ANNEX 9
(to the Report of SWP-4/13-1)

ITU Telecommunication Standardization Sector
Study Group 15
Experts Group for Video Coding and Systems
in ATM and Other Network Environments

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Liaison to Study Group 15

Question(s): 2/15

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TITLE: Liaison to SG 15 concerning ATM QoS. For action.

Subject: Liaison responding to AVC-781

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SG13, WP4 met during 10-21 July, 1995, and considered both the February, 1995, liaison on ATM network performance and the document requesting comments that was forwarded by Q2/15 from its May 1995 meeting.

The numbers presented in the following text do not represent official numbers from any national or international standards organization. Furthermore, the present liaison should not be taken as a formal approval of any of the numbers present in the present version of your document concerning network performance objectives.

Indeed, as the amount of test results is still not considered to be sufficient by Q16/13 Network Performance experts, this group has not yet decided on a set of performance objectives. It is however expected that the next release of Recommendation I.356, that is currently planned to be frozen at the next meeting of SG13 (April 1996), should contain such objectives.

1. As you rightly point out in the current version of your document concerning ATM performance scenearios, the end-to-end objectives of all I.356 network performance parameters (and not only CTD and CDV) depend on the characteristics of the considered connection, in terms of route length, technology, and complexity. Therefore, the specification of network performance objectives shall be done on the basis of a hypothetical reference connection (HRX) and on rules for apportionning performance objectives. The values provided in table 1 of your document do not appear to have any HRX specified and are thus ambiguous. Could you clarify the considered HRX(s) corresponding to the worst/average/best case in your document? Q16/13 experts are not in the position of providing any precise numbers, in particular concerning end-to-end CTD and CDV objectives, without this knowledge.

2. A contribution that has been addressed to our group points out that when using low bit rate links (DS3/STS-1), physical layer impairments may lead to CLR performance, for an end-to-end HRX, significantly worse than your estimated average CLR performance. Note that this proposed estimation of CLR is made assuming that no ATM nodes are crossed by the connection. It then appears that your average CLR objective (10^{-9}) may be overly optimistic, depending on the characteristics of your HRX. Furthermore, your best case value of 10^{-11} for a CLR objective may be considered unrealistic.

3. Moreover, if you intend to use any type of AALabove the ATM layer, it is felt necessary to take into account the effect AAL mechanisms on ATM performance impairments: for example, if AAL5 is used, any AAL PDU where a cell is lost is not delivered to the application. This means that an isolated cell loss may lead to an AAL PDU loss. It is currently understood within Q16/13 that the amount of isolated cell losses is quantified by the CLR parameter; bursts of cell losses are accounted by the SECBR parameter.

4. As pointed out in our previous liaison, BER is not an ATM layer performance parameter. Indeed, bit errors may lead either to cell errors or to cell losses. Isolated bit errors are quantified within the ATM layer by the CER parameter.

5. Q16/13 experts are currently considering the following definition for the SECB: the value N of the block size is uniquely determined by the Peak Cell Rate of the aggregate CLP=0+1 cell flow, so that there are approximately 25 cell blocks transmitted per second whenever the connection is operated at its negotiated PCR. The absolute minimum cell block size is 128 cells. The value of the threshold, M, for declaring a SECB is fixed to be N/16. We would greatly appreciate your comments on these proposed definitions.

6. We appreciate the fact that you are now specifying CDV in terms of cell transmission time. This specification is valid for any link rate. It is the common understanding within Q16/13 that low link rates lead to higher values of end-to-end CDV.

7. Q16/13 experts are however unsure of your definition of end-to-end CDV. We draw to your attention that the current understanding of the term "end-to-end CDV" within our group is related to the 2-point CDV parameter that quantifies the difference between two cell transfer delays. End-to-end CDV does not quantify the inter-cell arrival times at the receiving UNI.

8. Concerning low frequency (long term) and high frequency (short term) end-to-end CDV, it should be pointed out that high frequency CDV may be controlled by ATM nodes for connections that require this capability, by offering these connections a priority over other connections that are more tolerant to CDV. This is not done at the expense of low frequency end-to-end CDV that is felt to depend more on the daily variation of link loads than on any other factor.

9. CDV objectives must also be based on a precise HRX. Unless your best case CDV values assume an HRX with a very few (or no) queueing (switching, cross-connect) stages, your best case CDV values may be considered unrealistic.