

5. ANNEX II – TECHNICAL STANDARDS

79. Video and audio communications conferencing equipment should meet minimum industry standards to facilitate interoperability locally and globally. The following are common industry standards (mostly by the International Telecommunications Union (ITU)).

Video

80. H.320 and H.310 standards for Video over ISDN. These standards include guidelines for video compression and transmission and for audio and control signals. When a video system of one manufacturer conferences with another brand, both video systems automatically revert to the common denominator of H.320. H.310 is the standard for faster ISDN connections.

81. H.323 Standard for Video over Internet. The H.323 standard provides a foundation for audio, video, and data communications across Internet protocol-based networks. By complying with H.323, multi-media products and applications of different origin can interoperate, allowing users to communicate without concern for compatibility.

Data Conference

82. T.120 Standard for Data Conference. The T.120 is a data sharing protocol for multipoint data communication in a multimedia conferencing environment. It enables white board collaborations, file transfers, graphic presentations and application sharing.

Picture and Audio

83. H.263 and H.264. Picture quality standard of 30 frames per second Common Intermediate Format (CIF) at between 336-384 kbps (kilobits per second). The standard of 30 frames per second ensures a near-broadcast quality picture. Examples of ITU standards that meet this requirement are H.263 and H.264.

84. H.239 - Picture-in-picture (PIP). Picture-in-picture or DuoVideo H.239, permits the codec to display at least two images on the monitor.

85. Standards for audio coding: G.711 (Pulse code modulation (PCM) of voice frequencies), G.722 (7 kHz audio-coding within 64 kbit/s); G.722.1 (Low-complexity coding at 24 and 32 kbit/s for hands-free operation in systems with low frame loss).

86. Echo cancellation microphones with a 100 to 7,000 Hz frequency response, audio muting, on/off switch and full-duplex audio.

87. H.281 - A far end camera control protocol for videoconferences using H.224. H.281 is the standard for local and far-end camera control protocol for ISDN (H.320) video conferencing, for camera(s) with ability to pan, tilt, and zoom, both manually and using presets.

Channels, Bandwidth and Bridging

88. Minimum of 6 channels for room videoconferencing systems using ISDN or video systems running as the sole application on a personal computer or larger room-type system should have the capacity to use 3 ISDN lines. This capacity is necessary to achieve 384 kbps at 30 frames per second. In general, the greater the bandwidth of the connecting circuits and processing power of the codec, the better picture quality especially in large screens.

89. Standards for Codecs: H.261, H.263 and H.264. The primary function of the codec is to compress and decompress video and audio. Multiple identical outputs can be provided from the single output system by a device commonly known as a "distribution amplifier."

90. Bandwidth On Demand Inter-Networking Group (BONDING) standards (ISDN and H.320 only) for inverse multiplexers. Inverse multiplexers combine individual 56K or 64K channels to create more bandwidth, which equals better picture quality.

91. H.243 - H.320/H.323 Standard for Bridging Technology. Multi-point bridging equipment is addressed under the standard H.243. The multipoint bridge connects all the participants by allowing a videoconferencing system to connect to more than two sites.

92. H.460 is a standard for the traversing of H.323 videoconferencing signals across firewalls and network address translation (NAT). H.460.18 and H.460.19 are standards that enable H.323 devices to exchange signaling and media across boundary imposed by NAT and firewalls.

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