

Appendix 1D – Production and Technical Standards

1. Rules of Coverage

Content produced by the Service Provider shall follow the Rules of Coverage. A copy of the current Rules of Coverage is provided in **Error! Reference source not found..** These Rules of Coverage are correct at time of issue of this RFT. Rules of Coverage are subject to change from time to time. The Service Provider shall always be responsible for production of content compliant with the Rules of Coverage prevailing.

In line with the adoption of an IP-based production environment, the Service Provider shall ensure that coverage workflows remain fully compliant with prevailing Rules of Coverage, regardless of transport mechanism (SDI or IP).

Coimisiún na Meán (Media Commission) – Subtitling, ISL & Audio Description Targets
Under the Broadcasting Act 2009, Coimisiún na Meán sets out formal access rules for licensed broadcasters:

Access Rules (Revised 2021):

Require broadcasters to provide increasing levels of:

- Subtitling (for deaf/hard of hearing)
- Irish Sign Language (ISL) interpretation
- Audio description (for visually impaired audiences)
- These are binding on broadcasters and published in annual compliance reports.
- Broadcasters and programme makers in Ireland are therefore expected to:
- Mix audio to ensure dialogue is clear and intelligible
- Avoid masking key speech or voiceovers with background music or effects
- Provide subtitles or captions for key dialogue
- Use text graphics that are legible, with sufficient contrast and duration
- Deliver content in formats suitable for downstream subtitling and audio description workflows

This is both a regulatory requirement (especially for broadcasters) and a best practice expectation aligned with Ireland's commitments under the UN Convention on the Rights of Persons with Disabilities (CRPD).

2. Subjective technical quality

Subjective assessment methods are used to establish the performance of television systems using measurements that more directly anticipate the reactions of those who might view the systems tested.

In IP-based systems, the Service Provider shall ensure mechanisms are in place to monitor and mitigate packet-based impairments (e.g. loss, jitter, latency), which may impact subjective quality

Subjective quality of impairments to vision and sound content produced under the Televising Contract shall be assessed using the Rec. ITU-R BT.500-11 (formerly CCIR) 5-point scale (half-grades are permissible). This scale is reproduced below for convenience:

Grade	Quality	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible but not annoying
3	Fair	Slightly annoying
2	Poor	Annoying
1	Bad	Very annoying

It is expected and required that new content produced under the Televising Contract shall meet a minimum subjective technical quality of Grade 4. to the extent that such is under control of the Service Provider. Content produced under prior Televising Contracts shall, where re-used, meet a minimum Grade 3.

3. General Production Standards - Vision

- a)** To the extent that such matters are under the control of the Service Provider, the following vision standards shall apply:
- b)** a) Image Clarity and Sharpness: Video images of proceedings in the chambers and committee rooms must be sharp and natural. Excessive electronic detail enhancement (artificial sharpening) must be avoided. Lighting must be adequate and evenly distributed to enable camera lenses to operate within their optical “sweet spot” where feasible.
- c)** Optical Integrity: Images shall be free from lens flare, chromatic aberration, reflections, lens dirt, markings, or physical obstructions. Cameras must be maintained to professional broadcast standards to ensure optimal optical performance.
- d)** Dynamic Range and Colour Fidelity: Images must avoid excessive black crushing and highlight clipping. Skin tones should be rendered naturally and consistently, with accurate colour reproduction based on ITU-R BT.709 (for HD) or BT.2100 (for UHD HDR) standards, as applicable. All cameras within a chamber must be closely

matched in exposure, white balance, and colour matrix to ensure visual consistency across multi-camera shots.

- e) **Image Stability and Artefact Suppression:** There shall be no visible horizontal or vertical aliasing, interlace artefacts, or moiré effects on fine detail. Video must be stable and free of any unintentional jumps, flickers, level shifts, or flash frames unless justified editorially. Contouring, macroblocking, banding, or any other visible artefacts from digital processing or compression must be avoided.
- f) **Aspect Ratio and Legacy Content Handling:** The standard aspect ratio for all new recordings is 16:9 Full Height Anamorphic (FHA). Archive content originally captured in 4:3 should be converted to 16:9 using appropriate pillarboxing or scaling methods to ensure consistent presentation within edited sequences. Archive material migrated to the Digital Archive shall retain its original aspect ratio
- g) **Video Processing Consistency:** All video processing devices (e.g., vision mixers, frame synchronisers, effects units) must preserve luminance and chrominance levels within acceptable broadcast tolerances and not introduce visible timing discrepancies or level shifts during transitions.
- h) **Lip Sync Accuracy:** Audio and video alignment must be maintained. When latency differences occur, audio delay must be applied to ensure lip-sync is within ± 1 video frame tolerance. Audio must never precede video.
- i) **Editing and Timing Standards:** All cuts must occur on clean frame boundaries. Progressive video (or film-originated content) should exhibit frame-based motion with consistent cadence. Where interlaced video is used, field dominance shall be maintained (i.e. field 1 dominance).
- j) **Where IP transport is used, camera and vision system timing must be aligned via SMPTE ST 2059 (PTP), ensuring frame-accurate sync across all sources."**

4. Video Line-Up

Programme video levels must be accurately aligned and calibrated with their associated reference line-up signals.

- a) **Test Signal Standard:** Video line-up signals shall consist of EBU-standard colour bars, either 100% or 75% amplitude (i.e., 100/0/100/0 or 100/0/75/0 format), filling the full 16:9 raster. The colour bar signal must be compliant with ITU-R BT.709 for HD or BT.2100 for UHD where applicable.
- b) **Signal Consistency:** Line-up signals must be generated from a stable, broadcast-grade source and reflect the same picture timing, aspect ratio, and signal path characteristics as the associated programme video. They must be free of artefacts, dropouts, or visible instability.
- c) **Reference Matching:** Programme video luminance and chrominance levels must correspond accurately to the levels indicated by the associated line-up signal. Any adjustments in the signal path (e.g. through vision mixers, routers, or encoders) must not introduce level shifts, gamma distortion, or timing inconsistencies between line-

up and programme content.

- d)** Raster Format: All test signals must occupy the full active raster (1920x1080 for HD, 3840x2160 for UHD) and be delivered in the appropriate interlaced or progressive scan format, matching the transmission standard of the parliamentary video service.
- e)** Identification: Where appropriate, the line-up signal shall include a centre cross marker and an audio tone reference (typically 1kHz at -18 dBFS for digital systems), accompanied by a slate or ident to indicate source origin, date, and time.

Line-up must validate both signal integrity and network performance (e.g. latency consistency, PTP sync status) in addition to visual calibration.

5. Video Levels and Gamut (illegal signals)

Standard Definition (SD) digital video signals shall be assessed in accordance with ITU-R BT.601-7 Part A (superseding BT.601-5), which defines the encoding parameters for YCbCr component digital video systems.

- a)** Digital Video Levels: Signal levels must be received within the defined legal limits to ensure programme material is suitable for immediate use without correction. Any signal exceeding these limits shall be classified as a gamut error.

- b)** Measurement Method: Signal compliance must be verified using calibrated waveform monitors capable of displaying video levels as either:

- Millivolt equivalents (simulating analogue component levels), or
- Percentage values relative to nominal black and white levels.

Such instruments must support standard markers for 8-bit (0–255) and 10-bit (0–1023) systems, with a focus on:

- Digital black: Level 16 (8-bit) / 64 (10-bit)
- Digital white: Level 235 (8-bit) / 940 (10-bit)

- c)** Nominal Ranges (Analogue Reference Equivalents):

- Black level corresponds to 0% or 0mV for each RGB component.
- White level corresponds to 100% or 700mV for RGB.

In a legal signal, each RGB or YCbCr component must fall within the range:

- 0–100% (0–700mV analogue equivalent)
- 16–235 (8-bit digital)
- 64–940 (10-bit digital)

- d)** Permissible Tolerances – EBU R103 Compliance: Recognising the practical limitations of digital processing and compression pipelines, a small tolerance for out-of-gamut values is acceptable. As per EBU Recommendation R103, the following boundaries apply:

- RGB components: Must lie between -5% and +105% (i.e. -35mV to 735mV)

- Luminance (Y): Must lie between -1% and +103% (i.e. -7mV to 721mV)
Signals exceeding these ranges must be corrected prior to distribution or archive ingest, unless their use is justified and documented for editorial or technical reasons.

- e) Monitoring and Logging: All measurement equipment used for QC must be regularly calibrated. Where applicable, automated QC systems should log and flag persistent gamut excursions for review.

For IP systems transmitting uncompressed video (e.g. SMPTE ST 2110-20), the same legal video level compliance and gamut monitoring apply as with SDI.

6. Aspect Ratio

All Standard Definition (SD) programme content must be delivered in 16:9 Widescreen (anamorphic) format. The active picture area must fully occupy the 16:9 raster, both vertically and horizontally, without geometric distortion or stretching.

- must be centrally framed in the 16:9 raster,
- must show no geometrical distortion,
- must have clean and sharp pillar-box edges (i.e. any video or film edge artefacts may need to be
- blanked), and
- must be black outside the active picture, unless otherwise specified by the broadcaster.

Archive material must meet all the technical requirements in this document, including those for up converted SD video where relevant.

7. Caption Safe Area 16:9

For IP systems transmitting uncompressed video (e.g. SMPTE ST 2110-20), the same legal video level compliance and gamut monitoring apply as with SDI. Captions can fill the full 16x 9 images leaving a pixel safety margin of 10% horizontal and 5% vertical.

All on screen text must be clear and legible and must be within the safe areas specified. All font sizes must be legible after down conversion. Caption positioning should consider both SDI and IP display chains and ensure compatibility with downstream IP-based caption insertion or OTT playout systems.

8. Photosensitive Epilepsy (PSE)

Every programme for transmission must satisfy the Photosensitive Epilepsy guidelines. Flickering or intermittent lights and certain types of repetitive visual patterns can cause

serious problems for viewers who are prone to photosensitive epilepsy. Children and teenagers are particularly vulnerable. OIR-TV adopts the Ofcom BROADCASTING CODE 2009, which states: Section 2: Harm and Offence: 2.12 Television broadcasters must take precautions to maintain a low level of risk to viewers who have photosensitive epilepsy.

Where it is not reasonably practicable to follow the Ofcom guidance (see the Ofcom website), and where broadcasters can demonstrate that the broadcasting of flashing lights and/or patterns is editorially justified, viewers should be given an adequate verbal and also, if appropriate, text warning at the start of the programme or programme item. The Ofcom guidance is at:

<http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/813060/section22009.pdf>

9. General Production Standards - Sound

To the extent that such is under control of the Service Provider:

- a)** Live audio will be captured as stereo or dual channel mono. Where production needs dictate 4 channel audio may be required for a full broadcast mix on Ch.1-2 and effects on Ch. 3-4;
- b)** Sound will be recorded with appropriately placed microphones, capturing minimum background noise. Live and recorded audio must be free of spurious signals such as clicks, noise, hum and any analogue distortion. The audio must be reasonably continuous (no muted silence) and consistent in level and loudness;
- c)** Audio levels must be appropriate for the scene and dynamic range must not be excessive. Dynamic range shall be suitable for the general range of office and domestic listening conditions;
- d)** Care shall be taken when balancing ambience with voice in order to preserve good intelligibility. The sound shall not exhibit dynamic and / or frequency response artefacts - as a consequence of equalising / processing / applying compression algorithms especially low-bit rate compression;
- e)** Any digital data compression of audio shall be used sparingly and at all times in a considered manner, to maintain as far as is practicable the integrity and quality of the original audio;
- f)** Programme audio levels shall always be measured by Peak Programme Meters (PPM) to BS 5428. BBC-type PPMs to this standard are scaled in 4 dB steps numbered from 1 to 7 with increasing signal level. They are calibrated so that Line-up (Reference) Level will read PPM 4 and thus Peak Programme (Maximum) Level shall not exceed PPM 6 (see below);
- g)** PPM 6 is the maximum sound level. Reference Level shall represent a level which is 8dB less than the maximum allowed during the programme as measured with a PPM. Within the OBU, Reference Level is referred to as “Zero Level”, “Line-up Level”, “0

dB”, “0 dBu” or PPM4 and represents an analogue voltage of 0.775 V RMS across a high-impedance (>10 kOhm) resistive load;

- h)** Where applicable, Digital Audio Reference Level is defined as 18 dB below the maximum coding value (-18 dBFS) as per EBU recommended practice R68;
- i)** Where applicable, Mono derived from Stereo shall be derived according to: “Mono = (L+R) - 6dB”;
- j)** Peak levels shall be measured using PPMs and, where supported, loudness shall be monitored in accordance with EBU R-128 using compliant meters, particularly in file-based or OTT-ready workflows.

10. Sound to Vision Synchronisation

The relative timing of sound to vision should not exhibit any perceptible error. Sound must not lead or lag the vision by more than 5 ms. Audio / Video sync markers. Audio Line-up will be all tracks at -18dB (standard zero level).

IP-Based Signal Transport and Synchronisation; With the adoption of IP-based media transport (e.g. SMPTE ST 2110), the Service Provider shall ensure: Use of Precision Time Protocol (PTP) for synchronisation across all AV equipment (per ST 2059). IP-compatible QC tools are employed for real-time monitoring of media streams (e.g. ST 2110-20 video, -30 audio). Redundancy and seamless protection switching are supported to maintain continuous service.

Technical Standards

11. Video, Audio and Timing Standards

Video Standards

SMPTE ST 2110 (IP-based)

A suite of standards for transporting video, audio, and ancillary data over IP networks in real-time.

- ST 2110-10: System timing and synchronization
- ST 2110-20: Uncompressed video over IP
- ST 2110-21: Traffic shaping and delivery timing
- ST 2110-30: Audio over IP (see audio section)
- ST 2110-40: Ancillary data (e.g., captions, timecode)

Resolution Support: SD, HD, 3G-HD, UHD

Compression: Uncompressed

SMPTE ST 259 / 292 / 424 / 425 (SDI-based)

- ST 259: SD-SDI (Standard Definition)
- ST 292: HD-SDI (up to 1.5 Gbps)
- ST 424: 3G-SDI (up to 1080p)

- ST 425: 3G-SDI Level A and B mapping for 1080p video

Still widely used for SD and HD baseband video in traditional or hybrid SDI-IP facilities.

Audio Standards

SMPTE ST 2110-30 (Audio over IP)

- Based on AES67, this standard enables uncompressed linear PCM audio streams over IP.
- Supports multichannel formats including stereo, 5.1, and 7.1.
- Synchronized using PTP (Precision Time Protocol).

AES67 (AoIP Interoperability)

- An interoperability standard for professional Audio over IP systems.
- Ensures seamless integration between vendors such as Dante, Ravenna, Livewire+, and others.
- Used in both broadcast and live sound environments.

Dante (by Audinate)

- A widely adopted proprietary AoIP protocol.
- Uses standard IP networks for high-quality, low-latency audio.
- Natively compatible with AES67 for interoperability.
- Commonly used in both broadcast and corporate AV settings.

AES3 (AES/EBU)

- A digital audio transmission standard using XLR (balanced) or BNC (unbalanced) connectors.
- Frequently used for inter-device digital audio connections in baseband workflows.

Analogue Audio Standards

- Standard professional analogue audio is typically line-level at:
- +4 dBu balanced (professional standard)
- -10 dBV unbalanced (consumer level)
- Balanced connections are typically made using XLR or TRS connectors.
- Still used in some baseband environments or as failover paths in critical systems.

Synchronization and Timing Standards

SMPTE ST 2059

- Defines use of PTP (IEEE 1588-2008) to synchronize IP-based media devices.
- Provides frame-accurate sync for video, audio, and ancillary streams.
- Replaces traditional sync sources like blackburst in IP environments.

Other Timing Protocols and References

- PTP (Precision Time Protocol): Primary IP-based synchronization protocol for

SMPTE ST 2110 systems.

- NTP (Network Time Protocol): Used for non-time-critical synchronization (e.g., clocks, logs).
- Black & Burst: Analog video sync signal used in SD environments and as reference for SDI-based systems.
- Tri-Level Sync: High-precision sync reference used in HD and 3G-SDI environments, offering better timing accuracy than blackburst.

12. Transmission

Material recorded in the transmission system is also standard definition and compressed using video: 10Mbit/s MPEG2 SD; Resolution (720x576). Audio: MPEG Layer 2, stereo, 256Kbit/s.

13. Long term recording

Material recorded in the Avid system is high definition compressed at 50Mbit/s XDCAM HD 4:2:2 Long GOP in an MXF wrapper.

Audio is uncompressed.

The browse proxy standard can be set 1 or 2Mbit/s H264 for video, MPEG1 Layer 2 @192Kbit/s for audio in MP4 wrapper.

14. Archive

All recent material since 2018 is stored on LTO-8 tape at 50Mbit/s XDCAM HD 4:2:2 Long GOP in an MXF wrapper.

Proxy copies are not archived.

Legacy SD material (pre 2018) in the archive is recorded at 50Mbits/s MPEG 2 (IMX 50) conforming to the SMPTE 356M standard.

15. Metadata

Material is recorded into the Avid Recording and Editing system and additionally in the Simeia TX systems. Only the material recorded into the Avid system is archived. Material is recorded in chunks, the size of which is user configurable. The names of the recordings provide useful metadata and follows this convention.

- Control Room_Date_Time_Type.Segment.Extension

- Control Rooms can be DAIL,SEANAD, CR1,CR2,CR3,CR4, STUDIO1,STUDIO2.
- Date is the date the file was created in YYYYMMDD
- Time is the time the recording was started in HHMM using 24-hour clock
- Type is either CLEAN or DIRTY
- Segment is the segment number created by the Avid system. The format is .01, .02, .nn
 - Extension is always. MXF

Additional material is added at recording time in the galleries. This is added as Markers in Avid Media Central.

A black marker is added for an Item of Business (IOB) and the IN timecode is stored

A while marker is added for the speakers name and the IN timecode is stored

A red marker is added to indicate that a Private/ Quorum/ Vote session and the In timecode is stored.

When the material is later reviewed the markers are displayed on the timeline and the fields are searchable for IOB, speaker, chamber, date, time etc.

Legacy metadata from the old IBIS system has been migrated to the Avid database and includes the following fields in the Avid database.

Field	Example/ Explanation
Title	CR3_20180904_1350_04
File ID	CR3_20180904_1350_04
Creation Date	04/09/2018
Timecode IN	19:50:00:00
Timecode Out	21:50:00:00
Speaker	Name of Speaker
Guest	Name of Guest
Items of Business	Business Agenda e.g. Leaders Questions (A drop down list of options)
POI Caption	Title of the Committee or simply Dail or Seanad
POI Description	Title of the Bill being debated
POIIds	Not used generally
Subject	Used for Question Number i.e. Question 1
Shotlist	Used for Amendments i.e. Amendment 1
Clip Description	Not used generally