec specifications (for Release 4):

a) SP-010082 TS 26.171 version 2.0.0 "AMR Wideband Speech Codec; General description" (Release 4)

b) SP-010083 TS 26.173 version 2.0.0 "AMR Wideband Speech Codec; C-source code" (Release 4)

c) SP-010084 TS 26.174 version 2.0.0 "AMR-WB speech codec; test sequences" (Release 4)

d) SP-010085 TS 26.190 version 2.0.0 "AMR Wideband Speech Codec; Transcoding Functions" (Release 4)

e) SP-010086 TS 26.191 version 2.0.0 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames" (Release 4)

f) SP-010087 TS 26.192 version 2.0.0 "AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels" (Release 4)

g) SP-010088 TS 26.193 version 2.0.0 "AMR Wideband Speech Codec; Source Controlled Rate operation" (Release 4)

h) SP-010089 TS 26.194 version 2.0.0 "AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels" (Release 4)

i) SP-010090 TS 26.201 version 2.0.0 "AMR Wideband Speech Codec; Speech Codec Frame Structure" (Release 4)

j) SP-010091 TS 26.202 version 2.0.0 "AMR-WB speech codec; interface to Iu and Uu" (Release 4)

Documents for Approval

2. Approve the Cellular Text Telephone Modem specification (for Release 4):

SP-010092 3GPP TS 26.231 version 2.0.0 "Cellular Text Telephone Modem; Minimum Performance Specification" (Release 4)

(This specification describes the minimum performance requirements for CTM for reliable transmission.)

3. Approve the two specifications for Transparent End-to-end Packet Switched Streaming (for Release 4):

a) SP-010093 3GPP TS 26.233 v. 2.0.0 "Transparent end-to-end packet switched streaming service; General description" (Release 4)

(This specification provides general description of the transparent end-to-end packet switched streaming service.)

b) SP-010094 3GPP TS 26.234 version 2.0.0 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs" (Release 4)

(This specification describes the protocols and codecs for the transparent end-to-end packet switched streaming service. Protocols for session set-up, control and data transport are specified. Scene description format and file format are defined. Codecs for speech, audio, video, still images, bitmap graphics, and text are specified.)

Documents for Approval

4. Approve the Default Codecs specification for Packet Switched Conversational Multimedia Applications (for Release 4):

SP-010095 3GPP TS 26.235 version 2.0.0 "Packet Switched Conversational Multimedia Applications; Default Codecs" (Release 4)

(This specification defines the set of default codecs for packet switched conversational multimedia applications within 3GPP IP Multimedia Subsystem.)

5. Approve the In-band Tandem Free Operation (TFO) of Speech Codecs specification (for Release 4):

SP-010096 3GPP TS 28.062 version 2.0.0 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4)

(This specification contains the Service Description for the In-band signalling Protocol for the support of Tandem Free Operation of Speech Codecs in GSM and GSM-evolved 3G systems.)

6. Approve the Technical Report on Performance Characterization of the AMR Speech Codec (for Release 1999):

SP-010097 3GPP TR 26.975 version 2.0.0 "Performance Characterization of the AMR Speech Codec" (Release 1999)

(This technical report provides information of the Adaptive Multi-Rate speech codec.)

Documents for Approval

7. Approve the following CRs:

Tdoc SP-010098: TS 02.53/03.53 (Tandem Free Operation (TFO); Service description; Stage 1 / Stage 2)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
02.53	A002		Rel-4	Extension of TFO to AMR	C	8.0.0	S4	TSG-SA WG4#16	S4-010256
03.53	A001	1	Rel-4	Extension of TFO to AMR	C	8.0.0	S4	TSG-SA WG4#16	S4-010290

Tdoc SP-010099: TS 03.50 (Transmission Planning Aspects of the Speech Service in the GSM Public Land Mobile Network (PLMN) System)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
03.50	A029	2	Rel-4	Harmonisation of requirements on terminal acoustics in GSM and 3G	F	8.1.1	S4	TSG-SA WG4#16	S4-010254
03.50	A030	2	Rel-5	Harmonisation of requirements on terminal acoustics in GSM and 3G	F	8.1.1	S4	TSG-SA WG4#16	S4-010255

Documents for Approval

Tdoc SP-010100: TS 06.73/26.073 (ANSI-C code for the Adaptive Multi Rate speech codec)									
Spec	CR	Rev	Phase	Subject	Cat	Ver	WG	Meeting	S4 doc
06.73	A023		R98	Correction of potential bug in AMR decoder due to usage of standard C abs() function	F	7.4.1	S4	TSG-SA WG4#16	S4-010214
26.073	003		R99	Correction of potential bug in AMR decoder due to usage of standard C abs() function	A	3.1.0	S4	TSG-SA WG4#16	S4-010198
26.073	004		Rel-4	Correction of potential bug in AMR decoder due to usage of standard C abs() function	A	3.1.0	S4	TSG-SA WG4#16	S4-010199
06.73	A027		R98	Correction of potential bug in AMR decoder due to the usage of standard C abs() function (VAD option_2)	F	7.4.1	S4	TSG-SA WG4#16	S4-010220
26.073	011		R99	Correction of potential bug in AMR decoder due to the usage of standard C abs() function (VAD option_2)	A	3.1.0	S4	TSG-SA WG4#16	S4-010221
26.073	012		Rel-4	Correction of potential bug in AMR decoder due to the usage of standard C abs() function (VAD option_2)	A	3.1.0	S4	TSG-SA WG4#16	S4-010262
06.73	A024		R98	Correction of comfort noise parameter interpolation bug of AMR decoder	F	7.4.1	S4	TSG-SA WG4#16	S4-010215
26.073	005		R99	Correction of comfort noise parameter interpolation bug of AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010200
26.073	006		Rel-4	Correction of comfort noise parameter interpolation bug of AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010201
06.73	A025		R98	Correction of mode state bug in AMR decoder	F	7.4.1	S4	TSG-SA WG4#16	S4-010216
26.073	007		R99	Correction of mode state bug in AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010202
26.073	008		Rel-4	Correction of mode state bug in AMR decoder	A	3.1.0	S4	TSG-SA WG4#16	S4-010203
06.73	A026	1	R98	Correction of TX_TYPE and RX_TYPE identifiers	F	7.4.1	S4	TSG-SA WG4#16	S4-010282
26.073	009	1	R99	Correction of TX_TYPE and RX_TYPE identifiers	A	3.1.0	S4	TSG-SA WG4#16	S4-010283
26.073	010	1	Rel-4	Correction of TX_TYPE and RX_TYPE identifiers	A	3.1.0	S4	TSG-SA WG4#16	S4-010284

Documents for Approval

Tdoc SP-010101: TS 06.74/26.074 (AMR speech Codec; Test sequences)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
06.74	A001		R98	Update of AMR codec test sequences after CRs to TS 06.73	F	7.0.2	S4	TSG-SA WG4#16	S4-010274
26.074	001		R99	Update of AMR codec test sequences after CRs to TS 26.073	A	3.0.2	S4	TSG-SA WG4#16	S4-010275
26.074	002		Rel-4	Update of AMR codec test sequences after CRs to TS 26.073	A	3.0.2	S4	TSG-SA WG4#16	S4-010276

Tdoc SP-010102: TS 06.77 (Minimum Performance Requirements for Noise Suppresser; Application to the AMR Speech Encoder):									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
06.77	A001	4	R99	Addition of test plan and tidying	F	8.0.0	S4	TSG-SA WG4#15	S4-010087 S4-010086
06.77	A002	1	R99	Update of C code for objective measures for NS algorithm characterization	F	8.0.0	S4	TSG-SA WG4#15	S4-010088
06.77	A003	1	R99	Correction of Annex A	F	8.0.0	S4	TSG-SA WG4#15	S4-010089

Tdoc SP-010103: TS 26.102 (AMR speech codec; Interface to Iu)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.102	006	2	R99	Removal of TFO and TrFO from Release 99, and removal of Initial Time Alignment	F	3.2.0	S4	TSG-SA WG4#16	S4-010272
26.102	008	1	Rel-4	Introduction of TFO and TrFO	B	3.2.0	S4	TSG-SA WG4#16	S4-010273

Documents for Approval

Tdoc SP-010104: TS 26.103 (Speech codec List for GSM and UMTS)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.103	007		Rel-4	Simplification 0f the Optimisation Mode Field	C	4.0.0	S4	TSG-SA WG4#15	S4-010067
26.103	008	2	Rel-4	Introduction of AMR-WB and UMTS_AMR_2	B	4.0.0	S4	TSG-SA WG4#16	S4-010248

Tdoc SP-010105: TS 26.110 (Codec for Circuit Switched Multimedia Telephony Service; General Description)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.110	003	1	R99	Correction of incorrect reference	F	3.0.1	S4	TSG-SA WG4#15	S4-010138
26.110	004	1	Rel-4	Correction of incorrect reference	A	4.0.0	S4	TSG-SA WG4#15	S4-010139
26.110	002	1	Rel-4	Support of mobile multi-link operation in 3G-324M	C	4.0.0	S4	TSG-SA WG4#15	S4-010140

Tdoc SP-010106: TS 26.131 (Terminal Acoustic Characteristics for Telephony; Requirements)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.131	005	1	R99	Harmonisation of narrow-band acoustic requirements between 3GPP and GSM	F	3.1.0	S4	TSG-SA WG4#16	S4-010236
26.131	006	3	Rel-4	Wideband acoustic requirements	B	3.1.0	S4	TSG-SA WG4#16	S4-010271

Documents for Approval

Tdoc SP-010107: TS 26.132 (Terminal Acoustic Characteristics for Telephony; Test Specification)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.132	002	1	R99	Harmonisation of test methods for acoustics between 3GPP and GSM	F	3.1.0	S4	TSG-SA WG4#16	S4-010237
26.132	003	1	Rel-4	Compatibility with testing wideband telephony transmission performance	B	3.1.0	S4	TSG-SA WG4#16	S4-010156R

Tdoc SP-010108: TS 26.230 (Cellular Text Telephone Modem (CTM); Transmitter C-code description)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.230	001		Rel-4	Bug fix in source code of the CTM receiver	F	4.0.0	S4	TSG-SA WG4#15	S4-010060

Tdoc SP-010109: TS 26.911 (Codec for Circuit switched Multimedia Telephony Service;Terminal Implementor's Guide)									
Spec	**CR**	**Rev**	**Phase**	**Subject**	**Cat**	**Ver**	**WG**	**Meeting**	**S4 doc**
26.911	010	1	Rel-4	ITU-T V.80 support for 3G terminals	B	4.0.0	S4	TSG-SA WG4#16	S4-010289

End of presentation