VQEG Definitions

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Editorial History

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# . Definitions

**Intended frame rate** is defined as the number of video frames per second physically stored for some representation of a video sequence. The intended frame rate may be constant or may change with time. Two examples of constant intended frame rates are a BetacamSP tape containing 25 fps and a VQEG FR-TV Phase I compliant 625-line YUV file containing 25 fps; these both have an absolute frame rate of 25 fps. One example of a variable absolute frame rate is a computer file containing only new frames; in this case the intended frame rate exactly matches the effective frame rate. The content of video frames is not considered when determining intended frame rate.

**Anomalous frame repetition** is defined as an event where the HRC outputs a single frame repeatedly in response to an unusual or out of the ordinary event. Anomalous frame repetition includes but is not limited to the following types of events: an error in the transmission channel, a change in the delay through the transmission channel, limited computer resources impacting the decoder’s performance, and limited computer resources impacting the display of the video signal.

**Constant frame skipping** is defined as an event where the HRC outputs frames with updated content at an effective frame rate that is fixed and less than the source frame rate.

**Effective frame rate** is defined as the number of unique frames (i.e., total frames – repeated frames) per second.

**Frame rate** is the number of (progressive) frames displayed per second (fps).

**Live Network Conditions** are defined as errors imposed upon the digital video bit stream as a result of live network conditions. Examples of error sources include packet loss due to heavy network traffic, increased delay due to transmission route changes, multi-path on a broadcast signal, and fingerprints on a DVD. Live network conditions tend to be unpredictable and unrepeatable.

**Pausing with skipping** (formerly frame skipping) is defined as events where the video pauses for some period of time and then restarts with some loss of video information. In pausing with skipping, the temporal delay through the system will vary about an average system delay, sometimes increasing and sometimes decreasing. One example of pausing with skipping is a pair of IP Videophones, where heavy network traffic causes the IP Videophone display to freeze briefly; when the IP Videophone display continues, some content has been lost. Another example is a videoconferencing system that performs constant frame skipping or variable frame skipping. Constant frame skipping and variable frame skipping are subset of pausing with skipping. A processed video sequence containing pausing with skipping will be approximately the same duration as the associated original video sequence.

**Pausing without skipping** (formerly frame freeze) is defined as any event where the video pauses for some period of time and then restarts without losing any video information. Hence, the temporal delay through the system must increase. One example of pausing without skipping is a computer simultaneously downloading and playing an AVI file, where heavy network traffic causes the player to pause briefly and then continue playing. A processed video sequence containing pausing without skipping events will always be longer in duration than the associated original video sequence.

**Processed** is the reference stimuli presented through a system under test. [

**Reference** is the original version of each source stimuli. This is the highest quality version available of the audio sample, video clip, or audiovisual sequence.

**Refresh rate** is defined as the rate at which the computer monitor is updated.

**Rewinding** is defined as an event where the HRC playback jumps backwards in time. Rewinding can occur immediately after a pause. Given the reference sequence (A B C D E F G H I), two example processed sequence containing rewinding are (A B C D B C D E F) and (A B C C C C A B C). Rewinding can occur as a response to transmission error; for example, a video player encounters a transmission error, pauses while it conceals the error internally, and then resumes by playing video prior to the frame displayed when the transmission distortion was encountered. Rewinding is different from variable frame skipping because the subjects see the same content again and the motion is much more jumpy.

**Simulated transmission errors** are defined as errors imposed upon the digital video bit stream in a highly controlled environment. Examples include simulated packet loss rates and simulated bit errors. Parameters used to control simulated transmission errors are well defined.

**Source** is the content material associated with one particular audio sample, video clip, or audiovisual sequence (e.g., a video sequence depicting a ship floating in a harbor).

**Source frame rate (SFR**) is the intended frame rate of the original source video sequences. The source frame rate is constant.

**Transmission errors** are defined as any error resulting from sending the video data over a transmission channel. Examples of transmission errors are corrupted data (bit errors) and lost packets / lost frames. Such errors may be generated in live network conditions or through simulation.

**Variable frame skipping** is defined as an event where the HRC outputs frames with updated content at an effective frame rate that changes with time. The temporal delay through the system will increase and decrease with time, varying about an average system delay. A processed video sequence containing variable frame skipping will be approximately the same duration as the associated original video sequence.

# . Abbreviations and acronyms

HRC hypothetical reference circuit

SFR source frame rate

SRC source