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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 (2006) –
Amendment 2

ITU-T G-SERIES RECOMMENDATIONS

TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation G.997.1

Physical layer management for digital subscriber line (DSL) transceivers

Amendment 2

Summary

Amendment 2 to ITU-T Recommendation G.997.1 Revision 3 contains:

−   Support for INPMIN and ACTINP to ITU-T Recommendation G.992.1.

−   Additional line configuration parameters for Equalized FEXT UPBO to ITU-T Recommendation G.993.2.

−   Additional parameters for the support of an impulse noise monitor to ITU-T Recommendation G.993.2

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ITU-T Recommendation G.997.1

Physical layer management for digital subscriber line (DSL) transceivers

Amendment 2

1)   Addition of optional support of INPMIN and ACTINP for G.992.1

a)   Modify clause 7.3.2.3 as follows:

7.3.2.3   Minimum impulse noise protection (INPMIN)

This parameter specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 4.3125 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 4.3125 kHz and can take the values ½ and any integer from 0 to 16, inclusive.

If the xTU does not support the configured INPMIN value, it shall use the nearest supported impulse noise protection greater than INPMIN.

7.3.2.3.1   Special requirements for ITU-T Rec. G.992.1

It is optional to apply the INPMIN parameter in the case of ITU-T Rec. G.992.1. If INPMIN is supported, the ATU-C shall offer to the ATU-R a range of combinations of framing parameters (C-RATES-1 and C-RATES-RA options) during initialization, which provide an ACTINP value equal to or greater than the INPMIN value specified over the Q interface. The ACTINP value for ITU-T Rec. G.992.1 is defined in clause 7.5.2.4.

b)   Modify clause 7.5.2.4 as follows:

7.5.2.4   Actual impulse noise protection (ACTINP)

This parameter reports the actual impulse noise protection (INP) on the bearer channel in the L0 state. In the L1 or L2 state, the parameter contains the INP in the previous L0 state. For ADSL2, this value is computed according to the formula specified in the relevant Recommendation based on the actual framing parameters. For ITU-T Rec. G.993.2, the method to report this value is according to the INPREPORT parameter. The value is coded in fractions of DMT symbols with a granularity of 0.1 symbols. The range is from 0 to 25.4. A special value indicates an ACTINP higher than 25.4.

7.5.2.4.1   Special requirements for ITU-T Rec. G.992.1

For ITU-T Rec. G.992.1, the reporting of ACTINP is optional. If reported, the ACTINP value of a bearer mapped in the interleaved path shall be computed by the formula:

$$ACTINP = \left(\frac{1}{2}\right) \times (S \times D) \times \left(\frac{R_I}{N_I}\right)$$

where S, D, R_I and N_I are defined in ITU-T Rec. G.992.1. The ACTINP value of a bearer mapped in the fast path shall be 0.

c)   *Modify Tables 7-16 and 7-17 as follows:*

Table 7-16/G.997.1 – Channel configuration profile

Category/Element	Defined in:	Q- Interface	U-C Interface	U-R Interface	T-/S- Interface
Data Rate					
Minimum Data Rate	7.3.2.1.1	R/W (M)	R (O)		
Minimum Reserved Data Rate	7.3.2.1.2	R/W (O)	R (O)		
Maximum Data Rate	7.3.2.1.3	R/W (M)	R (O)		
Rate Adaptation Ratio	7.3.2.1.4	R/W (O)	R (O)		
Minimum Data Rate in low power state	7.3.2.1.5	R/W (M)	R (O)		
Maximum Interleaving Delay	7.3.2.2	R/W (M)	R (O)		
Minimum Impulse Noise Protection (INPMIN)	7.3.2.3	R/W (M/O) (Note)	R (O)		
Minimum Impulse Noise Protection 8 kHz (INPMIN8)	7.3.2.4	R/W (M)	R (O)		
FORCEINP	7.3.2.5	R/W (M)			
Maximum Bit Error Ratio	7.3.2.6	R/W (M)	R (O)		
Data Rate Threshold Upshift	7.3.2.8.1	R/W (M)			
Data Rate Threshold Downshift	7.3.2.8.2	R/W (M)			
Maximum Delay Variation (DVMAX)	7.3.2.9	R/W (O)			
Channel Initialization Policy selection (CIPOLICY)	7.3.2.10	R/W (O)			
Near-end (xTU-C) Performance Monitoring Thresholds (15-minute interval)					
CV-C threshold 15 minutes	7.3.2.7	R/W (O)	R (O)		
FEC-C threshold 15 minutes	7.3.2.7	R/W (O)	R (O)		
Near-end (xTU-C) Performance Monitoring Thresholds (24-hour interval)					
CV-C threshold 24 hours	7.3.2.7	R/W (O)	R (O)		
FEC-C threshold 24 hours	7.3.2.7	R/W (O)	R (O)		
Far-end (xTU-R) Performance Monitoring Thresholds (15-minute interval)					
CV-CFE threshold 15 minutes	7.3.2.7	R/W (O)	R (O)		
FEC-CFE threshold 15 minutes	7.3.2.7	R/W (O)	R (O)		
Far-end (xTU-R) Performance Monitoring Thresholds (24-hour interval)					
CV-CFE threshold 24 hours	7.3.2.7	R/W (O)	R (O)		
FEC-CFE threshold 24 hours	7.3.2.7	R/W (O)	R (O)		
NOTE – This parameter is R/W (O) on the Q-interface for G.992.1 and R/W (M) for all other ITU-T Recommendations that support it.					

Table 7-17/G.997.1 – Support of Channel configuration parameters per Recommendation

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5	G.993.2
Data Rate						
Minimum Data Rate	Y	Y	Y	Y	Y	Y
Minimum Reserved Data Rate		Y	Y	Y	Y	Y
Maximum Data Rate	Y	Y	Y	Y	Y	Y
Rate Adaptation Ratio	Y	Y	Y	Y	Y	Y
Minimum Data Rate in low power state		Y	Y	Y	Y	
Maximum Interleaving Delay	Y	Y	Y	Y	Y	Y
Minimum Impulse Noise Protection (INPMIN)	<u>Y</u>		Y	Y	Y	Y
Minimum Impulse Noise Protection 8 kHz (INPMIN8)						Y
FORCEINP						Y
Maximum Bit Error Ratio			Y	Y	Y	
Data Rate Threshold Upshift	Y	Y	Y	Y	Y	
Data Rate Threshold Downshift	Y	Y	Y	Y	Y	
Maximum Delay Variation (DVMAX)						Y
Channel Initialization Policy selection (CIPOLICY)			Y		Y	Y
Near-end Performance Monitoring Thresholds (15-minute interval)						
CV-C threshold 15 minutes	Y	Y	Y	Y	Y	Y
FEC-C threshold 15 minutes	Y	Y	Y	Y	Y	Y
Near-end Performance Monitoring Thresholds (24-hour interval)						
CV-C threshold 24 hours	Y	Y	Y	Y	Y	Y
FEC-C threshold 24 hours	Y	Y	Y	Y	Y	Y
Far-end Performance Monitoring Thresholds (15-minute interval)						
CV-CFE threshold 15 minutes	Y	Y	Y	Y	Y	Y

Table 7-17/G.997.1 – Support of Channel configuration parameters per Recommendation

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5	G.993.2
FEC-CFE threshold 15 minutes	Y	Y	Y	Y	Y	Y
Far-end Performance Monitoring Thresholds (24-hour interval)						
CV-CFE threshold 24 hours	Y	Y	Y	Y	Y	Y
FEC-CFE threshold 24 hours	Y	Y	Y	Y	Y	Y

d)   Modify Tables 7-30 and 7-31 as follows:

Table 7-30/G.997.1 – Channel test, diagnostic and status parameters

Category/Element	Defined in:	Q- Interface	U-C Interface	U-R Interface	T-/S- Interface	G Interface
Actual Data Rate	7.5.2.1	R (M)			R (O)	R (O)
Previous Data Rate	7.5.2.2	R (M)			R (O)	R (O)
Actual Interleaving Delay	7.5.2.3	R (M)		R (O)	R (O)	R (O)
ACTINP	7.5.2.4	R (M/O) (Note 2)		R (O)	R (O)	R (O)
INPREPORT	7.5.2.5	R (M)		R(O)	R(O)	R(O)
Actual Framer Setting						
NFEC	7.5.2.6.1	R (M/O) (Note 1)		R (O)		R (O)
RFEC	7.5.2.6.2	R (M/O) (Note 1)		R (O)		R (O)
LSYMB	7.5.2.6.3	R (M/O) (Note 1)		R (O)		R (O)
INTLVDEPTH	7.5.2.6.4	R (M/O) (Note 1)		R (O)		R (O)
INTLVBLOCK	7.5.2.6.5	R (M)		R (O)		R (O)
Actual Latency Path						
LPATH	7.5.2.7	R (M/O) (Note 1)		R (O)		R (O)
NOTE 1 – These parameters are R(M) on the Q-interface for G.993.2 and R(O) for all other ITU-T Recommendations, which support them.						
NOTE 2 – This parameter is R(O) on the Q-interface for G.992.1 and R(M) for all other ITU-T Recommendations that support it.						

Table 7-31/G.997.1 – Support of Channel test, diagnostic and status parameters per Recommendation

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5	G.993.2
Actual Data Rate	Y	Y	Y	Y	Y	Y
Previous Data Rate	Y	Y	Y	Y	Y	Y
Actual Interleaving Delay	Y	Y	Y	Y	Y	Y
ACTINP	<u>Y</u>		Y	Y	Y	Y
INPREPORT						Y
Actual Framer Setting						
NFEC	Y	Y	Y	Y	Y	Y
RFEC	Y	Y	Y	Y	Y	Y
LSYMB	Y	Y	Y	Y	Y	Y
INTLVDEPTH	Y	Y	Y	Y	Y	Y
INTLVBLOCK						Y
Actual Latency Path						
LPATH	Y	Y	Y	Y	Y	Y

2)   Equalized-FEXT UPBO

a)   Modify clause 7.3.1.2.14 as follows:

7.3.1.2.14 Upstream Power Back Off -Shaped (UPBOSHAPED)

Upstream power back-off (UPBO) is specified in ITU-T Rec. G.993.2 to provide spectral compatibility between loops of different lengths deployed in the same binder. The upstream transmit PSD mask, UPBOMASKus is defined in 7.2.1.3.2/G.993.2. ~~using the formula:~~

$$UPBOMASK(kl_{0},f) = UPBOPSD(f) + LOSS(kl_{0},f) + 3.5 \qquad \text{[dBm/Hz]}$$

$$LOSS(kl_{0},f) = kl_{0}\sqrt{f} \quad \text{[dB]}$$

~~where *UPBOPSD(f) =   a-b√f.*~~

The <u>G.993.2</u> UPBO configuration parameters a ~~and,~~ b <u>and the reference electrical lengths $kl_{0\ REF}$</u> shall be set by the NMS in the CO-MIB. The parameter kl_{0} may be determined during initialization by the VTUs or forced by the CO-MIB.

a)   Upstream power back-off configuration parameters

a.1)   Upstream power back-off reference PSD per band (UPBOPSD-pb)

This parameter defines the UPBO reference PSD used to compute the upstream power back-off for each upstream band except US0. A UPBOPSD defined for each band shall consist of two parameters [a, b]. Parameter a ranges from 40 dBm/Hz to 80.95 dBm/Hz in steps of 0.01 dBm/Hz; and parameter b ranges from 0 to 40.95 dBm/Hz in steps of 0.01 dBm/Hz. The UPBO reference PSD at the frequency f expressed in MHz shall be equal to $-a - b\sqrt{f}$. The set of parameter values $a = 40$ dBm/Hz, $b = 0$ dBm/Hz is a special configuration to disable UPBO in the respective upstream band.

a.2)   Upstream electrical length (UPBOKL)

This parameter defines the electrical length expressed in dB at 1 MHz, kl_{0}, configured by the CO-MIB. The value ranges from 0 to 128 dB in steps of 0.1 dB.

a.3)   *Force CO-MIB electrical length (UPBOKLF)*

This parameter is a flag that forces the VTU-R to use the electrical length of the CO-MIB (UPBOKL) to compute the UPBO. The value shall be forced if the flag is set to 1. Otherwise, the VTUs shall determine the electrical length.

a.4)   *UPBO reference electrical length per band (UPBOKLREF-pb)*

This parameter defines the UPBO reference electrical length used to compute the upstream power back-off for each upstream band except US0, for the optional Equalized FEXT UPBO method. The value ranges from 1.8 to 63.5 dB in steps of 0.1 dB with special value 0. The use of the special value 0 is described in 7.2.1.3.2/G.993.2.

b)   *Add and modify rows in the Power and Spectrum Usage section of Tables 7-14 and 7-15 as follows:*

Table 7-14/G.997.1 – Line configuration profile

Category/Element	Defined in:	Q-Interface	U-C Interface	U-R Interface	T-/S-Interface
Power and Spectrum Usage					
MAXNOMPSD downstream	7.3.1.2.1	R/W (M)	R (O)		
MAXNOMPSD upstream	7.3.1.2.2	R/W (M)	R (O)		
MAXNOMATP downstream	7.3.1.2.3	R/W (M)	R (O)		
MAXNOMATP upstream	7.3.1.2.4	R/W (M)	R (O)		
MAXRXPWR upstream	7.3.1.2.5	R/W (M)	R (O)		
CARMASK downstream	7.3.1.2.6	R/W (M)	R (O)		
CARMASK upstream	7.3.1.2.7	R/W (M)	R (O)		
VDSL2-CARMASK	7.3.1.2.8	R/W(M)	R (O)		
PSDMASK downstream	7.3.1.2.9	R/W(M)	R (O)		
RFIBANDS	7.3.1.2.10	R/W(M)	R (O)		
Upstream PSD mask selection	7.3.1.2.11	R/W (M)	R (O)		
PSDMASK upstream	7.3.1.2.12	R/W (M)	R(O)		
DPBOSHAPED	7.3.1.2.13	R/W(M)	R(O)		
UPBOSHAPED (UPBOPSD-pb, UPBOKL, UPBOKLF)	7.3.1.2.14	R/W (M)	R(O)		
UPBOSHAPED (UPBOKLREF-pb)	7.3.1.2.14	R/W (O)	R(O)		
VDSL2 PSD Mask Class Selection (CLASSMASK)	7.3.1.2.15	R/W(M)			
VDSL2 limit PSD Masks and Band plans Enabling (LIMITMASK)	7.3.1.2.16	R/W (M)			R(O)
VDSL2 US0 Disabling (US0DISABLE)	7.3.1.2.17	R/W (M)			
VDSL2 US0 PSD Masks (US0MASK)	7.3.1.2.18	R/W (M)			R(O)

Table 7-15/G.997.1 – Support of Line configuration parameters per Recommendation

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5	G.993.2
Power and Spectrum Usage						
MAXNOMPSD downstream			Y	Y	Y	
MAXNOMPSD upstream			Y	Y	Y	
MAXNOMATP downstream			Y	Y	Y	Y
MAXNOMATP upstream			Y	Y	Y	
MAXRXPWR upstream			Y	Y	Y	
CARMASK downstream			Y	Y	Y	
CARMASK upstream			Y	Y	Y	
VDSL2-CARMASK						Y
PSDMASK downstream					Y	Y
RFIBANDS					Y	Y
Upstream PSD mask selection			Y		Y	
PSDMASK upstream			Y (Annexes J/M)		Y (Annexes J/M)	Y
DPBOSHAPED					Y	Y
UPBOSHAPED (UPBOPSD-pb, UPBOKL, UPBOKLF)						Y
UPBOSHAPED (UPBOKLREF-pb)						<u>Y</u>
VDSL2 PSD Mask Class Selection (CLASSMASK)						Y
VDSL2 Limit PSD Masks and Band plans Enabling (LIMITMASK)						Y
VDSL2 US0 Disabling (US0DISABLE)						Y
VDSL2 US0 Masks Enabling (US0MASK)						Y (Annex A)

3) Impulse Noise Monitoring parameters

The following clauses contain the modifications and additions to G.997.1 necessary to manage an Impulse Noise Monitoring function for G.993.2.

a)   In clause 7.3.1, add the following line configuration parameters as clause 7.3.1.9:

7.3.1.9   INM configuration parameters

The following configuration parameters are defined to control the impulse noise monitor in the receive direction in the xTU. A downstream Impulse noise Monitor applies to the xTU-R, an upstream Impulse noise Monitor applies to the xTU-C.

7.3.1.9.1   INM Inter Arrival Time Offset (INMIATO)

This is the Inter Arrival Time Offset that the xTU receiver shall use to determine in which bin of the Inter Arrival Time histogram the IAT is reported. The valid values for INMIATO ranges from 3 to 511 DMT symbols in steps of 1 DMT symbol.

7.3.1.9.2   INM Inter Arrival Time Step (INMIATS)

This is the Inter Arrival Time Step that the xTU receiver shall use to determine in which bin of the Inter Arrival Time histogram the IAT is reported. The valid values for INMIATS ranges from 0 to 7 in steps of 1.

7.3.1.9.3   INM Cluster Continuation value (INMCC)

This is the Cluster Continuation value that the xTU receiver shall use in the cluster indication process described in 11.4.2.2.1/G.993.2. The valid values for INMCC range from 0 to 64 DMT symbols in steps of 1 DMT symbol.

7.3.1.9.4   INM Equivalent INP Mode (INM_INPEQ_MODE)

This is the INM Equivalent INP Mode that the xTU receiver shall use in the computation of the Equivalent INP, as defined in 11.4.2.2.1/G.993.2. The valid values for INM_INPEQ_MODE are 0, 1, 2 and 3.

b)   In clause 7.2.1, add the following performance monitoring parameters:

7.2.1.4   Near-end Impulse Noise performance monitoring parameters

7.2.1.4.1   INM INPEQ histogram 1..17 (INMINPEQ$_{1..17}$-L)

This parameter is a count of the near-end INMAINPEQ$_i$ anomalies occurring on the line during the accumulation period. This parameter is subject to inhibiting – see 7.2.7.13.

7.2.1.4.2   INM total measurement (INMME-L)

This parameter is a count of the near-end INMAME anomalies occurring on the line during the accumulation period. This parameter is subject to inhibiting – see 7.2.7.13.

7.2.1.4.3   INM IAT histogram 0..7 (INMIAT$_{0..7}$-L)

This parameter is a count of the near-end INMAIAT$_i$ anomalies occurring on the line during the accumulation period. This parameter is subject to inhibiting – see 7.2.7.13.

7.2.1.5   Far-end Impulse Noise performance monitoring parameters

7.2.1.5.1   INM INPEQ histogram 1..17 (INMINPEQ$_{1..17}$-LFE)

This parameter is a count of the far-end INMAINPEQ$_i$ anomalies occurring on the line during the accumulation period. This parameter is subject to inhibiting – see 7.2.7.13.

7.2.1.5.2 INM total measurement (INMME-LFE)

This parameter is a count of the far-end INMAME anomalies occurring on the line during the accumulation period. This parameter is subject to inhibiting – see 7.2.7.13.

7.2.1.5.3 INM IAT histogram 0..7 (INMIAT$_{0..7}$-LFE)

This parameter is a count of the far-end INMAIAT$_i$ anomalies occurring on the line during the accumulation period. This parameter is subject to inhibiting – see 7.2.7.13.

c)   Modify Table 7-1 as follows:

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

Name	End	Use at xTU-C	Use at xTU-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
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 ≥ 18 for one or more bearer channels **OR** LOS ≥ 1 **OR** SEF ≥ 1 **OR** LPR ≥ 1
SES-LFE	Far	M	O	FEBE ≥ 18 for one or more bearer channels **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
INMINPEQ$_i$-L	Near	O		Count of INMAINPEQ$_i$-L anomalies on the line
INMINPEQ$_i$-LFE	Far	O		Count of INMAINPEQ$_i$-LFE anomalies on the line
INMIAT$_i$-L	Near	O		Count of INMAIAT$_i$-L anomalies on the line
INMIAT$_i$-LFE	Far	O		Count of INMAIAT$_i$-LFE anomalies on the line
INMME-L	Near	O		Count of INMAME-L anomalies on the line
INMME-LFE	Far	O		Count of INMAME-LFE anomalies on the line
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.				

d)   Modify clause 7.2.7.2 as follows:

7.2.7.2   Threshold reports

A Threshold Report (TR) is an unsolicited error performance report from a ME over the Q-interface and from the xTU-R over the U-interface with respect to either a 15-minute or 24-hour evaluation period. TRs can only occur when the concerned direction is in the available state. At the Q-interface, TRs for near-end and far-end ES, SES and UAS parameters are mandatory and TRs for the other defined parameters are optional except for INM parameters, for which TRs are not defined. Threshold reports are not provided at the T-/S-interface.

TR1s shall occur within 10 seconds after the 15-minute threshold is reached or exceeded.

TR2s shall occur within 10 seconds after the 24-hour threshold is reached or exceeded.

e)   Modify clause 7.2.7.9 as follows:

7.2.7.9   Performance history storage in network elements

The parameters for ME performance history storage at the Q-interface that shall be supported are ES, SES and UAS. Performance history storage for the other defined parameters is optional.

There shall be a current 15-minute register (which can also facilitate the TR1 filter) plus a further N 15-minute history registers for each parameter in each ME. The N 15-minute history registers are used as a stack, i.e., the value held in each register is pushed down the stack one place at the end of each 15-minute period, and the oldest register value at the bottom of the stack is discarded.

The value of N for the parameters ES, SES and UAS shall be at least 16. For the other parameters, the value of N shall be at least 1 (i.e., only current and previous values are required). If INM parameters are supported, the value of N for those parameters shall be 1.

There shall be a current 24-hour register (which can also facilitate the TR2 filter) plus one previous 24-hour register for each parameter.

As a minimum, an invalid data flag shall be provided for each stored interval for each direction for each monitored transmission entity. For example:

An invalid data flag is set to indicate that the data stored is incomplete or otherwise invalid when:

*   The data in the previous and recent intervals has been accumulated over a period of time that is greater or less than the nominal accumulation period duration.
*   The data in the current interval is suspect because a terminal is restarted or a register is reset in the middle of an accumulation period.
*   The data is incomplete in an accumulation period. For example, an incoming transmission failure or defect may prevent complete collection of far-end performance reports.

The invalid data flag is not set as a result of register saturation.

f)   Modify clause 7.2.7.13 as follows:

7.2.7.13   Inhibiting performance monitoring parameters

For a given monitored entity, the accumulation of certain performance parameters is inhibited during periods of unavailability, during SESs or during seconds containing defects on that monitored entity. Inhibiting on a given monitored entity (e.g., ADSL ATM Data Path) is not explicitly affected by conditions on any other monitored entity (xDSL line). The inhibiting rules are as follows:

*   UAS and Failure Count parameters shall not be inhibited.
*   INM parameters shall be inhibited during a 1-second interval, if it contains one or more LOS defects, or one or more SEF defects, or one or more LPR defects.

- All other performance parameter counts shall be inhibited during UAS and SES. Inhibiting shall be retroactive to the onset of unavailable time and shall end retroactively to the end of unavailable time.

g) *Add the following lines to Tables 7-14 and 7-15:*

Table 7-14/G.997.1 – Line configuration profile

Category/Element	Defined in:	Q-Interface	U-C Interface	U-R Interface	T-/S-Interface
•••					
Failed short inits threshold 24 hours	7.3.1.8	R (O)	R (O)		
INM configuration parameters					
INMIATOds	7.3.1.9.1	R/W (O)		R/W (O)	R(O)
INMIATOus	7.3.1.9.1	R/W (O)			
INMIATSds	7.3.1.9.2	R/W (O)		R/W (O)	R(O)
INMIATSus	7.3.1.9.2	R/W (O)			
INMCCds	7.3.1.9.3	R/W (O)		R/W (O)	R(O)
INMCCus	7.3.1.9.3	R/W (O)			
INM_INPEQ_MODEds	7.3.1.9.4	R/W (O)		R/W (O)	R(O)
INM_INPEQ_MODEus	7.3.1.9.4	R/W (O)			

Table 7-15/G.997.1 – Support of Line configuration parameters per Recommendation

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5	G.993.2
•••						
Failed short inits threshold 24 hours		Y	Y	Y	Y	Y
INM configuration parameters						
INMIATOds						Y
INMIATOus						Y
INMIATSds						Y
INMIATSus						Y
INMCCds						Y
INMCCus						Y
INM_INPEQ_MODEds						Y
INM_INPEQ_MODEus						Y

h) *Add the following lines to Tables 7-22 and 7-23:*

Table 7-22/G.997.1 – Line performance monitoring parameters

Category/Element	Defined in:	Q-Interface	U-C Interface	U-R Interface	T-/S-Interface
. . .					
Failed short inits counter 24 hours	7.2.1.3.4	R (O)	R (O)		
Near-end (xTU-C) Impulse Noise Performance Monitoring Counters (current and previous 15-minute interval)					
INMINPEQ$_{1..17}$-L counter 15 minutes	7.2.1.4.1	R (O)			
INMIAT$_{0..7}$-L counter 15 minutes	7.2.1.4.3	R (O)			
INMME-L counter 15 minutes	7.2.1.4.2	R (O)			
Near-end (xTU-C) Impulse Noise Performance Monitoring Counters (current and previous 24-hour interval)					
INMINPEQ$_{1..17}$-L counter 24 hours	7.2.1.4.1	R (O)			
INMIAT$_{0..7}$-L counter 24 hours	7.2.1.4.3	R (O)			
INMME-L counter 24 hours	7.2.1.4.2	R (O)			
Far-end (xTU-R) Impulse Noise Performance Monitoring Counters (current and previous 15-minute interval)					
INMINPEQ$_{1..17}$-LFE counter 15 minutes	7.2.1.5.1	R (O)		R (O)	
INMIAT$_{0..7}$-LFE counter 15 minutes	7.2.1.5.3	R (O)		R (O)	
INMME-LFE counter 15 minutes	7.2.1.5.2	R (O)		R (O)	
Far-end (xTU-R) Impulse Noise Performance Monitoring Counters (current and previous 24-hour interval)					
INMINPEQ$_{1..17}$-LFE counter 24 hours	7.2.1.5.1	R (O)		R (O)	
INMIAT$_{0..7}$-LFE counter 24 hours	7.2.1.5.3	R (O)		R (O)	
INMME-LFE counter 24 hours	7.2.1.5.2	R (O)		R (O)	

**Table 7-23/G.997.1 – Support of Line performance monitoring
parameters per Recommendation**

Category/Element	G.992.1	G.992.2	G.992.3	G.992.4	G.992.5	G.993.2
...						
Failed short inits counter 24 hours		Y	Y	Y	Y	Y
Near-end Impulse Noise Performance Monitoring Counters (current and previous 15-minute interval)						
INMINPEQ$_{1..17}$-L counter 15 minutes						Y
INMIAT$_{0..7}$-L counter 15 minutes						Y
INMME-L counter 15 minutes						Y
Near-end Impulse Noise Performance Monitoring Counters (current and previous 24-hour interval)						
INMINPEQ$_{1..17}$-L counter 24 hours						Y
INMIAT$_{0..7}$-L counter 24 hours						Y
INMME-L counter 24 hours						Y
Far-end Impulse Noise Performance Monitoring Counters (current and previous 15-minute interval)						
INMINPEQ$_{1..17}$-LFE counter 15 minutes						Y
INMIAT$_{0..7}$-LFE counter 15 minutes						Y
INMME-LFE counter 15 minutes						Y
Far-end Impulse Noise Performance Monitoring Counters (current and previous 24-hour interval)						
INMINPEQ$_{1..17}$-LFE counter 24 hours						Y
INMIAT$_{0..7}$-LFE counter 24 hours						Y
INMME-LFE counter 24 hours						Y

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