QC REQUIREMENTS FOR TESTING FILES AGAINST THE ITV STUDIOS GLOBAL PARTNERSHIPS TECHNICAL DELIVERY SPECIFICATION

This document describes the checks set out by ITV Studios Global Partnerships to test programmes delivered as files against the *Delivery Requirement for the Supply of ITV Studios Global Partnerships Content*. These checks are divided into two distinct types:

- Automated QC (AQC) checks

- Technical Assessment Report (Eyeball QC) in accordance with ITU BT.500 5 Point Grading Recommendation. A summary of the assessment is shown below.

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

Any impairments graded 1 - 4 must be recorded on the QC report referenced to timecode. Comments should be added summarising the issue and if any remedial work has been carried out to resolve or minimise the perceptibility. Programmes should meet a minimum of grade 4 for sound and vision quality. Grade 3 is borderline, where there may be valid reasons for technical exemption, in such cases, details must be referred back to ITV Studios for sign off. Grades 1 and 2 are automatic fails. Any grades 1-3 signed off by production must be communicated to ITV Studios and signed off before delivery.

The **entire file** must be assessed including any additional assets after the main programme, such as textless elements.

Tier 1 Visual (Eyeball) QC Assessment

Where both 5.1 and Stereo audio mixes are included in the master deliverable, the QC operator must conduct the following assessment.

- Full end to end assessment of main picture with stereo mix
- Full end to end assessment of main picture with stereo M&E
- Spot check of stems and 5.1 mix (main and M&E) checking for sync
- Check all text is within the title safe area
- Full assessment of textless elements, checking for sync, picture grade and correct Dolby metadata* referenced to the main picture.
- Full assessment of any recaps and teasers checking sync, picture grade and correct Dolby Metadata*
- Spot checks must include checking line-up bars and tone.

   *Where applicable

Tier 2 Visual (Eyeball) QC Assessment

Where both 5.1 and Stereo audio mixes are included in the master deliverable, the QC operator must conduct the following assessment.

- Full end to end assessment of main picture with stereo mix
- Spot check of main picture with stereo M&E
- Spot check of stems and 5.1 mix* checking for sync
- Check all text is within the title safe area
- Full assessment of textless elements, checking for frame accuracy and picture grade against the main picture.
- Full assessment of recaps and teasers checking for picture grade
- Spot checks must include checking line-up bars and tone.

   *Where applicable

1. Automated QC (AQC) Checks

1.1 - ITV Studios Global Partnerships ProRes 422HQ (HD SDR) or ProRes 4444 (UHD HDR) File Information Checks

All ITV Studios Global Partnerships content delivered as files must pass file format checks. These checks form part of the process carried out by ITV Studios Global Partnerships on receipt of a programme file. This check is an automated QC process.

1.2   ITV Studios Global Partnerships Video & Audio Content Checks

The AQC checks are linked to the requirements in the ITV Studios Global Partnerships Technical Delivery Specification. Each check has a link to the relevant section in the current version of the delivery document. Please check you have downloaded the latest version of the *Delivery Requirement for the Supply of ITV Studios Global Partnerships Content* available [here](#)

All the checks will either provide a pass or a fail level.

Pass   Meets the test criteria.

Fail   Does not meet the test criteria and is divided into three levels.

Mandatory   Tests must be passed to meet the basic delivery standards. If a programme fails on one of these tests, it must be fixed before delivery to ITV Studios Global Partnerships. It is incumbent on the post-production provider to ensure that they deliver a compliant file, and will fix any errors otherwise the file will be rejected and re-delivery will be requested, at no additional cost to ITV Studios. Post-production technical support will understand the requirements for technical mandatory tests.

Technical warnings   All technical warnings should be reviewed in a suitably controlled environment and fixed if at all possible. These problems may have a technical cause which can be fixed. If not, then you must warn ITV Studios Global Partnerships about the problem. If any of these checks fail and cannot be repaired, or are part of any intentional video or audio effect, they must be noted with timecodes in either the AQC Report or the Eyeball Technical Assessment Report.

Editorial warnings

Editorial Warnings indicate problems which may harm viewers' enjoyment of your content. However, they may also be unavoidable; for example footage of the moon landings may trigger a few of these warnings, but it's still editorially justified to include this footage in your documentary on space exploration. **You must review these warnings** and if you decide to accept them without fixing, they must be noted with timecodes, in either the AQC Report or the Eyeball Technical Assessment Report.

Notes:

- Currently there is no ITV Studios Global Partnerships approved AQC test template. You must ensure your test template aligns with the requirements outlined in the tables below.
- Some AQC devices will include testing of the ProRes essences. If your AQC device does not have the ability to check ProRes, you may uncheck the Video Codec parameter*

ITV Studios Global Partnerships UHD HDR Video Requirements

Description	Required Value	Result Reported?
Video Codec Profile	Apple ProRes 4444	Mandatory
Container	MOV (all files must have a .mov file extension)	Mandatory
Stream Type	QuickTime	Mandatory
Video Frame Rate	25p or 50p (for other frame rates, please consult your GP rep)	Mandatory
Resolution	3840x2160	Mandatory
Scanning	Progressive	Mandatory
Bit Depth	12 bit for Dolby Vision	Mandatory
Encoding Profile	High	Mandatory
Video Compression Mode	VBR	Mandatory
Video Colour Space	YUV (YCbCr)	Mandatory
Colorimetry	ITU-R BT.2100	Mandatory
Pixel Aspect Ratio	Square	Mandatory
Frame Structure	i-frame only	Mandatory
Chroma Sampling	Minimum of 4:4:4	Mandatory
Timecode	Content should be delivered with a 10:00:00:00 timecode. Timecode should remain continuous and uninterrupted until the end of the recording. For native 23.98 or 29.97 content hour 01:00:00:00 timecode start is acceptable.	Mandatory
Audio Tracks	Requirement of 24 audio tracks as outlined in Section 4.5.1 of the ITV Studios Global Partnerships Delivery Requirements	Mandatory

Notes:

- Associated Dolby Vision sidecar metadata must be assessed for conformity to the ***ITV Studio Global Partnerships Delivery Requirements***.
- Dolby metadata files must be validated using Dolby Vision Metafier before delivery.

ITV Studios Global Partnerships HD Video Requirements

Description	Required Value	Result Reported?
Video Codec Profile	Apple ProRes 422 (HQ)	Mandatory
Container	MOV (all files must have a .mov file extension)	Mandatory
Stream Type	QuickTime	Mandatory
Video Frame Rate	50i or native frame rate if different to this. 23.98 PsF, 24 Psf, 29.97 PsF and 59.94i frame rates are all permitted. If your HD content has been progressively captured, then please consult your GP rep.	Mandatory
Resolution	1920x1080	Mandatory
Scanning	As per Source. Interlaced or Progressive. Mixed Material may only be delivered with prior approval from ITV Global Partnerships. The file must be accompanied with a comprehensive schedule specifying the timecode of the relevant sections.	Mandatory
Bit Depth	10 bit	Mandatory
Video Bitrate	Typically 185Mb/s for 50i content (set by relevant encoding profile)	Mandatory
Video Compression Mode	VBR	Mandatory
Video Colour Space	YUV (YCbCr)	Mandatory
Pixel Aspect Ratio	Square	Mandatory
Frame Structure	i-frame only	Mandatory
Intra Frame Distance	1	Mandatory
Chroma Sampling	4:2:2	Mandatory
Timecode	EBU timecode should be recorded on all material. Timecode should remain continuous and uninterrupted until the end of the recording.	Mandatory
Audio Tracks	Requirement of 24 audio tracks as outlined in Section 4.5.1 of the ITV Studios Global Partnerships Delivery Requirements	Mandatory

Audio AQC Requirements

Test Description	Description	Category	Fail Level	EBU Code	Required Value	Tolerance	Result Reported?
Audio clipping	Digital signal "overload" Audio will sound distorted.	Audio	Editorial warning	0005B		≤ 250ms (12000 samples)	If present
Audio dropout	Short unintentional digital holes in the audio.	Audio	Editorial warning	0008B		≤ 5ms	If present
Programme loudness	Integrated loudness must target –23LUFS.	Audio	Mandatory	0010B	-23 LUFS	±1 LU	Mandatory
Dialnorm to loudness mismatch	Measured loudness must match metadata.	Audio	Technical warning	0010X		± 1 LU	Mandatory
Audio phase error	Phase differences which cause audible cancellation in mono.	Audio	Mandatory	0012B	0°	± 90°	
Maximum true peak (audio) level (dBTP)	Maximum audio level allowed.	Audio	Mandatory	0084B	-1 dBTP (It is recommended that levels do not exceed -3 dBTP)	+0 LU	

Video AQC Requirements

Test Description	Description	Category	Fail Level	EBU Code	Required Value	Tolerance	Result Reported?
Coloured Frames (including black frames)	Warning of a full frame of colour or black for a short period.	Video	Editorial warning	0016N		≤ 2 frames	If present
Freeze frames	Warning of static shots.	Video	Editorial warning	0044N		≤ 3s (75 frames)	Mandatory
Test Patterns	Warning that test patterns (e.g. colour bars) have been detected during the programme	Video	Technical warning	0052N		0 frames	If present
Scanning (video artefacts from incorrect scanning mode)	Signal format should be Interlace but it can carry progressive of PSF video formats.	Video	Technical warning	0048B	Interlaced		Mandatory
Video dropout	Small video dropouts, such as small black squares that might appear for a frame or two.	Video	Technical warning	0039B		≤ 2% of pixels across 1 or more frames (2 or more fields)	If present
Video Signal Levels (including Colour gamut)	Makes sure video and colour levels are not too large. Errors need to be 'legalised'.	Video	Mandatory	0051B	**Luminance > 1% pixels (low pass filtered EBU R103)** HD - 10bit between 55 and 966 (-1% to 103%) SD - 8bit between 14 and 242 (-1% to 103%) **Chrominance** (RGB) **> 1% pixels (low pass filtered EBU R103)** HD - 10bit between 20 and 984 (-5% to 105%)		

					SD - 8bit between 5 and 246 (-5% - 105%)	
Field order (video artefacts from incorrect field order)	Fields appear in the wrong order which causes unpleasant motion errors.	Video	Mandatory	0041B	Top field first	

2. ITV Studios Global Partnerships Eyeball QC Content Check Requirements

The Eyeball checks are linked to the requirements outlined in the ***ITV Studios Global Partnerships Technical Delivery Guidelines***. Each check has a link to the relevant section in the current version of the delivery document. Please check you have downloaded the latest version of the ITV Studios Global Partnerships Delivery Requirements here

All the checks will either give a pass or a fail level.

Pass   Meets the test criteria.

Fail   Does not meet the test criteria but is divided into three levels.

Mandatory	In the Eyeball check these QC Items are usually about programme layout, slate or clock information, audio channel order etc. These MUST be corrected before ITV Studios Global Partnerships can accept your programme.
Technical warnings	Technical warnings are usually technical issues, which cannot yet be detected by an AQC device (aspect ratio errors, poor image quality, focus errors, lip sync errors etc.). They should be fixed wherever possible but if not they should be noted in the Eyeball QC Report along with the reason for not fixing.
Editorial warnings	Editorial Warnings would include silence, captions or credits spelling, pillar-box or letterbox images etc. that may be distracting. These should normally be fixed but where they are editorially justifiable, they must be noted with timecodes, in the Eyeball QC Report.

Notes:
- The Eyeball QC check should be carried out in a suitable environment that has good sound insulation and controllable lighting.

# 3. Eyeball Viewing Environment Guidance

The viewing should be carried out using a good quality video monitor (minimum size 24") that is regularly calibrated with broadcast monitor test signals (e.g. PLUGE, Testcard etc.) There should be external high quality speakers properly positioned for stereo or surround sound monitoring. The most likely means where the viewing will take place will be in an edit suite or a dubbing theatre with suitable quality video monitoring.

Viewing distance should be no more than 3H (3 times the height of the screen) and the viewing position should be directly in front of the screen, preferably with the viewer's eyes perpendicular to the display horizontally and vertically.

The room should have reasonable sound dampening to minimise external interference and audio reflections and controlled lighting to minimise screen reflection.

Screen Size		Approximate 3H
24"	60cm	0.89m
28"	71cm	1.04m
36"	91cm	1.34m
42"	107cm	1.57m
47"	119 cm	1.75m
50"	127 cm	1.87m

Speaker	Height	Horizontal Angle	Inclination
C	1.2m*	0°	0°
L & R	1.2m*	30°	0°
LS &* RS	≥1.2m*	110 - 120°	0° to 15° down

4. Audio Monitoring
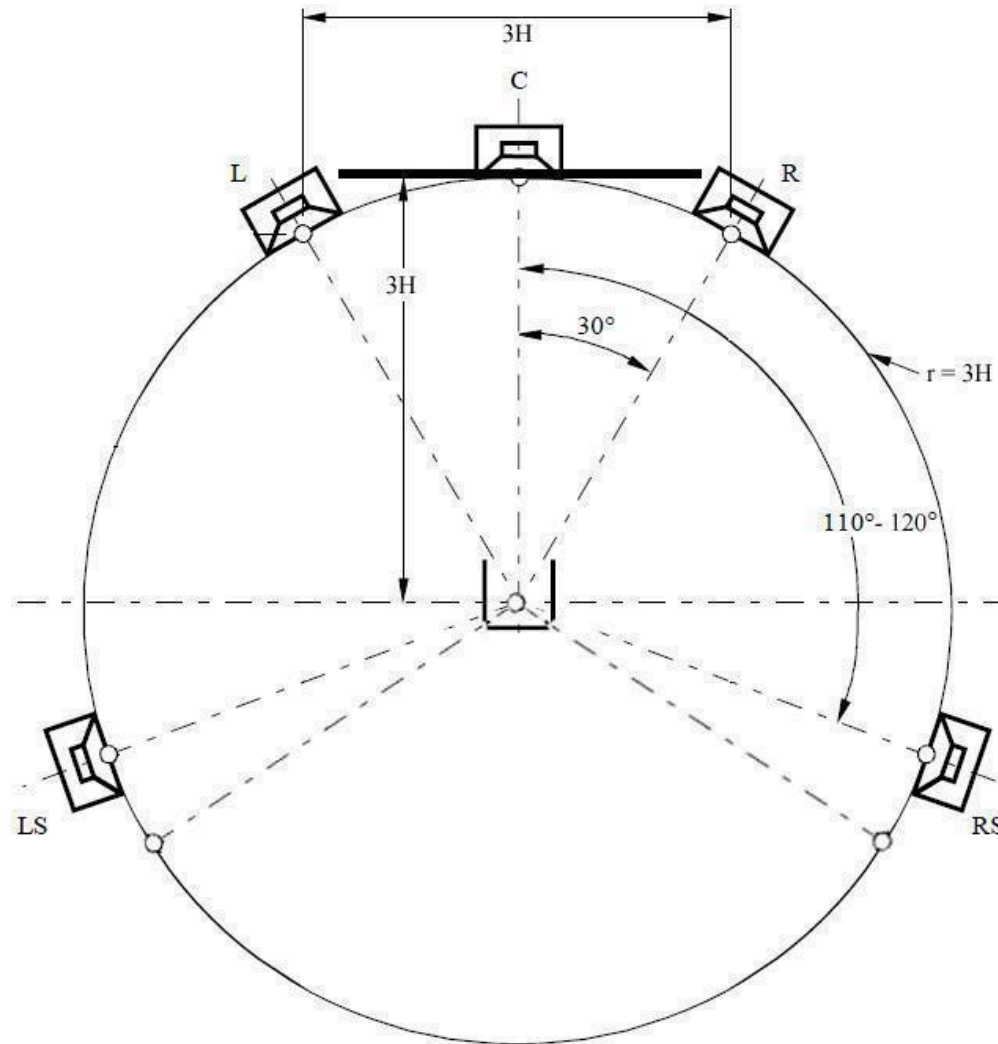
5. QC Assessment Guide

Audio Editorial Checks

Test Description	Description	Category	Fail Level	EBU Code	Required Value	Tolerance
Hum or Buzz	Background electrical noise and other interference e.g. from mobile phones	Audio	Editorial warning	0088B	Interference e.g. mains hum, cable crackle, FM radio mic and other audio interference should be repaired if at all possible. If not, the section may need to be re-recorded.	If present
Silence	Sections of silence can cause automatic alarms to activate.	Audio	Editorial warning	0077B 0078B	Silence longer than 10 seconds with pictures or 5 seconds with black or a freeze frame should be specifically noted in the QC report and to the broadcaster.	Mandatory
Unclear audio (especially dialogue)	There are many complaints about unclear dialogue – remember the audience has not seen the programme and does not have a script to read	Audio	Editorial warning	0122B	Audio should be clear and easy to hear for a first time viewer who has no access to a script or transcript.	If present
Audio background noise and unwanted audio	Background noise that is too loud relative to dialogue. This includes added effects and added music – both of which are often perceived by members of the audience to be too loud.	Audio	Technical warning	0122B	Background noise such as traffic noise etc. should not interfere with the intelligibility of the dialogue.	If present
Audio clicks	Clicks and other short "sharp" audio noises can be very distracting. Very old archive	Audio	Technical warning	0057B	Sharp, short duration audio "clicks" or "cracks" should be repaired.	If present

	audio should be cleaned whenever possible					
A/V sync (Lip Sync)	There should be no detectable Lip Sync error (mouth and speech not together).	Audio	Technical warning	0098B	AV sync should be within ±10ms.	If present
Low level audio	Audio levels, especially dialogue should not be so low that the audience needs to turn up the volume.	Audio	Technical warning	0077B	Audio level (especially dialogue) should not cause a viewer to adjust the volume during the programme.	If present
Mono (not stereo)	Audio should normally be stereo, mono is acceptable especially for archive but should never be on one channel only.	Audio	Technical warning	0124B	Dual mono audio is acceptable and is expected on archive material and often on programmes with only dialogue. New material especially music and effects should be stereo.	If present
Audio processing artefacts	Some consumer equipment (and poorly set-up broadcast equipment) can compress audio so it either becomes unclear or unpleasant to listen to.	Audio	Technical warning	0125B	The audio must not show dynamic and/or frequency response artefacts as a result of the action of noise reduction or low bit rate coding systems.	If present
Audio channel layout	Layout will depend on the audio options (e.g. 2nd language)	Audio	Mandatory	0123B	Channel layout must be as described in the Delivery document section 4.5.1.	
Phase coherence (especially surround sound)	Small timing differences between the channels can cause "phasing" or even cancellation for people listening to surround programme on stereo only TVs.	Audio	Mandatory	0012B	Surround sound should be spot-checked as a stereo down-mix to ensure there are no phasing errors, especially between the Centre and front Left and Right.	

Video Eyeball QC for the ITV Studios Global Partnerships Delivery Specification

*for native 23.98 or 29.97 content hour 01:00:00:00 timecode start is acceptable

Pre Programme						
Test Description	Description	Category	Fail Level	EBU Code	Required Value	Tolerance
AV Line-up (present at correct timecode)	Line up must start at 09:59:30:00*	Video	Mandatory	0052B	Line up MUST be as described in section 5 of Delivery Spec	
Clock correctly formatted (where used)	If a circular countdown clock is used it must be circular	Video	Mandatory	0121B	When a countdown clock is used it should be formatted as section 2.4 of the delivery document	
Clock/slate Information Correct	The clock or slate information must be correct and start at 09:59:50:00*	Video	Mandatory	0119B	Clock information MUST be as described in section 5.1 of the delivery document	
Programme Start Time	The first frame of the programme must be 10:00:00:00*	Video	Mandatory	0127B	The programme must start at 10:00:00:00*	

During the programme						
Test Description	Description	Category	Fail Level	EBU Code	Required Value	Tolerance
Blockiness (including compression artefacts)	Areas of the image especially on darker or high detail motion look like they have squares or blocks	Video	Editorial warning	0023B	There should be no visible "blocking" or edges caused by poor compression or low quality video processing.	If present

Video out of focus	Soft or blurry images	Video	Editorial warning	0050B	The point of attention should be in focus. This does not mean focus, focus pulling or having shallow depth of field cannot be used as part of the story.	If present
Captions/credits wrong	Ensure captions and credits are correct, with the correct spelling and punctuation. Also check that they actually say what you expect	Video	Editorial warning	0126B	Captions should have the correct spelling and punctuation.	Mandatory
Poor colour or grading	Images, especially skin tones should look natural and be consistent	Video	Editorial warning	0087B	Grading or Colour Correction should not be so aggressive it introduces video noise or other visible errors	If present
Text out of safe areas	Many domestic TVs still cut the edges off the picture – called "overscan".	Video	Editorial warning	0120B	Captions and text that are part of the editorial content i.e. need to be read, must be within the 16:9 caption safe areas. End credits safe will depend on the broadcasters house style.	Mandatory
Blanking errors (Video Frame Size)	Images should fill the screen. Some, especially analogue archive, can have black or coloured edges that can be distracting.	Video	Editorial warning	0015B	Image should fill the frame with no black or other colour or content visible at the edges of the frame.	If present
Black bars	Warning that images are below a given size. Includes pillar box or letter box images.	Video	Editorial warning	0015B	Images that do not fill the screen (e.g. rostrum photos) are acceptable but sequences that have varying aspect ratios should be noted.	If present
Crushed, Burnt Out or clipped Images	There should not be a loss of detail in the light or dark areas of the image	Video	Technical warning	0101B	Images should not be burnt out or crushed.	If present
Poor video up scaling (up-conversion), archive and standards conversion	Poor processing of non-HD or UHD images (when adding them to HD or UHD programmes) can cause errors and picture quality loss when compared to the original version. A converted image or sequence should not look worse that the original version	Video	Technical warning	0053B	Up converted and Standards converted shots should have no visible alias or other impairments that were not visible on the original version.	If present

Video noise	Grainy or "speckled" images. Can be caused by too much gain in the camera or pushing in grading. Grain must NOT be added to images – filters are added to transmitters to reduce blocking caused by noise	Video	Technical warning	0047B	Images should be free from video noise. Film grain should be minimised as much as possible.	If present
Aliasing	Straight edges look like they are moving or have double lines. Stills have "jagged edges"	Video	Technical warning	0148B	Images should not have visible jagged edges or visible patterning (alias) errors.	If present
Aspect Ratio Errors	The image must not look stretched or squashed	Video	Technical warning	0121B	Images should be the correct shape e.g. 4:3 should not be stretched to fill 16:9.	If present
Contouring	Colour or brightness graduations should be smooth and not appear to happen in steps	Video	Technical warning	0087B	Images should not have visible contours (steps) between different brightness levels or colours.	If present
Flash Frames (short shots)	Single frame shots can lead to accusations of "subliminal advertising" and can be disturbing. Very short shots should be avoided.	Video	Technical warning	0128B	Very short shots should be avoided. The use of 1 or 2 frames shots will need to be checked with the programme commissioner. Accidental "flash frames" must be repaired	Mandatory
Non de-interlaced stills	Stills taken from moving images can have stepped edges if they are not de-interlaced. This is covered under general image quality issues	Video	Technical warning	0038B	Stills (including stills from computer rostrum) should be de-interlaced when they are taken from sequences with movement to remove the "jagged" edges (unless shot using a progressive video format)	If present
Non-smooth motion	Juddery or jerky motion or camera movement should be avoided (Section 1.1 of the DPP delivery document)	Video	Technical warning	0087B	All movement should be relatively smooth. Movement should not "update" unless for special effect.	If present
Progressive rollers	Rollers or crawls should have smooth motion and not be too fast to read	Video	Technical warning	0087B	End credit rollers (and other moving captions) MUST be added in interlace mode to prevent judder. This does not apply to movies where the rollers speed is low enough to hide the judder	Mandatory

Ringing, hum & other artefacts	Spurious signals or artefacts, including streaking, ringing, smearing, echoes, overshoots, moiré, hum and cross-talk	Video	Technical warning	0087B	Images should not have visible video hum or ringing other visible errors. These are usually associated with analogue archive or poor compression and efforts should be made to minimise the effect.	If present
Stuck Pixels	A camera pixel that is not working causes a small square block that does not change. It can look like dust behind the lens but it is always sharp edged. This is covered under general image quality issues.	Video	Technical warning	0087B	All "stuck" pixels should be repaired, especially where they occur over moving shots	Mandatory
Transition errors	There should not normally be shot changes during transitions (mixes, wipes or other effects). This is covered under general image quality issues.	Video	Technical warning	0087B	Shot changes should not occur on either the incoming or outgoing shots of transitions (mixes, wipes video effects etc.). Transitions should have smooth motion and the incoming shot should fill the screen at the end of the transition (unless required as part of the effect).	Mandatory
End of the programme					
Lack of freeze/fade at end	Programmes must have a freeze or "living hold" to give to allow time for the transition into the next item	Video	Editorial warning	0127B	Programmes must end with a 5 seconds freeze or hold.	Mandatory

Appendix A – Document Version Control

Date	Version	Revisions
Mar 2020	V1.2	UHD specifications added.
Feb 2023	V1.3	UHD HDR specifications updated and 5 point summary added.

May 2023	V1.4	Global Distribution replaced with Global Partnership (rebranding).
Oct 2024	V1.5	P1. Inclusions of Tier 1 and 2 QC Assessment types. P3. Updating specification link to https://www.itv.com/commissioning/articles/itvs-globalpartnerships-guidelines