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G.997.1
Amendment 2
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SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Digital sections and digital line system – Access networks

Physical layer management for digital subscriber line (DSL) transceivers
Amendment 2

ITU-T Recommendation G.997.1 (2003) – Amendment 2

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Physical layer management for digital subscriber line (DSL) transceivers

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Summary

This amendment to ITU-T Rec. G.997.1 (05/2003) contains:

–   Extension of INP values;

–   Modification of MSGMIN bounds;

–   Addition of an upstream PSD mask parameter;

–   Use of one-second normalized CRC anomaly counter increment for SES declaration.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Physical layer management for digital subscriber line (DSL) transceivers

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1)   Addition of new INP values

Modify 7.3.2.3 as follows:

7.3.2.3   Minimum Impulse Noise Protection

This parameter specifies the minimum impulse noise protection for the bearer channel. The impulse noise protection is expressed in symbols and can take the values 0, ½, 1, ~~or~~ 2, 4, 8 and 16 symbols.

2)   Modification of MSGMIN bounds

Modify clauses 7.3.1.5.1 and 7.3.1.5.2 as follows:

7.3.1.5.1 Minimum Overhead Rate Upstream (MSGMINus)

This parameter defines the minimum rate of the message based overhead that shall be maintained by the ATU in upstream direction. MSGMINus is expressed in bits per second and ranges from 4000 to ~~64000~~ 63 000 bit/s.

7.3.1.5.2 Minimum Overhead Rate Downstream (MSGMINds)

This parameter defines the minimum rate of the message based overhead that shall be maintained by the ATU in downstream direction. MSGMINds is expressed in bits per second and ranges from 4000 to ~~64000~~ 63 000 bit/s.

3)   New parameter for upstream PSD Mask

i)   *Add the following new clause 7.3.1.2.11:*

7.3.1.2.11 Upstream PSD Mask (PSDMASKus)

This configuration parameter defines the upstream PSD mask applicable at the U-R2 reference point. This MIB PSD mask may impose PSD restrictions in addition to the Limit PSD mask defined in the relevant Recommendations (e.g., ITU-T Rec. G.992.3).

The upstream PSD mask in the CO-MIB shall be specified through a set of breakpoints. Each breakpoint shall consist of a subcarrier index t and a MIB PSD mask level (expressed in dBm/Hz) at that subcarrier. The set of breakpoints can then be represented as $[(t_1, PSD_1), (t_2, PSD_2), \ldots , (t_N, PSD_N)]$. The subcarrier index shall be coded as an unsigned integer. The MIB PSD mask level shall be coded as an unsigned integer representing the MIB PSD mask levels 0 dBm/Hz (coded as 0) to −95 dBm/Hz (coded as 255), in steps of 0.5 dBm/Hz. The maximum number of breakpoints is 4.

The requirements for a valid set of breakpoints are defined in the relevant Recommendations (e.g., ITU-T Rec. G.992.3).

ii)   *Add a line in Table 7-9 after the* RFIBANDS downstream *as follows:*

Category/Element	Defined in:	Q Interface	U-C Interface	U-R Interface	T/S Interface
PSDMASK upstream	7.3.1.2.11	R/W (M)	R (O)		

iii)   *Add a line in Table 7-10 after the* RFIBANDS downstream *as follows:*

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5
PSDMASK upstream			Y (Annexes J/M)		Y (Annexes J/M)

4)   Use of one-second normalized CRC anomaly counter increment for SES declaration

i)   *Modify clauses 7.2.1.1.3 and 7.2.1.2.3 as follows:*

7.2.1.1.3 Severely errored second – line (SES-L)

This parameter is a count of <u>severely errored second (SES). A SES is declared if</u> ~~1-second intervals with~~ 18 or more CRC-8 anomalies summed over all received bearer channels, or one or more LOS defects, or one or more SEF defects, or one or more LPR defects<u>, occur during a 1-second interval</u>.

<u>If the relevant Recommendation (e.g., ITU-T Rec. G.992.3) supports one-second normalized CRC anomaly counter increment, the one-second counter used to declare SES shall increment with this value instead of one for each CRC-8 anomaly.</u>

If a common CRC is applied over multiple bearer channels, then each related CRC-8 anomaly shall be counted only once for the whole set of bearer channels over which the CRC is applied.

7.2.1.2.3 Severely Errored Second – Line far-end (SES-LFE)

This parameter is a count of <u>severely errored second (SES). A SES is declared if</u> ~~1-second intervals with~~ 18 or more FEBE anomalies summed over all transmitted bearer channels, or one or more far-end LOS defects, or one or more RDI defects, or one or more LPR-FE defects<u>, occur during a 1 second-interval</u>.

<u>If the relevant Recommendation (e.g., ITU-T Rec. G.992.3) supports one-second normalized CRC anomaly counter increment, the one-second counter used to declare SES shall increment with this value instead of one for each FEBE anomaly.</u>

If a CRC is applied over multiple bearer channels, then each related FEBE anomaly shall be counted only once for the whole set of related bearer channels.

ii)   *Add a new Note 4 in Table 7-1 as follows:*

Table 7-1/G.997.1 – Line performance monitoring parameter definitions

Name	Text subclause	End	Use at ATU-C	Use at ATU-R	Definition
FECS-L		Near	M	M	FEC ≥ 1 for one or more bearer channels
FECS-LFE		Far	M	O	FFEC ≥ 1 for one or more bearer channels
ES-L		Near	M	M	CRC-8 ≥ 1 for one or more bearer channels **OR** LOS ≥ 1 **OR** SEF ≥ 1 **OR** LPR ≥ 1

Table 7-1/G.997.1 – Line performance monitoring parameter definitions

Name	Text subclause	End	Use at ATU-C	Use at ATU-R	Definition
ES-LFE		Far	M	O	FEBE ≥ 1 for one or more bearer channels **OR** LOS-FE ≥ 1 **OR** RDI ≥ 1 **OR** LPR-FE ≥ 1
SES-L		Near	M	M	(CRC-8 summed over all bearer channels) ≥ 18 **OR** LOS ≥ 1 **OR** SEF ≥ 1 **OR** LPR ≥ 1
SES-LFE		Far	M	O	(FEBE summed over all bearer channels) ≥ 18 **OR** LOS-FE ≥ 1 **OR** RDI ≥ 1 **OR** LPR-FE ≥ 1
LOSS-L		Near	O	O	LOS ≥ 1
LOSS-LFE		Far	O	O	LOS-FE ≥ 1
UAS-L		Near	M	M	A second of unavailability
UAS-LFE		Far	M	O	A second of unavailability

NOTE 1 – Note that **OR** represents a logical OR of two conditions.

NOTE 2 – Unavailability begins at the onset of 10 contiguous severely errored seconds, and ends at the onset of 10 contiguous seconds with no severely errored seconds.

NOTE 3 – If a common CRC or FEC is applied over multiple bearer channels, then each related CRC-8 or FEC anomaly shall be counted only once for the whole set of bearer channels over which the CRC or FEC is applied.

NOTE 4 – If the relevant Recommendation supports one-second normalized CRC counter increments, these increments shall be used instead of an increment of one for each CRC-8 and FEBE anomaly to declare SES.

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