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"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

An electronic attachment accompanies the present document, containing test sequences for a bit exact implementation of the half rate speech transcoder.

Archive en_300968v080001p0.ZIP which accompanies the present document contains compressed files which are labelled as follows:

Disks24.zip Clause 10: Test sequences for the GSM half rate speech codec; Disks 2 and 4 (GSM 06.07).

Disks135.zip Clause 10: Test sequences for the GSM half rate speech codec; Disks 1, 3 and 5 (GSM 06.07).

Disks6A.zip Clause 10: Test sequences for the GSM half rate speech codec; Disks 6 and 10 (GSM 06.07).

Disks7B.zip Clause 10: Test sequences for the GSM half rate speech codec; Disks 7 and 11 (GSM 06.07).

Disks89.zip Clause 10: Test sequences for the GSM half rate speech codec; Disks 8 and 9 (GSM 06.07).

The present document specifies the half rate speech traffic channels for the Digital cellular telecommunications system.

The present document specifies the digital test sequences for the GSM half rate speech codec for the digital cellular telecommunications system. The present document, is part of a series covering the half rate speech traffic channels as described below:

GSM 06.02 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech processing functions".

GSM 06.06 "Digital cellular telecommunications system (Phase 2+); Half rate speech; ANSI-C code for the GSM half rate speech codec".

GSM 06.07 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Test sequences for the GSM half rate speech codec".

GSM 06.20 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech transcoding".

GSM 06.21 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Substitution and muting of lost frames for half rate speech traffic channels".

GSM 06.22 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Comfort noise aspects for half rate speech traffic channels".

GSM 06.41 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels".

GSM 06.42 "Digital cellular telecommunications system (Phase 2+); Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the digital test sequences for the GSM half rate speech codec. These sequences test for a bit exact implementation of the half rate speech transcoder (GSM 06.20 [2]), Voice Activity Detector (GSM 06.42 [6]), comfort noise (GSM 06.22 [4]) and the discontinuous transmission (GSM 06.41 [5]).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] GSM 06.20: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech transcoding".

[3] GSM 06.21: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Substitution and muting of lost frame for half rate speech traffic channels".

[4] GSM 06.22: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Comfort noise aspects for half rate speech traffic channels".

[5] GSM 06.41: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels".

[6] GSM 06.42: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels".

[7] GSM 06.06: "Digital cellular telecommunications system (Phase 2+); Half rate speech; ANSI-C code for the GSM half rate speech codec".

[8] GSM 06.02: "Digital cellular telecommunications system (Phase 2+); Half rate speech; Half rate speech coding functions".

3 Definitions and abbreviations

3.1 Definitions

Definition of terms used in the present document can be found in GSM 06.20 [2], GSM 06.21 [3], GSM 06.22 [4], GSM 06.41 [5] and GSM 06.42 [6].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ETS	European Telecommunication Standard
GSM	Global System for Mobile communications

For abbreviations not given in this clause, see GSM 01.04 [1].

4 General

Digital test sequences are necessary to test for a bit exact implementation of the half rate speech transcoder (GSM 06.20 [2]), Voice Activity Detector (GSM 06.42 [6]), comfort noise (GSM 06.22 [4]) and the discontinuous transmission (GSM 06.41 [5]).

The test sequences may also be used to verify installations of the ANSI C code in GSM 06.06 [7].

Clause 5 describes the format of the files which contain the digital test sequences. Clause 6 describes the test sequences for the speech transcoder. Clause 7 describes the test sequences for the VAD, comfort noise and discontinuous transmission.

Clause 8 describes the method by which synchronization is obtained between the test sequences and the speech codec under test.

Clause 9 describes the optional acceptance testing of the speech encoder and decoder in the TRAU by means of 8 bit A- or μ-law compressed test sequences on the A-Interface.

Electronic copies of the digital test sequences are provided as clause 10, these digital test sequences are contained in archive en_300968v080001p0.ZIP which accompanies the present document.

5 Test sequence format

This clause provides information on the format of the digital test sequences for the GSM half rate speech transcoder (GSM 06.20 [2]), Voice Activity Detector (GSM 06.42 [6]), comfort noise (GSM 06.22 [4]) and the discontinuous transmission (GSM 06.41 [5]).

5.1 File format

The test sequence files are provided in archive en_300968v080001p0.ZIP which accompanies the present document.

Following decompression, by execution of the 11 "disk*.exe" files, four types of file are provided:

- Files for input to the GSM half rate speech encoder: *.INP
- Files for comparison with the encoder output: *.COD
- Files for input to the GSM half rate speech decoder: *.DEC
- Files for comparison with the decoder output: *.OUT

Tables 1, 2, 3 and 4 define the formats of the four types of file. Each parameter in these tables is contained in a 16 bit word except for the samples of the 8 bit PCM test sequences, which are contained in an 8 bit word each. The left or right justification is indicated in the tables. The size and location of speech parameters in the encoder output (*.COD) and decoder input files (*.DEC) are described in GSM 06.20 [2].

5.2 Codec homing

Each *.INP file includes two homing frames at the start of the test sequence. The function of these frames is to reset the speech encoder state variables to their initial value. In the case of a correct installation of the ANSI-C simulation (GSM 06.06 [7]), all speech encoder output frames shall be identical to the corresponding frame in the *.COD file. In the case of a correct hardware implementation undergoing type approval, the first speech encoder output frame is undefined and need not be identical to the first frame in the *.COD file, but all remaining speech encoder output frames shall be identical to the corresponding frames in the *.COD file.

Each *.DEC file includes two homing frames at the start of the test sequence. The function of these frames is to reset the speech decoder state variables to their initial value. In the case of a correct installation of the ANSI-C simulation (GSM 06.06 [7]), all speech decoder output frames shall be identical to the corresponding frame in the *.OUT file. In the case of a correct hardware implementation undergoing type approval, the first speech decoder output frame is undefined and need not be identical to first frame in the *.OUT file, but all remaining speech decoder output frames shall be identical to the corresponding frames in the *.OUT file.

Table 1: Encoder input sequence (*.INP) format

Name	Description	No. of bits	Justification
s(n)	Encoder input signal	13	Left

Table 2: Encoder output sequence (*.COD) format

Name	Description	No. of words	Justification
Speech	Speech parameters to the channel encoder	18	Right
Additional information			
VAD	Voice activity detection flag	1	Right
SP	SP flag	1	Right

Table 3: Decoder input sequence (*.DEC) format

Name	Description	No. of bits/words	Justification
Speech parameters	Speech parameters to the channel encoder	18 words	Right
BFI flag	Bad Frame Indicator	1 bit / 1 word	Right
UFI flag	Unreliable Frame Indicator	1 bit / 1 word	Right
SID flag	SIlence Descriptor	2 bits / 1 word	Right
TAF flag	Time Alignment Flag	1 bit / 1 word	Right

Table 4: Decoder output sequence (*.OUT) format

Name	Description	No. of bits	Justification
s'(n)	Decoder output signal	13	Left

6 Speech codec test sequences

This clause describes the test sequences designed to exercise the GSM half rate speech transcoder (GSM 06.20 [2]).

6.1 Codec configuration

The speech encoder shall be configured to operate in the non-DTX mode. The VAD and SP flags shall be set to 1 at the speech encoder output.

6.2 Speech codec test sequences

Table 5 lists the location and size of the speech codec test sequences.

6.2.1 Speech encoder test sequences

Three encoder input sequences are provided:

- SEQ01.INP - Sequence for exercising the LPC vector quantization codebooks;
- SEQ02.INP - Sequence for exercising the long term predictor codebooks;
- SEQ03.INP - Sequence for exercising the remaining excitation codebooks.

The SEQ01.INP sequence causes the GSM half rate speech encoder to select every vector in the three reflection coefficient vector quantizers at least once. In a correct implementation, the resulting speech encoder output parameters shall be identical to those specified in the SEQ01.COD sequence.

The SEQ02.INP sequence causes the encoder to select at least once every quantization level in the eight bit table of long term filter lags for the first subframe, and every quantization level in the four bit delta lag quantizer for subframes 2, 3, and 4. In a correct implementation, the resulting speech encoder output parameters shall be identical to those specified in the SEQ02.COD sequence.

The SEQ03.INP sequence causes the encoder to select each of the quantization levels at least once for the remaining GSM half rate speech coder parameters: R0 (frame energy), the soft interpolation decision for the LPC coefficients, the four voicing modes, the gain vectors (GSP0) for each of the voicing modes, and the voiced and unvoiced VSELP codebooks. The only exception to this is that two GSP0 levels in the unvoiced mode are not selected. However, these levels are exercised in the GSM half rate speech decoder as described below. In a correct implementation, the resulting speech encoder output parameters shall be identical to those specified in the SEQ03.COD sequence.

6.2.2 Speech decoder test sequences

Four speech decoder input sequences are provided:

- SEQ01.DEC;
- SEQ02.DEC;
- SEQ03.DEC;
- SEQ04.DEC.

The SEQ01.DEC, SEQ02.DEC, and SEQ03.DEC sequences test the operation of the GSM half rate speech decoder in the absence of channel errors. They are derived from the corresponding SEQXX.INP sequences. In a correct implementation, the resulting speech decoder output shall be identical to the SEQ01.OUT, SEQ02.OUT, and SEQ03.OUT sequences, respectively. Together, these three sequences exercise every quantization level in every codebook in the decoder, with the exception of two GSP0 levels in the unvoiced mode.

The SEQ04.DEC sequence is designed to test the GSM half rate speech decoder under conditions which can result from channel errors. In particular, it is the decoding of LTP lags at the lag table boundaries, given delta lag codes which if incorrectly decoded would point outside the eight bit lag table, that is being tested. Also, the two remaining GSP0 levels in the unvoiced mode are exercised by this sequence. In a correct implementation, the resulting speech decoder output shall be identical to the SEQ04.OUT sequence.

6.2.3 Codec homing sequence

In addition to the test sequences described above, two homing sequences are provided to assist in codec type approval testing. SEQ05.INP contains one encoder-homing-frame. SEQ05.DEC contains one decoder-homing-frame. The use of these sequences is described in GSM 06.02 [8].

Table 5: Location and size of speech codec test sequences

Disk No.	File Name	No. of frames	Size (bytes)
1	SEQ01.INP		754 880
1	SEQ01.COD	2 359	94 360
2	SEQ01.DEC		103 796
2	SEQ01.OUT		754 880
1	SEQ02.INP		249 920
1	SEQ02.COD	781	31 240
2	SEQ02.DEC		34 364
2	SEQ02.OUT		249 920
1	SEQ03.INP		132 160
1	SEQ03.COD	413	16 520
2	SEQ03.DEC		18 172
2	SEQ03.OUT		132 160
2	SEQ04.DEC	76	3 344
2	SEQ04.OUT		24 320
1	SEQ05.INP	1	320
2	SEQ05.DEC		44

7 DTX test sequences

This clause describes the test sequences designed to exercise the VAD algorithm (GSM 06.42 [6]), comfort noise (GSM 06.22 [4]) and discontinuous transmission (GSM 06.41 [5]).

7.1 Codec configuration

The VAD, comfort noise and discontinuous transmission shall be tested in conjunction with the speech encoder [2]). The speech encoder shall be configured to operate in the DTX mode defined in GSM 06.22 [4].

7.2 DTX test sequences

Each DTX test sequence consists of four files:

- Files for input to the GSM half rate speech encoder: *.INP
- Files for comparison with the encoder output *.COD
- Files for input to the GSM half rate speech decoder: *.DEC
- Files for comparison with the decoder output: *.OUT

The *.DEC files are generated from the corresponding *.COD files.

In a correct implementation, the speech encoder parameters generated by the *.INP file shall be identical to those specified in the *.COD file; and the speech decoder output generated by the *.DEC file shall be identical to that specified in the *.OUT file.

Table 6 lists the DTX test sequences and their size in frames.

7.2.1 Predictor values computation

The computation of the predictor values described in GSM 06.42 [6] is not tested explicitly, since the results from the computation are tested many times via the spectral comparison and threshold adaptation tests.

7.2.2 Spectral comparison

The spectral comparison algorithm described in GSM 06.42 [6] is tested by the following test sequence:

- DTX01.*

7.2.3 Threshold adaptation

The threshold adaptation algorithm described in GSM 06.42 [6] is tested by the following test sequence:

- DTX02.*

7.2.4 Periodicity detection

The periodicity detection algorithm described in GSM 06.42 [6] is tested by the following test sequence:

- DTX03.*

7.2.5 Tone detection

The tone detection algorithm described in GSM 06.42 [6] is tested by the following test sequence:

- DTX04.*

7.2.6 Safety and initialization

This sequence checks the safety paths used to prevent zero values being passed to the norm function. It checks the functions described in the adaptive filtering and energy computation, and the prediction values computation given in GSM 06.42 [6]. This sequence also checks the initialization of thvad and the rvad array:

- DTX05.*

7.2.7 Comfort noise test sequence

The test sequences described in sub-clauses 7.2.2 to 7.2.6 are designed to exercise the VAD described in GSM 06.42 [6] and the discontinuous transmission described in GSM 06.41 [5]. The following test sequence is defined to exercise the comfort noise algorithm described in GSM 06.22 [4]:

- DTX06.*

7.2.8 Real speech and tones

The test sequences cannot be guaranteed to find every possible error. There is therefore a small possibility that an incorrect implementation produces the correct output for the test sequences, but fails with real signals. Consequently, an extra sequence is included, which consists of very clean speech, barely detectable speech and a swept frequency tone:

- DTX07.*

NOTE: Some of the DTX test sequences contain homing frames. The DTX test sequences are therefore only suitable for testing a single transcoding.

Table 6: Location and size of DTX test sequences

Disk No.	File Name	No. of Frames	size (bytes) *.INP	*.COD	*.DEC	*.OUT
3	DTX01	460	147 200	18 400	20 240	147 200
3	DTX02	886	283 520	35 440	38 984	283 520
3	DTX03	125	40 000	5 000	5 500	40 000
3	DTX04	317	101 440	12 680	13 948	101 440
3	DTX05	37	11 840	1 480	1 628	11 840
4	DTX06	240	76 800	9 600	10 560	76 800
4	DTX07	1 188	380 160	47 520	52 272	380 160

8 Sequences for finding the 20 ms framing of the GSM half rate speech encoder

When testing the decoder, alignment of the test sequences used to the decoder framing is achieved by the air interface (testing of MS) or can be reached easily on the A_{bis}-interface (testing on network side).

When testing the encoder, usually there is no information available about where the encoder starts its 20 ms segments of speech input to the encoder.

In the following, a procedure is described to find the 20 ms framing of the encoder using special synchronization sequences. This procedure can be used for MS as well as for network side.

Synchronization can be achieved in two steps. First, bit synchronization has to be found. In a second step, frame synchronization can be determined. This procedure takes advantage of the codec homing feature of the half rate codec, which puts the codec in a defined home state after the reception of the first homing frame. On the reception of further homing frames, the output of the codec is predefined and can be triggered to.

8.1 Bit synchronization

The input to the speech encoder is a series of 13 bit long words (104 kbits/s, 13 bit linear PCM). When starting to test the speech encoder, no knowledge is available on bit synchronization, i.e. where the encoder expects its least significant bits, and where it expects the most significant bits.

The encoder homing frame consists of 160 samples, all set to zero with the exception of the least significant bit, which is set to one (0 0000 0000 0001 binary, or 0x0008 hex if written into 16 bit words left justified). If two such encoder homing frames are input to the encoder consecutively, the decoder homing frame is expected at the output as a reaction of the second encoder homing frame.

Since there are only 13 possibilities for bit synchronization, after a maximum of 13 trials bit synchronization can be reached. In each trial, three consecutive encoder homing frames are input to the encoder. If the decoder homing frame is not detected at the output, the relative bit position of the three input frames is shifted by one and another trial is performed. As soon as the decoder homing frame is detected at the output, bit synchronization is found, and the first step can be terminated.

The reason why three consecutive encoder homing frames are needed is that frame synchronization is not known at this stage. To be sure that the encoder reads two complete homing frames, three frames have to be input. Wherever the encoder has its 20 ms segmentation, it will always read at least two complete encoder homing frames.

An example of the 13 different frame triplets is given in sequence BITSYNC.INP (see table 7).

8.2 Frame synchronization

Once bit synchronization is found, frame synchronization can be found by inputting one special frame that delivers 160 different output frames, depending on the 160 different positions that this frame can possibly have with respect to the encoder framing.

This special synchronization frame was found by taking one input frame and shifting it through the positions 0 to 159. The corresponding 160 encoded speech frames were calculated and it was verified that all 160 output frames were different. When shifting the input synchronization frame, the samples at the beginning were set to 0x0008 hex, which corresponds to the samples of the encoder homing frame.

Before inputting this special synchronization frame to the encoder, again the encoder has to be reset by one encoder homing frame. A second encoder homing frame is needed to provoke a decoder homing frame at the output that can be triggered to. And since the framing of the encoder is not known at that stage, three encoder homing frames have to precede the special synchronization frame to ensure that the encoder reads at least two homing frames, and at least one decoder homing frame is produced at the output, serving as a trigger for recording.

The special synchronization frame preceded by the three encoder homing frames are given in SEQSYNC.INP. The corresponding 160 different output frames are given in SYNC000.COD through SYNC159.COD. The three digit number in the filename indicates the number of samples by which the input was retarded with respect to the encoder framing. By a corresponding shift in the opposite direction, alignment with the encoder framing can be reached.

8.3 Formats and sizes of the synchronization sequences

BIT SYNC.INP:

This sequence consists of 13 frame triplets. It has the format of the speech encoder input test sequences (13 bit left justified with the three least significant bits set to zero).

The size of it is therefore:

SIZE (BITSYNC.INP) = 13 * 3 * 160 * 2 bytes = 12480 bytes.

SEQSYNC.INP:

This sequence consists of 3 encoder reset frames and the special synchronization frame. It has the format of the speech encoder input test sequences (13 bit left justified with the three least significant bits set to zero).

The size of it is therefore:

SIZE (SEQSYNC.INP) = 4 * 160 * 2 bytes = 1280 bytes.

SYNCXXX.COD:

These sequences consists of 1 encoder output frame each. They have the format of the speech encoder output test sequences (16 bit words right justified). The values of the VAD and SP flags are set to one in these files.

The size of them is therefore:

SIZE (SYNCXXX.COD) = (18 + 2) * 2 bytes = 40 bytes

Table 7 summarizes this information.

Table 7: Location, size and justification of synchronization sequences

Disk No.	Purpose of Sequence	Name of Sequence	No. of Frames	Size in Bytes	Justification
5	Bit Synchronization	BITSYNC.INP	39	1 2480	Left
5	Frame Synchronization (input)	SEQSYNC.INP	4	1 280	Left
5	Frame Synchronization (output)	SYNC000.COD SYNC001.COD SYNC002.COD " " " SYNC159.COD	1 1 1 " " " 1	40 40 40 " " " 40	Right Right Right " " " Right

9 Trau Testing with 8 Bit A- and µ-law PCM Test Sequences

In the previous clauses tests for the transcoder in the TRAU are described using 13 bit linear test sequences. However, these 13 bit test sequences require a special interface in the Trau and do not allow testing in the field. In most cases the TRAU has to be set in special mode before testing.

As an option, the speech codec tests can be performed with A/µ law compressed 8 bit PCM test sequences on the A interface. These modified input test sequences (*-X.INP) are generated from the original sequences by A or µ law compression. As an input to the encoder they result in modified encoder output sequences (*-X.COD). The same *.dec decoder input sequences as in clause 6.2.2. are then used to produce the output sequences *-X.OUT, which are A- or µ-law compressed.

The A- and µ-law compression and decompression does not change the homing frames at the encoder input. The format of all A- and µ-law PCM files *-X.INP and *-X.OUT is one sample (8 bit) per byte. The format of all other files is as described in clause 5.

All files are provided in archive en_300968v080001p0.ZIP which accompanies the present document. The 'X' in the tables below with the filenames stands for A (A-law) and U (µ-law), respectively. The decoder input files *.dec are the same as in Table 5 and are not described in this clause.

Table 8: Location and size of compressed 8 bit PCM speech codec test sequences

Disk No.	File Name	No. of frames	Size (bytes)
6/7 6/7 6/7	SEQ01-X.INP SEQ01-X.COD SEQ01-X.OUT	2 359	377 440 94 360 377 440
6/7 6/7 6/7	SEQ02-X.INP SEQ02-X.COD SEQ02-X.OUT	781	124 960 31 240 124 960
6/7 6/7 6/7	SEQ03-X.INP SEQ03-X.COD SEQ03-X.OUT	413	66 080 16 520 66 080
6/7	SEQ04-X.OUT	76	12 160
6/7	SEQ05-X.INP	1	160

Table 9: Location and size of compressed 8 bit PCM DTX test sequences

			size	(bytes)	
Disk No.	**File Name**	**No. of Frames**	***.INP**	***.COD**	***.OUT**
8/9	DTX01-X	460	73 600	18 400	73 600
8/9	DTX02-X	886	141 760	35 440	141 760
8/9	DTX03-X	125	20 000	5 000	20 000
8/9	DTX04-X	317	50 720	12 680	50 720
8/9	DTX05-X	37	5 920	1 480	5 920
8/9	DTX06-X	240	38 400	9 600	38 400
8/9	DTX07-X	1 188	190 080	47 520	190 080

In addition to the testsequences above, special input (seqsyncX.inp) and output (syncxxxX.cod) sequences for frame synchronization are provided. The X again stands for A and µ law compressed PCM. The synchronization procedure is described in clause 8.

Table 10: Location, size and justification of compressed8 bit PCM test sequences

Disk No.	Purpose of Sequence	Name of Sequence	No. of Frames	Size in Bytes	Justification
10/11	Frame Synchronization (input)	SEQSYNCX.INP	4	640	-
10/11	Frame Synchronization (output)	SYNC000X.COD SYNC001X.COD SYNC002X.COD " " " SYNC159X.COD	1 1 1 " " " 1	40 40 40 " " " 40	Right Right Right " " " Right

10 Test sequences for the GSM half rate speech codec

NOTE: This clause is contained in archive en_300968v080001p0.ZIP which accompanies the present document.

Annex A (informative): Change history

Change history					
SMG No.	**TDoc. No.**	**CR. No.**	**Section affected**	**New version**	**Subject/Comments**
SMG#16				4.0.3	ETSI Publication
SMG#20				5.0.1	Release 1996 version
SMG#23	97-737	A003		5.1.1	UAP60 and Supplementary notes on 06.06 Call Graph Changes
SMG#27				6.0.0	Release 1997 version
SMG#28				6.0.1	ETSI Publication
SMG#29				7.0.0	Release 1998 version
				7.0.1	Version update to 7.0.1 for Publication
SMG#31				8.0.0	Release 1999 version
				8.0.1	Update to Version 8.0.1 for Publication

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
03-2001	11				Version for Release 4		4.0.0
06-2002	16				Version for Release 5	4.0.0	5.0.0
12-2004	26				Version for Release 6	5.0.0	6.0.0
06-2007	36				Version for Release 7	6.0.0	7.0.0
12-2008	42				Version for Release 8	7.0.0	8.0.0
12-2009	46				Version for Release 9	8.0.0	9.0.0
03-2011	51				Version for Release 10	9.0.0	10.0.0
09-2012	57				Version for Release 11	10.0.0	11.0.0
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