

Annex B – Recommendations

For convenience of reading, this Annex groups together the recommendations made throughout the document.

B.1 Compression Issues – Recommendations

1. Compression algorithms and transport schemes should be based on Open Standards. This implies availability of the intellectual property necessary to implement those standards to all interested parties on a fair and equitable basis. Availability in the marketplace of chip sets and/or algorithms for software encoding and decoding may give users confidence in the adoption of particular compression methods.
2. The number of compression methods and parameters should be minimized for each uniquely defined application in order to maximize compatibility and interoperability.
3. Compliance testing methods should be available for those building equipment to standards for algorithms and transport schemes and for users purchasing and installing equipment to those standards. Standards bodies should adopt standards for compliance testing methods to support both manufacturer and user needs.
4. A single compression scheme used with different compression parameters throughout the chain should be decodable by a single decoder.
5. To support use of more than one compression family, the development of a common (“agile”) decoder is desirable.
6. Integration of video compression into more complex systems must be via standardized interfaces. Translating through ITU-R BT.601, i.e., decoding and re-encoding, is the default method of concatenating video signals compressed using different techniques and/or parameters, although other methods are possible.
7. The compression scheme chosen should not preclude the use of infrastructures based on the serial digital interface (SDI) as embodied in SMPTE 259M and ITU-R BT.656.
8. Issues related to interoperability must be further explored and standards developed to allow predictable levels of performance to be achieved in the implementation of specific applications.
9. Bit streams carrying compressed signals should be designed so that they can be formatted and packaged for transport over as many types of communications circuits and networks as possible.
10. Compressed bit streams are very sensitive to errors, and therefore it is recommended that appropriate channel coding methods and error protection be employed where necessary.
11. Compression systems should be designed so that, in normal operation, signal timing relationships (e.g., audio/video lip sync) and synchronization presented at encoder inputs are reproduced at decoder outputs.
12. Signal delays through compression processing (encoding/decoding) must be limited to durations that are practical for specific applications, e.g., live interview situations.
13. Provision should be made for selected analog vertical interval information to be carried through the compression system, although not necessarily compressed with the video. Additionally, selected parts of the ancillary data space of digital signals may carry data (e.g., Metadata), and provision should be made to carry selected parts of this data through a transparent path synchronously with the video and audio data.
14. The compression scheme chosen for devices that mimic VTRs should allow for the reproduction of pictures in shuttle mode for identifying content and of pictures in jog and slow motion modes for selecting edit points.
15. Network interfaces and storage devices should provide for both Variable Bit Rate (VBR) and Constant Bit Rate (CBR) options and must be capable of supporting a wide variety of data rates, as required by particular applications.
16. Storage devices should allow recording and playing back of streams and files as data rather than decoding to baseband for recording and re-encoding upon playback.
17. The compression strategy chosen for standard television should be extensible to high definition applications to allow for commonality in the transitional phase.

B.2 Wrappers and Metadata – Recommendations

1. The development of an extensible hierarchical classification of Metadata varieties, including the notion of Metadata Sets appropriate to particular uses.
2. The establishment of a single registry of Metadata identifiers and definitions.
3. The standardization of a single generic Wrapper format for streaming of Metadata, which can be mapped onto existing and emerging signal transport layers.
4. The standardization of a single generic Wrapper format for applications requiring arbitrary richness of Content of all types, including Metadata and Essence. This must be highly compatible with the streaming format described above.
5. The standardization of a single format for a “unique identifier” would also be of assistance; however it is recognized that multiple formats are already in use. As a minimum therefore, it should be possible to register existing and new unique identifier formats within the Metadata registry described above.

B.3 File Management, Transfer Protocols, and Physical Connections – Recommendations

In order to achieve interoperability between different vendors, which is a basic user requirement, the following standards need to be defined:

1. File Formats for guaranteed and bounded quality transfer
2. Link Protocols: e.g. protocols for different classes of service, transfer mode commands, transfer initiation commands, transfer phase commands, the format of data being interchanged, number of bits per element, type of encoding scheme, synchronization information
3. Flow Control: methods to control the flow of data between two devices (e.g. to avoid overflow of storage at the receiver)
4. Error Control: e.g. type of error detection and control
5. Inter-Layer commands: e.g. error messaging between different layers
6. Machine Control
7. Networks and interfaces
8. Payload and mapping documents
9. User interfaces
10. Platform independent command sets for file management