DELIVERY OF IPU CONTENT TO RTÉ

Version 1 – March 20th 2026

INTRODUCTION

RTÉ, as an organisation, strives for an industry best practice media supply chain and content delivery process. It is in the interest of both RTÉ and the independent production sector that the delivery and subsequent transmission of completed programmes occur as smoothly and efficiently as possible. There is a shared responsibility between all stakeholders to ensure that this is the case. In addition to pre-arranged editorial and stylistic requirements, RTÉ has standard delivery, transmission, and technical requirements for all programmes. These are designed to ensure that programmes are publicised in advance, and are broadcast at the correct time, without technical problems, and that no legal or copyright problems occur in either pre- or post- transmission. They may also facilitate subsequent exploitation of programmes by way of distribution, overseas sales etc. with the minimum difficulties. To minimise business risk and maximise the quality of our services and output, all stakeholders should ensure that they are fully aware of, and adhere to, the principles and processes that underpin RTÉ's media supply chain all of which are outlined in the following document. The information provided here is intended to outline the requirements for all programme makers and suppliers producing and delivering independently commissioned content to RTÉ.

The document serves as a full and complete guide to RTÉ's video and audio technical and transmission specifications and information about how the independent production is initially file onboarding to ensure that these specifications are met. This document will provide clarity around RTÉ content delivery policy including file specifications, delivery systems, core principles, delivery timelines, and our policy around exceptions for late deliveries or redelivery requests. Independent programme makers and suppliers should not proceed with Master delivery to RTÉ without first reading the information contained within this section. This document will be updated as knowledge, technology, and standards evolve. Please ensure as a Commissioning Editor, Programme Maker, or Post-House/Supplier you are familiar with technical and delivery requirements and policies contained within this "onboarding dossier."

If you have any queries about any of the information contained in this document, please contact fileonboarding@rte.ie

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RTÉ GLOSSARY – DEFINITIONS, SYSTEMS AND STAKEHOLDERS

RTÉ Content Delivery Definition

In the context of this document, Content Delivery refers to all complete TV master programmes (edited / prerecorded) commissioned from the independent sector that are delivered to RTÉ's Content Management systems for playout/publishing on all RTÉ platforms and subsequent archiving.
In the context of this document, Live Programming delivery refers to all Independent Produced Programming "live programming" that is produced outside of RTÉ Studios and is transmitted "live" on any RTÉ platform. Key systems and stakeholders in the RTÉ Media Supply Chain are outlined below:

RTÉ Content Delivery Applications and Systems

Mediagenix What's On (WON): RTÉ Channel Management system that houses the contract information and planned scheduling details for linear and non-linear transmissions. A programme cannot be delivered to RTÉ without a contract being entered into What's On.

TMD Mediaflex (FAST): RTÉ Broadcast Asset Management system that stores all video assets for transmission and publication on RTÉ Linear, RTE Non-Linear and 3rd Party platforms.

One Media Share (OMS/Galaxy): RTÉ Digital Content Management System (MAM) for all RTE content including video and audio archives. Thie implementation of this system means that there is no longer a requirement for IPU programme suppliers to separately deliver a physical XDCAM/HDCAM archive copy. The programme file delivered for transmission will be stored here- a single file copy for broadcast and archive.

Aspera: This is the file delivery system RTÉ requires IPU programme makers to use when delivering long-form content to RTÉ. There is a single "Shared Inbox" for all IPU delivery.

Interra Baton- This is the Technical Quality Control tool that RTÉ uses to ensure all delivered IPU files adhere to RTÉ technical standards. This Tech QC tool will be rolled out as part of the One Media Share deployment.

RTÉ Content Delivery Stakeholder Teams

Scheduling: responsible for organising and managing the schedule for RTÉ channels, ensuring that all programmes, commercials/sponsorship, promos, continuity, and other content are aired at the right times, in the correct order, and without errors. They ensure the schedule adheres to broadcasting and commercial rules and regulations, adjusting schedules to accommodate live events, breaking news, or changes in programming.

Media Management: point of contact for delivery of programme files to RTÉ. The team facilitates the onboarding of Suppliers and ensures programme deliveries are compliant with RTÉ technical specifications.

The Content Delivery Planner, part of the Media Management team, is tasked with tracking and managing efficient delivery of all content for playout/publishing on all RTÉ platforms.

Programme Compliance Team: responsible for ensuring that acquired and commissioned RTÉ content complies with legal, regulatory, and editorial standards before it is broadcast or published. They make sure that programmes adhere to broadcasting regulations, RTÉ editorial policies, and relevant laws, including content that deals with sensitive subjects, offensive material, or potentially harmful content. Their work is crucial in protecting RTÉ from legal issues, upholding viewer standards, and ensuring fair and balanced content.

Access Services Team: responsible for ensuring that television and on-demand content is accessible to as many people as possible, especially viewers who are deaf, hard of hearing, blind, or visually impaired. They provide services that make TV programming inclusive by adding accessibility features to broadcasts, including subtitles, Irish Sign Language (ISL), and Audio Description (AD). The Access Services team also ensures that the broadcaster complies with accessibility regulations, as set by Coimisiún na Meán.

Playout Team: responsible for ensuring that television content is broadcast seamlessly to viewers. Their role involves the technical operation and monitoring of the transmission of TV channels, ensuring that all programmes, commercials, promos, and other content are aired at the correct times and in the correct order. They ensure real-time monitoring, resolve issues, and make quick decisions during live broadcasts to maintain a seamless viewer experience.

RTÉ Player Video Product Team: Responsible for delivering on RTÉ Player streaming through management of player rights, content acquisition and RTÉ Player Originals. The team oversees product editorial like Key Art, imagery, descriptions and metadata and curation for optimal discovery across all owned and operated platforms.

RTÉ Player User Success Team: Are a customer experience team responsible for delivering a seamless RTÉ Player streaming experience through monitoring all channels and carrying out live and VOD product quality assurance checks across device, live and on demand streaming QA, responding to customer feedback and updating FAQs

SECTION 1: RTÉ PROGRAMME REQUIREMENTS

1.See Appendix 3

See Appendix 3 for full details on all RTÉ programme video and audio technical and general quality requirements.

SECTION 2: RTÉ FILE DELIVERY REQUIREMENTS

1. ONBOARDING INDEPENDENT SECTOR FOR DELIVERING CONTENT TO RTÉ

RTÉ has the following policy and procedures for all IPU content delivery. Before delivery of programmes to RTÉ, suppliers should familiarise themselves with RTÉ Content Delivery policy.

1.1 RTE File Delivery overview

- All programme suppliers must be "onboarded" to RTÉ content delivery workflows, technical standards and policies a minimum of 30 days in advance of programme delivery.
- All programme files must be delivered in HD adhering to RTÉ technical specifications, RTE cannot accept SD files.
- All programme files must be delivered using the RTÉ file delivery system. Suppliers will be given access to this system at onboarding. RTE cannot accept file delivery through other 3rd party systems. RTÉ will not download content from 3rd party sites/platforms.
- All IPU productions will need a pre-assigned Media ID before delivering a file to RTÉ. This pre-assigned Media ID will be provided by the RTÉ Media Management teams after the programme is contracted and in advance of delivery.
- All programme file deliveries must be named with the pre-assigned Media ID.
- RTÉ provides a pre-delivery checklist to aid suppliers
- All programme files should be viewed and verified prior to delivery to RTÉ.
- All suppliers should complete the IPU Content Delivery form when delivering files.

1.2 RTÉ File Onboarding

RTÉ expects that all Independent Production Commissions will be delivered to RTÉ as a file, and RTÉ will not "download" from 3rd Party/Supplier systems. RTÉ cannot accept delivery of IPU programmes in SD or non RTÉ HD file standards or through other non RTE prescribed 3rd party delivery systems.

RTÉ contracts specify that all external content providers must be 'file onboarded' before they can deliver master programmes to RTÉ for the first time. The "file onboarding" process must be completed no less than 30 days in advance of the programmes scheduled transmission date. Suppliers are instructed to begin this process by complete the File Onboarding Form
[RTÉ VIDEO FILE ONBOARDING FORM – Fill out form](#) or by emailing fileonboardingdl@rte.ie.
The RTÉ HD file standard and associated technical specification documentation
will be sent to the supplier along with details about how to access and use RTÉ's preferred file delivery system- Aspera. The Supplier will be asked to deliver a test file. RTÉ will confirm if this file meets the RTÉ "HD" file standard and other onboarding requirements and if so, the Supplier can proceed to deliver programmes to RTÉ. Full details about RTÉ File Onboarding for IPU can be found in Appendix 1.

1.3 RTÉ File Delivery System

RTÉ uses the ASPERA FASPEX system for file delivery of all IPU content to RTÉ. As part of the onboarding process RTÉ will invite a supplier, via an email sent from RTÉ FAPEX Delivery, to access the RTÉ IPU Shared Inbox. In this email, there will be a link to access the Shared IPU inbox. The RTÉ ASPERA IPU Shared Inbox will be used for all file deliveries from the supplier. Upon agreement with

relevant RTÉ stakeholder teams, ASPERA can also be used to deliver other associated programme assets. Full details on how to access and use ASPERA in Section 3.2 below.

1.4 RTÉ HD Video File Specifications
All IPU programmes must be delivered to the below technical specifications

	VIDEO
File Type	MXF
File Format	OP1-a
File Format Profile	Closed/Complete
Video Compression	MPEG-2 LONG GOP
GOP Format	Fixed, M=3 N=12
Colour space	*4:2:2*
Commercial Name	XDCAM HD 422-50
Resolution	1920 x 1080
Video bit rate	50Mbps 8bit
Interlaced	Yes
Field Dominance	Upper Field First – Field 1
Timecode standard	MXF Timecode Track
Programme Start	10:00:00:00
Aspect Ratio	16:9 FHA
Frame Rate	50i i.e. 25 FPS interlaced or 50 interlaced fields per second
Time code standard	MXF Timecode Track
Access Services	RTÉ broadcasts closed caption subtitles in EBU. stl format. For English Subtitles of Foreign Language Programmes, subtitles should be burnt-in onscreen against a veiled background Arial regular font size 58 (Pixels). Follow guidelines provided by EBU – Recommendation R 123 "EBU Audio. Track Allocation for File Exchange. AD tracks are embedded in the. mxf broadcast file on tracks 5 and 6. Tracks should contain the full programme audio premixed with AD track.

	AUDIO
General	General Audio should be in stereo, if mono is supplied, ideally recorded on Track 1 and Track 2 (phase compatible).
Audio Stream	1 Stream up to a max of 8 tracks
Audio Tracks	Track 1 and 2: Audio Track 3 and 4 (optional): Music and Effects or Dolby E Track 5 and 6 (optional): Audio Description {AD Tracks premixed with programme audio}
Audio Spec	Codec: PCM uncompressed Wrapped: BWF (Broadcast wav) 8 tracks, 24 Bit resolution . Sample frequency: 48kHz
Audio Levels	Follow EBU Recommendation R 128 Guidelines, "Loudness normalisation & permitted maximum level of audio signals"

1.4.1 - GOP and Audio Specifications

RTÉ asks suppliers to pay specific attention to the following specifications:

- GOP FIXED Format
- 24 Audio Bit Resolution
- BWF Audio Wrapper
- 48kHz Sample Frequency

Deviations from these specifications will result in a Technical QC failure and a re-onboarding redelivery request. If the file satisfies RTÉ technical requirements, then the supplier will normally not be asked to "file onboard" again. However, RTE retains the right to ask suppliers to re-onboard in certain circumstances e.g. if there is a time lapse between supply, a change of RTÉ file or broadcast format, or if subsequent file deliveries fail the RTÉ QC process.

1.5 RTÉ IPU Content Delivery – RTÉ ONE MEDIA SHARE Delivery Workflow

Once the supplier has passed the file onboarding stage, they can then proceed to deliver files to RTÉ. From March 2026, the RTÉ One Media Share Digital Content Management (MAM) system will streamline delivery of IPU content as a HDCAM copy will no longer be required. As part of the One Media Share system rollout, several other workflow changes will be implemented.

1.5.1 Media ID supplied by RTÉ

When a programme is contracted in RTÉ's Channel Management system (What's ON), programme suppliers will be sent a list of pre-assigned Media ID/Placeholders by RTÉ Media Management for each episode and series they are contracted to deliver.   This list of pre-assigned and unique Media IDs should be supplied to the facility/post-house uploading the programme to RTÉ.

1.5.2 Media ID protocol

This Media ID/ Placeholder name is unique for each programme and can only be used once. The Media ID/Placeholder will follow a common protocol - MI followed by a 9- digit number SAMPLE MI000011111. The Media ID should be used as the file name when delivering programmes to RTÉ.

1.5.3 Content Delivery Submission Form

Suppliers / post houses will be asked to complete the RTÉ Content Delivery Submission form when delivering files to RTÉ.

1.6 RTÉ Content Delivery – RTÉ Unique File Name, Clock ID and Programme Title

The RTE UNIQUE File Name structure is as follows: MI followed by a unique 9-digit numeric code as generated by the RTÉ Schedule Management system What's On. This will be supplied by RTÉ to the supplier and should be used as the FILE NAME that is sent to RTÉ.

1.6.1 Unique File Name structure

	File Name	
Media ID	MIxxxxxxxxxxxx.mxf e.g. MI000001234	

1.6.2 Clock Identifier

	Media ID and Programme Title Abbreviation	
Clock & programme Identification- Media ID_ Programme Title Abbreviation	An alignment/identification leader must precede the programme recording. This should consist of: Bars and Tone, Minimum of ten seconds of countdown clock with tone for first 5 seconds. The clock should be circular format when viewed in 16:9 to allow positive identification of the programme format. The following should be included on the leader - Media ID- placeholder name as provided by RTÉ followed by abbreviation of programme Title name (outlined below) e.g. MI000001234_RTISER1EP1	

The clock should contain no personal identification information. When uploading the file through RTÉ Aspera File Delivery System, the following naming convention should apply in the ASPERA TITLE FEED ONLY. The file name should be the MI number (MI followed by the 9-digit number).

1.6.3 Programme Title Aspera

PROGRAMME NAME – TITLE FIELD IN ASPERA	
Field required	RTÉ standard (where applicable)
Supplier name	3 letter acronyms of Supplier name
Post House name	3 letter acronyms of post house name
Series name	4 letter acronyms
Series number	Number
Episode number	Number preceded by 'e' followed by underscore
Placeholder/Media ID	RTE Media ID
EXAMPLE	SUPPHOSERI1E1_MI000012345

1.7 RTÉ Content Delivery Form

As part of the One Media Share system roll-out, all IPU programme file suppliers (post-production houses) will now be asked to complete a Content Delivery Form when delivering a file to RTÉ.

INDEPENDENT PRODUCTION CONTENT SUBMISSION FORM – Fill out form

This form captures key data for content delivery reporting and is mandatory. RTÉ Content Delivery Policy including delivery deadlines, and the Pre-Delivery Checklist are included on the Content Delivery Form. Programme makers should ensure their Post House has all the necessary information required to fill in this form.

2. RTÉ CONTENT DELIVERY POLICY

2.1 Programme Delivery Date and Delivery deadlines

The Programme Delivery Date is defined in the Contract between RTÉ and Supplier and all RTÉ contracts state that programmes must be delivered to the contracted Delivery Date or no later than 7 days in advance of programme transmission date. Late programme deliveries, defined as those delivered (or redelivered) within 7 days of transmission heighten risk for RTÉ and impact stakeholder teams, increase inefficiency, hinder automated media supply chain workflows, strategic planning, and limit future growth.

RTE Programme Delivery and Deadline policy outlined below:

- The Programme Delivery Date is defined in the contract between RTÉ and the Supplier. The Programme should be delivered to RTÉ by this date or no later than 7 business days before Transmission Date.
- Programmes that do not deliver to agreed timelines are defined as a risk. In cases of exceptions to RTÉ delivery deadlines, these must be agreed in advance with all stakeholders. All requests for exceptions to contracted delivery dates and deadlines must be submitted through the RTÉ Late Delivery Form CONTENT LATE DELIVERY & REDELIVERY REQUEST FORM – Fill out form where they will go through an internal approval process.
- At times of peak supply (e.g. Christmas), RTÉ will implement a specific delivery deadline date for all programmes scheduled to transmit over this period. This will be included in contracts and communicated by all stakeholders as early as possible. For reference the deadline date is normally December 10th.
- Series drops and box sets for linear and non-linear require longer lead in times than 7 days. The delivery deadline(s) for these should be communicated to all stakeholders at the contract stage.

2.2 Programme Redelivery Policy

Redeliveries cause significant inefficiencies, heighten risk, and cause significant impacts across 3rd party platforms. Redelivery policy outlined below:

- RTÉ does not accept programme redeliveries unless in exceptional circumstances.
- In cases of exceptions , redelivery requests must be submitted in advance via the RTÉ Redelivery Form. CONTENT LATE DELIVERY & REDELIVERY REQUEST FORM – Fill out form
- All redelivery requests resulting from editorial, legal, or commercial issues will need to be approved by relevant senior RTÉ stakeholders.
- Files can only be redelivered if they have been approved by the relevant stakeholders and supplied with a new Media ID by Media Management.

2.3 Exceptions to RTÉ Policy

Exceptions to the above will all be strictly managed on a case-by-case basis. Where requests for either late delivery or redelivery are rejected, as they do not fit exceptional criteria, then this decision is final. A full list of exceptions to this policy is outlined in Appendix 2.

2.3.1 RTE Service levels for exceptions

While RTÉ operational teams will always endeavour to provide the full range of services on all RTE content, it may not be possible to apply the full range of services to programmes that are managed as exceptions especially programmes that are delivered close to or on transmission dates.

3. RTÉ PROGRAMME DELIVERY

Once initial file onboarding is complete, suppliers can move to the file delivery stage. Suppliers should always closely observe the following requirements before delivering master files and secondary materials and contracted deliverables.

3.1 Programme Delivery Pre-Checks

All Master files must be assessed by the production company prior to delivery to RTÉ to ensure programmes and files meet full editorial, technical and metadata standards. Suppliers should only proceed with delivery after first ensuring requirements on the file delivery check list have been fulfilled. This checklist is designed to eliminate any requests for redelivery.

3.1.1 Initial File Onboarding Complete for First time Supplier

- Aspera/Delivery Platform Accessed
- Test file matching RTÉ HD specification sent
- QC confirmation received from RTÉ - Onboarding complete
- Suppliers always adhere to these specifications for all future deliveries.

3.1.2 Media ID/Placeholder

- Supplier has received appropriate episode placeholder/Media ID from RTÉ.

3.1.3 On Screen Text/Copy

- Clock information corresponds to correct file and includes no personal identification
- Time code has been removed from Master file
- Programme title cards correspond to correct programme file
- On screen 'Supers', text/copy, and credits cross-checked
- End board (RTÉ, Production House and/or Funding Bodies) displayed correctly

3.1.4 Clearance

- Clearance secured on any/all branding and archival footage used in programme
- Archive quality meets RTÉ requirements

3.1.5 File and Programme/Title Names

- File name directly corresponds to the correct media assigned to it
- File name is MI followed by 9 digits only.
- Title Name in Aspera corresponds to Programme Name_Media ID
- Programme Name adheres to RTÉ abbreviation convention

3.2. Programme File delivery
### 3.2.1 Overview of content delivery process

RTÉ Content Delivery policy and contracts state the agreed delivery date for all programmes and that programmes should be delivered to this date or no later than a minimum of 7 days in advance of transmission. It is essential that all suppliers adhere to the RTÉ content delivery policy. The content delivery lead time is necessary to minimise risk to RTÉ output and essential in providing RTÉ operational teams with the appropriate time to carry out file import, technical quality control, compliance, access service file creation, and any other essential pre-transmission processes. For peak production periods e.g. Christmas and Easter, RTÉ will require delivery of content earlier than 7 business days in advance. RTÉ will implement specific delivery deadline dates outside of the normal 7-day rule and notify programme makers of the same via email and/or Hub publishing. Series drops and box sets will require additional lead in time than 7 days. This will need to be agreed with Media Management on a case-by-case basis at the contract stage. RTÉ's Media Management team oversees and are responsible for the delivery and acceptance of all programme files, ensuring content has been delivered in compliance with the required technical specifications and file delivery policies. As part of the RTE One Media Share project, the IPU production will be provided with a Media ID/Placeholder for each series/episode/title in advance and must attach the Master Programme to the assigned Media ID/Placeholder AS THE FILE NAME and deliver the file to RTÉ using the Aspera Delivery system as prescribed at file onboarding.

3.2.2 Upload and delivery process
File should be uploaded to the RTÉ IPU Aspera FASPEX SHARED INBOX – IPU LONGFORM DELIVERY. If a supplier has issues connecting to the RTÉ Aspera, please notify RTÉ as soon as possible. When submitting files, the Supplier must ensure all information inputted into Aspera is accurate. The Title Field should be completed correctly, following the convention Programme Abbreviation_Programme MediaID
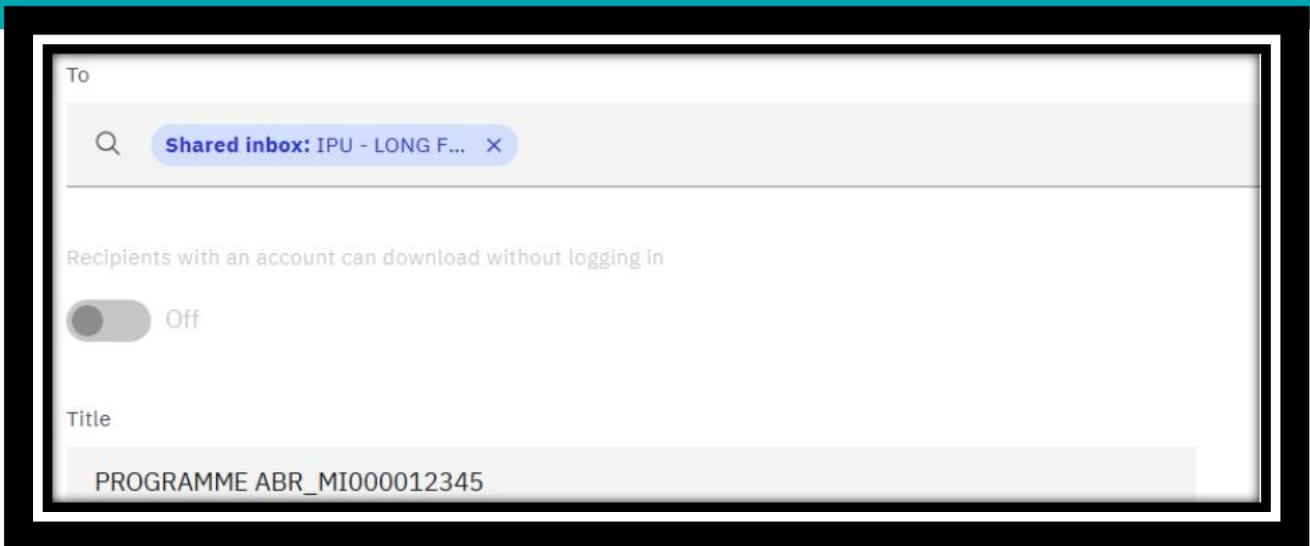
If uploading a single file, the supplier selects ADD FILE
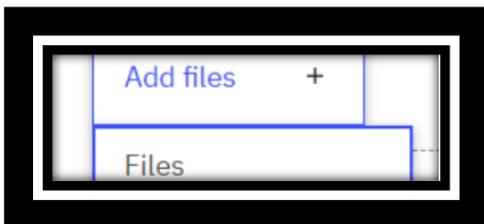
The supplier must ensure that the File Name/Media ID of the file they are uploading is correct –that it adheres to RTÉ file Media ID convention and directly corresponds to the pre-assigned Media ID. The File Name directly corresponds with what is entered on Submission Form.
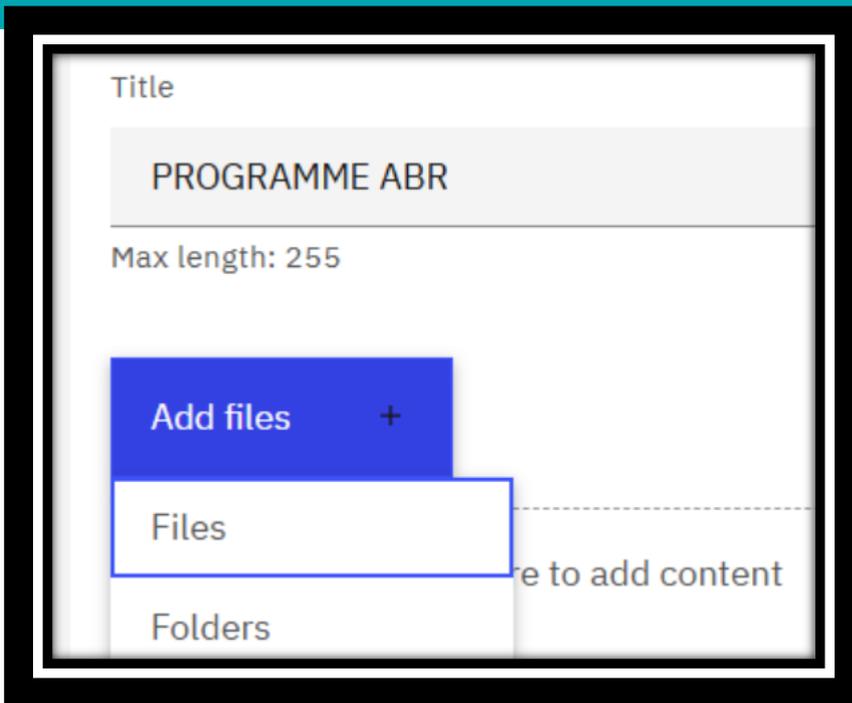
When ready to send the supplier should fill in all information correctly, attach the
file and select the SEND button to upload to RTÉ. The Supplier can monitor the transfer process through the Transfer Activity tool. If/when sending folders/multiple files at once the supplier should ensure the parent folder Name matches the programme Abbreviation.

3.2.3 Communications Process

When sending programme files to RTÉ, the CONTENT DELIVERY FORM must be completed.

INDEPENDENT PRODUCTION CONTENT SUBMISSION FORM – Fill out form

Submission of this form will trigger an email notification to RTÉ. Information submitted in the Form will identify the programme file name (media id). If the file is successfully delivered and passes the internal RTÉ technical quality control process, this will be communicated to the supplier. If the file is not successfully imported or fails the RTÉ quality control and compliance processes, this will be communicated to the supplier and a redelivery requested at no extra cost to RTÉ.

3.2.4 Technical QC and Editorial Compliance

After a file is delivered to RTÉ it will be interrogated using RTÉ's TECHNICAL QC Application. If this Technical QC is successful, then the file will be automatically imported into the RTÉ MAM system and exported to the RTÉ Broadcast Asset Management system. The file will then undergo a full editorial compliance process. If the file "fails" the Technical QC process, it will be rejected, and a replacement copy will be requested at no additional expense to RTÉ. RTÉ will provide a full technical QC report to supplier in instances of technical QC failure. If the programme fails the Editorial QC, then a replacement delivery will be requested.

3.2.5 Redelivery

In cases of either technical or editorial QC failure, RTÉ will contact the supplier and provide a NEW MEDIA ID to deliver the revised version. The supplier should NEVER send a revised version to an "old" Media ID/Placeholder.

3.2.6 Delivery Process Final Summary

The key points to note are

- ✓ HD File with Correct Media ID is uploaded via Aspera
- ✓ Content Delivery Form Completed and Submitted.
- ✓ Communication received from RTÉ that file has been delivered and QC passed.
- ✓ Additional access services and publicity materials supplied.
- ✓ Programme delivered to contracted date or a min. of 7 days in advance of transmission.
- ✓ Late and Redeliveries must be agreed in advance with RTÉ. Redeliveries require a new Media ID.

4. DELIVERY OF LIVE IPU PROGRAMMES

4.1 - Booking process, technology, and connectivity

For delivery of live programme events external to RTÉ studios the programme maker should contact linesdl@rte.ie to place a request for all circuit requirements for the broadcast of their programme. A minimum of one weeks' notice should be provided for RTÉ to ensure all circuit requirements can be met. Circuit requirements should be identified and agreed, as well as start and end time provided – allowing for line up time and potential overrun time. Precise location details should be provided also. Production personnel contact details should also be exchanged for the benefit of the RTÉ MCR team. RTÉ currently accept "live" programme delivery via two standard methods – KU Satellite, and Dedicated Peer to Peer Fibre Connectivity. RTÉ can also support delivery of programme signals via KA, Live U and IP streaming protocols such as SRT provided sufficient dedicated bandwidth is provided by the supplier/venue.

In cases where IPU programme suppliers can provide their own connectivity, then details of this should be shared with the RTÉ Lines team in advance. Where IPU programmes are provided their own circuits (e.g. KU satellite segment) RTÉ requires circuit booking information to be with RTÉ teams a minimum of 2 working days in advance transmission date.

SECTION 3: OTHER DELIVERABLES

1. ACCESS SERVICES
1.1 Overview
RTÉ is committed to providing Access Services to enhance the enjoyment of content for people who are Deaf, hard of hearing, Blind or vision impaired, and is regulated by Coimisiún Na Meán in doing so, in accordance with their annual mandated quota.

Where it is pertinent, supporting access services media should be provided by Supplier. Where this is not possible, Access Services within RTÉ will create necessary files to accompany the programme Master file. In cases where Supplier is delivering these access service files, it is the responsibility of the Commissioned Production company to ensure files (STL, AD, ISL) meet RTÉ's technical and editorial guidelines. To assist subtitle creation: Script, List of contributors and running order sent to subtitle@rte.ie at the time of Master file delivery (unless requested in advance of final delivery). For queries about **Sound and Vision** funded projects please contact accessqueries@rte.ie. For further information on all other Access Service requirements and guidelines, please contact subtitle@rte.ie.

1.2 Technical details
RTÉ broadcasts closed caption subtitles in EBU.stl format. For English Subtitles of Foreign Language Programmes, subtitles should be burnt-in onscreen against a veiled background. Arial regular font size 58 (Pixels). If no subtitles are available, please provide a script to aid in the subtitling process. AD tracks are embedded in the .mxf broadcast file on tracks 5 and 6. Tracks should contain the full programme audio premixed with AD tracks.

1.3 Delivery Details
To enable RTÉ to deliver essential accessibility features it is essential that Suppliers observe the 7-business day content delivery lead time when delivering access services files. For IPU subtitles can be sent via the RTÉ IPU Shared Aspera or email to subtitle@rte.ie

2. ARCHIVES
2.1 HDCAM tape
A physical XDCAM disc or HDCAM tape copy is no longer a delivery requirement for RTÉ Archives. The file delivered for broadcast (XDCAM HD 422 50) will be used as the Archive copy and will be stored in the One Media Share system post transmission.

3. OTHER DELIVERABLES
3.1 More information to follow on marketing and product delivery requirements

APPENDIX 1: RTÉ IPU FILE DELIVERY ONBOARDING

1.Definition and Overview of File Onboarding process

"File Onboarding" typically refers to the process of introducing and integrating new files into a system, workflow, or platform in a structured way. For RTÉ the file onboarding process ensures that

- Video files can be delivered to RTÉ via the RTÉ file delivery system.
- Video files always adhere to RTÉ technical specifications.
- Video files are validated for use in RTÉ content management systems.

The process ensures that suppliers of video files are compliant with RTÉ content delivery standards, processes, workflow, and policy. At contract stage, RTÉ specifies that new suppliers must be file onboarded before they can deliver programmes to RTÉ. Suppliers are invited to fill out the RTE File Onboarding Form RTÉ VIDEO FILE ONBOARDING FORM – Fill out form or email fileonboarding@rte.ie to begin this process a minimum of 6 weeks or 30 days before the first transmission date. This timeframe enables RTÉ teams with sufficient time to establish that the supplier can deliver to RTÉ standards. Suppliers will be contacted by the team responsible for file onboarding – they will be supplied details on how to access RTÉ file delivery platform and supplied with technical specifications for RTÉ HD video broadcast file format (XDCAM HD 422 50). Suppliers will be invited to submit a test file. If the onboarding is successful, the supplier will be instructed in the process of delivering files on an ongoing basis.

1.1 First Time File Delivery

RTÉ uses Aspera Faspex for Independent Production File Delivery and has created a dedicated Shared Inbox for uploading files. RTÉ does not accept file delivery via any other system and will not download files from 3rd party suppliers. At file onboarding, the supplier will be sent an invite/link to join the RTÉ Aspera Account dedicated to IPU Long Form Programme delivery. The supplier accesses the Shared Inbox through the link in the email. Suppliers will not need to download any dedicated software to use this system, but they can install the Aspera Connect software if they wish.

1.1.1 Sending a test file to RTÉ

RTÉ will provide the supplier with a Media ID to deliver the test file. This Media ID should be used as the FILE NAME for the test. To send the file, the supplier must Log into Aspera account via the supplied link. Click Send Files. In the "To" Field – enter IPU Long Form Programmes

Click add files and select file – It is also possible to upload single or multiple files in a folder. If uploading in a folder, ensure its name matches the Title Field.
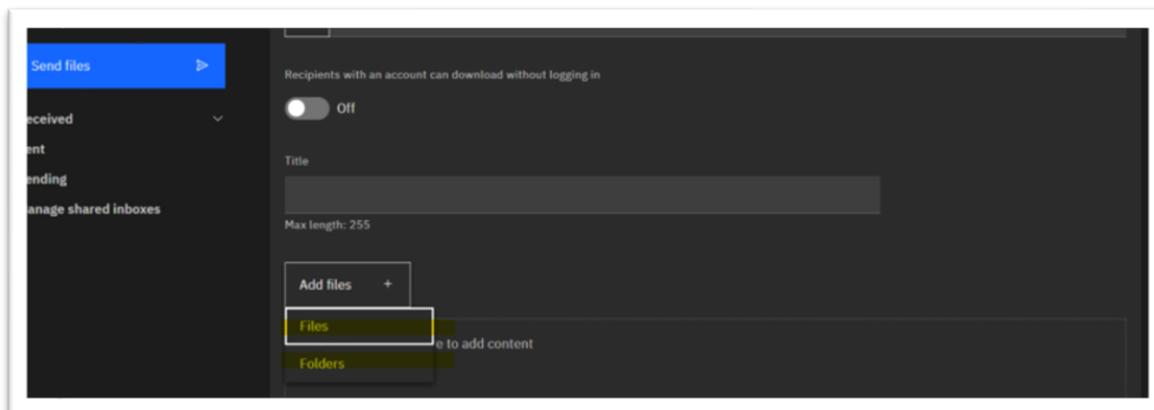
Title Name in Aspera- The file name should correspond with the Media ID supplied by RTÉ for file onboarding. In Title Field – enter the name matching RTÉ requirements outlined at file onboarding which is the Media ID followed by an abbreviation clearly identifying Supplier / Programme being onboarded.
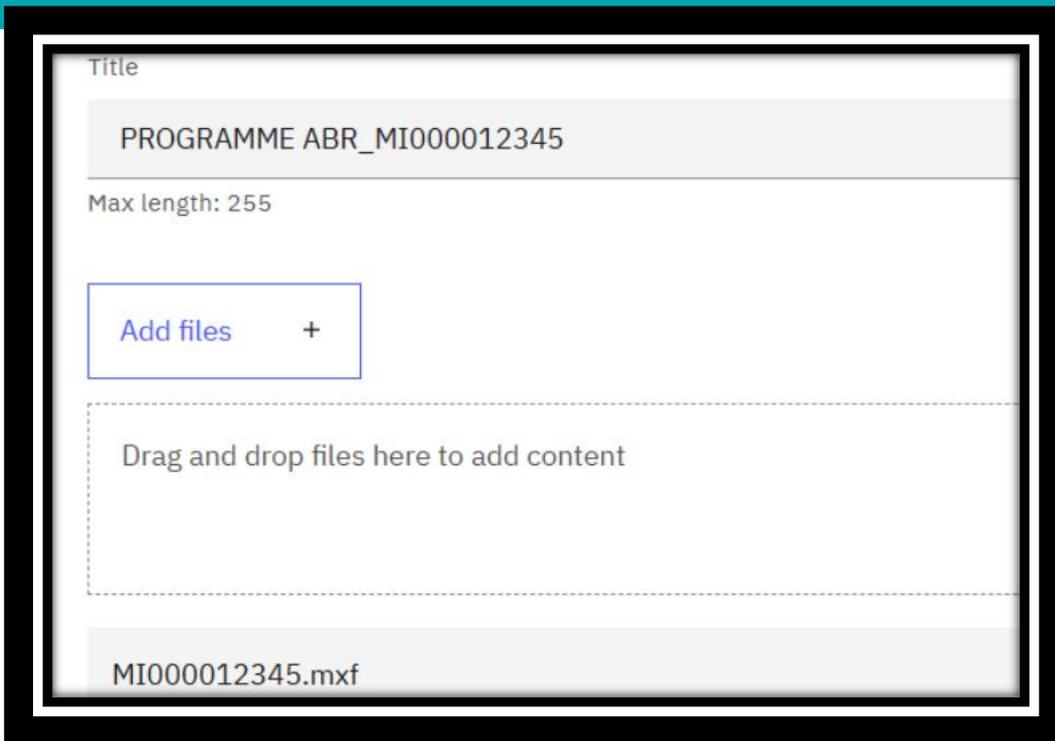
1.3 RTÉ Video File HD Technical Specifications
Programme Identifier Clock
A programme identifier clock must be present on all file deliveries to RTÉ.

Clock	RTÉ Preferred HD File standard (TX copy)
Clock and programme Identification	An alignment/identification leader must precede the programme recording. This should consist of: • Bars and Tone and 30 seconds of countdown clock and tone, min.10 seconds of countdown clock with tone for first 5 seconds. The clock should be circular format when viewed in 16:9. The following should be included on the leader • Media ID- placeholder name as provided by RTÉ Series No, Name Programme Name/Episode Title/Number • Aspect Ratio and Audio Track Allocation and Access Services present.

With rollout of RTE One Media Share suppliers will no longer supply content with a unique filename based on the programme supplier/series/episode, instead a media id/placeholder will be provided by RTÉ for the supplier to deliver. This will be in the form of a unique MI Number. This Media ID should be included on the Programme Clock. The clock must not contain any personal identification information.

1.3.1 RTÉ HD File Format

Suppliers must ensure that they are delivering their files matching RTÉ 's exact HD file specification. RTÉ asks suppliers to adhere to outlined specifications including video and audio codecs and wrappers, GOP structures, audio layout, and audio bit depth. The RTÉ "HD House Standard" is commercially known as XDCAM HD 422-50 and the specifications are detailed fully below,

Video File Specifications

Video	HD VIDEO FILE FORMAT AND SPECIFICATION
File Type	MXF
File Format	OP1-a
File Format Profile	Closed/Complete
Video Compression	MPEG-2 LONG GOP
GOP Format	Fixed, M=3 N=12
Colourspace	*4:2:2*
Commercial Name	XDCAM HD 422-50
Resolution	1920 x 1080
Video bit rate	50Mbps 8bit
Interlaced	Yes
Field Dominance	Upper Field First – Field 1
Timecode standard	MXF Timecode Track
Programme Start	10:00:00:00
Preferred Aspect Ratio	16:9 FHA
Frame Rate	50i i.e. 25 frames per sec interlaced or 50 interlaced fields per sec.
Time code standard	MXF Timecode Track
Access Services	RTÉ broadcasts closed caption subtitles in EBU .stl format. For English Subtitles of Foreign Language Programmes, subtitles should be burnt-in onscreen against a veiled background. Arial regular font size 58 (Pixels). Follow guidelines provided by EBU – Recommendation R 123 "EBU Audio. Track Allocation for File Exchange. If no subtitles available, please provide a script to aid the subtitling process. AD tracks are embedded in the .mxf broadcast file on tracks 5 and 6. Tracks should contain the full programme audio premixed with AD tracks.

Audio	RTÉ Audio Configuration HD Standard
General	General Audio should be in stereo, if mono is supplied, ideally recorded on Track 1 and Track 2 (phase compatible).
Audio Stream	1 Stream with a minimum of 6 tracks up to a max of 8 tracks
Audio Tracks	Track 1 and 2: Audio, track 3 and 4 (optional): Music and Effects or Dolby E, track 5 and 6 (optional): Audio Description (AD Tracks premixed with programme audio).
Audio Spec	Codec: PCM uncompressed. Wrapped: BWF (Broadcast wav), 8 tracks, 24 Bit resolution, Sample frequency: 48kHz
Audio Levels	Follow EBU Recommendation R 128 guidelines, "Loudness normalisation and permitted maximum level of audio signals"

APPENDIX 2: RTÉ CONTENT DELIVERY POLICY EXCEPTIONS

1-Programme File Late Delivery

Content delivered within 7 business days of transmission date is defined as a risk and must be minimised. RTÉ accepts some content may require delivery close to transmission dates and times due to topicality however these must be strictly the exception. As well as impacting linear output, and operational areas such as Platform Scheduling, Media Management, Platform Services and Platform Control, late deliveries also impact RTÉ Player and 3rd party platforms.

1.1 Impacts of Late Deliveries on Platform Services

Late deliveries have a significant impact on Access Services. If Suppliers are delivering programme files within 7 business days of scheduled transmission, it is essential subtitle@rte.ie are notified so that they can prepare accordingly. If programme files are delivered late, it may not be possible to create accessibility files, and the programme may require live subtitling or may be transmitted without any subtitles. This impacts the overall quality and accessibility of the programme.

1.2 Exceptions to RTÉ Delivery

If meeting the contracted delivery date or the 7-day pre transmission date deadline is not possible due to topicality or editorial reasons, an exception should be requested as early as possible. All late deliveries, defined within 7 days of transmission on RTÉ /publishing to RTE Player, must be agreed on a case-by-case basis between the production and RTÉ operational teams. Requests for a late delivery must be submitted through the Late Delivery Request FORM.

 CONTENT LATE DELIVERY & REDELIVERY REQUEST FORM – Fill out form

The request will then go through an internal approval process. If the exception is agreed with relevant stakeholders, a revised delivery plan must be arranged. If the "late delivery" constitutes a redelivery, then the same policies apply.

1.3 High Risk Deliveries

Topical programmes that deliver within two days of transmission are defined as high risk. They must not only have an agreed delivery plan, but they must also have known and communicated contingency plans in place to mitigate risk.   If a "late delivery" within two days of transmission is to be agreed, programme makers or commissioning editors should engage with Media Management to establish and agree with the planned delivery and confirm the agreed broadcast contingency plan (BCP). Topical programmes that deliver on the same day as TX are defined as critically high-risk and should be avoided. Where this is not possible, and an exception is agreed, an agreed delivery plan including known and communicated contingency plans will need to be implemented. All prerecorded programmes must be available for playout a minimum of – 4 hours before transmission time.

1.4 Standard Operating procedures for all late deliveries

All late deliveries (exceptions) need to be requested and agreed in advance between Commissioning Editor, Supplier and RTÉ operational stakeholders. If an exception request is to be approved, all parties must agree on the new delivery time and date. After the file is delivered to RTÉ (in adherence with the delivery time agreed), the file will undergo a full technical QC and will then be imported into the RTÉ Asset Management System for full, real-time compliance viewing. Only once this process is complete is the file ready for transmission.

Access services require that all supporting documents for .stl file creation should be sent to subtitle@rte.ie by pre-agreed date to allow reasonable time for subtitle file creation or assist live subtitling. Any changes to script should be emailed, including time codes, to subtitle@rte.ie as soon as possible.

1.4.1 Standard Operating Procedure for delivery within two days of transmission.

The following applies for deliveries within two working days of transmission:

There should be an exchange of key contact/stakeholder information in the event of a technical or editorial issue with file or fault with file delivery to RTÉ. The programme owner should ensure that a Broadcast Contingency Plan (BCP) has been agreed and communicated to Playout (for line up) as back up in the unlikely event the delivered file is unable to transmit. For same day delivery, which can only be on a strict exceptional basis, the file delivery time should be no less than 4 hours before transmission. In cases of same day delivery, a standby live playout "back up" may be required. For same day deliveries, access services advise that all subtitling will be live.

2. Programme File Redelivery

RTÉ has a policy of not accepting redelivery of programme files, particularly content that has already been fully processed and approved by RTÉ i.e. fully technically QC'ed , compliance viewed and embellished with access services. Therefore, unless instigated by RTÉ (i.e. due to a QC failure, legal issues or a change requested by RTÉ), redelivery requests may be rejected by Media Management. RTÉ invites programme makers to refer to the RTÉ Final Delivery Check List in advance of all delivery to reduce the risk of a redelivery request being required. Redelivery of programme file(s) must be requested through the RTÉ Redelivery Form before any action can be taken. As a rule, redelivery

requests will be rejected; however, there are a small number of exceptions to this policy outlined below.

2.1 Redelivery Exceptions
There are two main instances where an exception to the above can be made:

2.1.1 Technical QC fail by RTÉ.
After delivery all content must subsequently satisfy an internal Quality Control process. Any assets found to be non-compliant will be rejected at the point of delivery. Rejection will be communicated to Supplier, and a redelivery will be requested by RTÉ at no additional expense. The supplier will be supplied with a Technical QC report outlining the reason for the failure.

2.1.2 A significant technical, editorial issue or legal issue arises.
These require clearance from senior stakeholders in RTÉ. Requests for a redelivery of a programme must be submitted to Media Management via the Redelivery Request FORM in advance of any redelivery.
CONTENT LATE DELIVERY & REDELIVERY REQUEST FORM – Fill out form
Such requests will then go through an internal RTÉ process for approval depending on the rationale for the redelivery. If approved by relevant stakeholders, then a redelivery can proceed.

2.1.3 Redelivery information.
As part of the redelivery request process, suppliers should inform RTÉ as quickly as possible of any potential redelivery by submitting the redelivery request form. Suppliers should inform RTÉ of all changes from the original version, including if there are any duration changes, timecode changes etc. This information should be included the Redelivery request form. This is to aid compliance and access services teams.

2.2 Redelivering and Replacing IPU programme files on RTÉ Platforms
2.2.1 Redelivery Pre-TX
If a redelivery request is accepted a replacement/new Media ID will need to be generated by Broadcast Media Management. This will then be shared with the Supplier to enable them to deliver in adherence with RTÉ delivery workflows. Broadcast Media Management cannot create replacement Media IDs out of office hours. The file should be delivered following the normal file delivery protocol. RTÉ will not purge the original version unless informed. Request to purge the original version should be sent to Media Management.

2.2.2 Redelivery post-TX (replacing a programme that has already transmitted).
In cases whereby a programme file is replacing an existing original file on Linear or on the Player, there is a sequential multi-step procedure that must be followed. The programme maker must notify Broadcast Media Management as well as Player of the redelivery request. If request is approved and once the revised file has been received, Broadcast Media Management may purge the original file from relevant systems upon editorial approval. Depending on when the discovery and/or request is made, the original file may remain on the Player until the team is available to remove it. Likewise, the original may be removed and there is down time before the new version is published to the platform. The original programme file must be retrieved from 3rd party platforms.

APPENDIX 3: RTÉ TECHNICAL, QUALITY AND PROGRAMME REQUIREMENTS – TELEVISION LINEAR AND NON_LINEAR

This part of the document details the technical and quality requirements that all programmes must comply with. It also forms a binding obligation on the producers of programmes that are delivered to RTÉ. Assessment of quality is highly subjective, and therefore dependent on the nature of the programme. Some of the quality requirements are expressed in relative terms ("reasonable", "not excessive" etc.), and it will be necessary to make a judgement as to whether the quality expectations of the intended audience will be fulfilled, and whether the broadcaster will feel that value for money has been achieved. Every programme submitted for transmission must satisfy the RTÉ technical QC process, which is detailed in the "Delivery of Master programmes" section of this document. Any programme failing to meet these requirements, or any of the other QC requirements, may be rejected and returned to the supplier for repair.

1. VIDEO TECHNICAL REQUIREMENTS

1.1 Video Format
High Definition - The HD format is fully specified in ITU-R BT.709-6
All material delivered for HD transmission must be:
• 1920 x 1080 pixels in an aspect ratio of 16:9
• 25 frames per second (50 fields) interlaced - now known as 1080i/25.
• colour sub-sampled at ratio of 4:2:2

1. 2. Origination

1.2.1 Interlacing and Progressive
Material may be originated with either interlaced or progressive scan. Interlaced and progressive scan material may be mixed within a programme if it is required for editorial reasons or the nature of the programme requires material from varied sources.

1.2.2 Post-Production
Electronically generated moving graphics and effects must be generated and added as interlaced to prevent unacceptable judder.

1.2.3 Film motion or 'film effect'
It is not acceptable to shoot in 1080i/25 and add a film motion effect (field stripping) in post-production. Most High-Definition cameras can capture in either 1080i/25 or 1080p/25. It is not acceptable to shoot progressive for an interlaced delivery or conversely where film motion is a requirement, progressive capture is the only acceptable method.

1.2.4 'i' and 'psf' Flags
All programmes must be delivered with flags set in video streams to 'i' throughout the programme, even if the bulk of the programme has been originated progressively. This is because some equipment introduces processing to 'psf' flagged material which degrades some material. RTÉ may accept certain material with 'psf' flags entirely at their discretion.

1.2.5 Field dominance

Cuts in material must happen on frame boundaries (i.e. between field 2 and field 1). Motion on psf material must always occur between field 2 and field 1 (i.e. field 1 dominance). Note - It is possible to shoot material at 1080p/50. If this is done, the correct 2-frame marker phasing must be maintained when down-converting to 1080i/25 or 1080psf/25.

1.3 Video Line-Up

Programme video levels must be accurately related to their associated line-up signals. Video line-up must be colour bars of the type known as EBU 100% or 75% (100/0/100/0) or (100/0/75/0) and filling the 16:9 raster. SMPTE pattern bars are not acceptable.

1.4 Video Levels and Gamut (illegal signals)

High-Definition digital signals will be assessed according to the recommendation ITU-R BT709-5 Part 2. Video levels must be received within the specified limits so that the programme material can be used without adjustment. Any signal outside the specified limits is described as a gamut error.

1.4.1 Measuring signal levels

Digital video levels are usually measured with a device which displays a trace like a traditional waveform monitor. This gives readings in mV (emulating an analogue signal), or as a percentage of the allowable levels. The limits of signal levels are defined by reference to a nominal black level and a nominal white level. Black level comprises R, G and B all at zero (or 0% or 0mV) and white level is all three components at 100 % or 700mV. In a picture signal, each component is allowed to range between 0 and 100% (or 0mV and 700mV). This equates to digital sample levels 16 and 235 (8-bit systems) or 64 and 940 (10-bit systems).

1.4.2 Tolerance of out of gamut signals

In practice it is difficult to avoid generating signals slightly outside this range, and it is considered reasonable to allow a small tolerance, which has been defined as follows under EBU Rec103: • RGB components must be between -5 % and 105% (-35 and 735mV) therefore • Luminance (Y) must be between -1% and 103% (-7mV and 721mV) Slight transient overshoots and undershoots may be filtered out before measuring, and an error will only be registered where the out of gamut signals total at least 1% of picture area. Many monitoring devices are designed to detect errors to this specification.

1.5 'Blanking'

HD images must fill the active picture area (1920 x 1080 pixels). No 'blanking errors' are permitted on new, up converted, or archive material. However, a two-pixel tolerance will be permitted during CG or complex overlay sequences where key signals, graphic overlays or other effects do not fully cover the background image. Where animated key signals or overlays cause moving highlights at the edge of the active image it is preferable to blank these pixels completely. A note of the timecodes and reasons for these errors should accompany the delivered programme.

1.6. Picture Aspect Ratio

All commissions must fill a 16:9 screen vertically and horizontally without geometric distortion. The following exception may be allowed but the broadcaster must give permission. 'CinemaScope Ratios' as Letterbox Movies should be delivered with an active picture ratio that matches the current consumer release unless the broadcaster requests otherwise. Movies and programmes with picture ratios of 2.35:1/2.39:1 (21:9) or 1.85:1 should be centred vertically between black bars in a 16:9 frame with no geometric distortion. If there are any variants of aspect ratio, please contact RTÉ to establish the required version.

1.6.1 Floating images

Short sequences of images surrounded by black borders, (floating images), may be used for artistic effect. Note however, that widescreen consumer TV sets operating in Auto Zoom / Auto mode often interpret large black borders at the top and bottom of the screen as letterbox, so are likely to enlarge the picture. The resulting unpredictable zooming can be annoying for the viewer and undermine the artistic intent. If used, the black space around floating images must be consistent across sequences of images.

1.6.2 'Pillarboxed' HD material

Some 'pillar-boxed' material is acceptable with prior agreement with the commissioning editor. Where material has been acquired on a medium that has the capability to be transferred to a legitimate HD resolution, for example, 35mm film shot using 4 perf at an aspect ratio narrower than 16:9. The pictures must be centrally framed in a 16:9 raster with no geometrical distortion.

1.7 Archive Material

Archive material must be taken from the best available source, and any improvement or restoration work which could reasonably be expected must be done (for example grading, dropout repair or audio equalisation.) Archive material must meet all the requirements in this document, including those for up-converted SD video where relevant, except for the following:
Picture Aspect Ratio Archive material that is not 16:9 should be zoomed to fill the 16:9 raster where possible without compromising the image quality or composition. Alternatively, it may be presented in a pillar-box or letterbox format, which:
may be of an intermediate ratio between 4:3 and 16:9but must be of consistent width across sequences.
and
•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)
•must be black outside the active picture, unless otherwise specified by the broadcaster.

1.7.1 Safe areas - archive

Any captions or text already in the archive material should be kept within the caption safe area, if possible, but if not, should be noted in the accompanying documents.

1.8 Use of Non-HD material

Some high-definition programmes will contain some material from standard definition originals, and sources which are not considered to meet HD broadcast standards, such as domestic camcorders. This material is all called 'non-HD' in this document. To maintain a high standard and meet audience expectations the amount of non-HD material is limited to 25% of the programme's total duration. Non-HD material must not be used for large uninterrupted sections of the programme, unless agreed by the broadcaster. This includes archive material.

1.8.1 non-HD material

Material acquired using the following methods or formats is considered to be below the high definition standard and will therefore be treated as non-HD: • HDV from all manufactures • Most cameras with image sensors under ½" • Frame based (intra-frame) recording formats below 100Mbs • Inter-frame based recording formats below 50Mbs • 720 line equipment • Film not meeting the requirement for HD in section 2.8 below .

1.9 Film for High Definition

Acquisition Super16 film is not considered to be high definition no matter what processing or transfer systems are used. The following 35m m film types and stock are acceptable for high-definition acquisition; • 3 perf - any exposure index although an exposure index of 250 or less is preferred. • 2 perf – only if daylight stock with an exposure index of 250 or less is used. To avoid causing problems with high-definition transmission encoding film should be well exposed and not forced more than one stop.
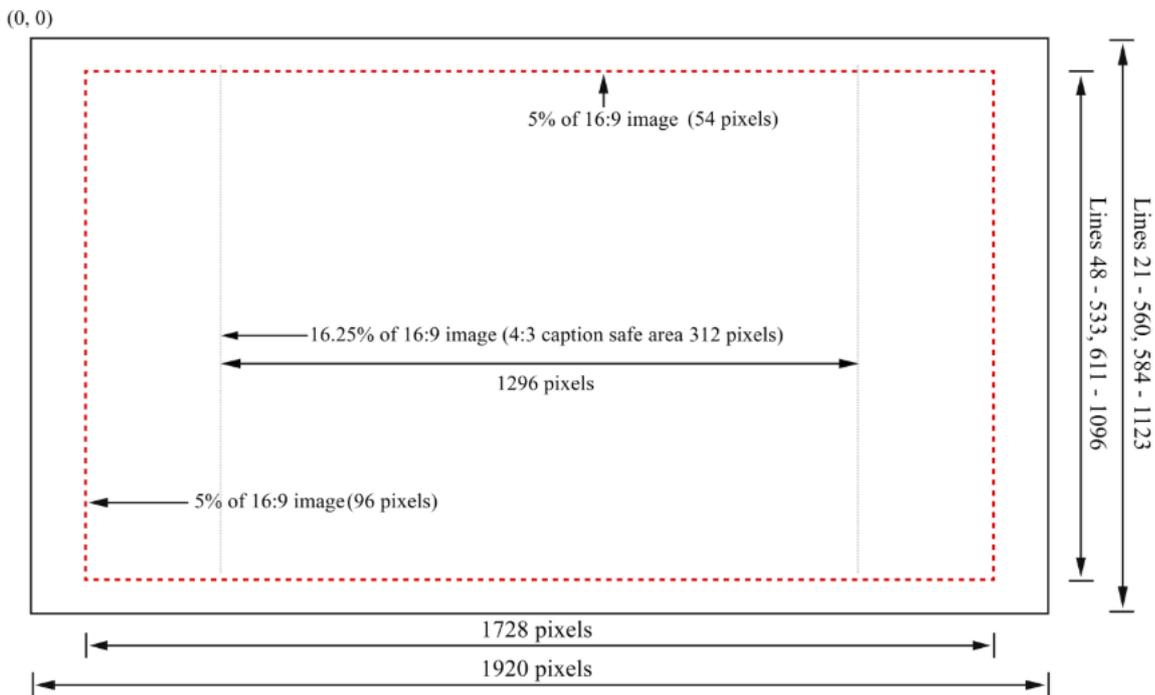
1.10 Safe Areas for HD ON SCREEN TEXT

All on-screen text (captions and credits) must be clear and legible and must be within the safe areas specified. All font sizes must be legible after down conversion. Text size: the minimum height of the text should be no less than: 40 HD lines/pixels (to be legible after down conversion). There are two primary caption safe areas defined for transmission of 16:9 programmes.

- 16:9 used by most programmes/broadcasters including RTÉ.
safe
- 4:3 required by some broadcasters for end credits or
safe for programmes distributed internationally. Check the broadcaster requirements for guidance on end credits.

All programmes transmitting on RTÉ should adhere to the 16:9 safe area.

Text Safe Area for 1920 x 1080 (Interlace)	Defined as percentage (%) of active picture	HD pixels (inclusive) first pixel numbered 1	TV line numbers (inclusive) line numbering as per "ITU-R BT.709"
16:9 Text safe	90% of Width	96 – 1 823	-
	90% of Height	54 – 1025	48 – 533 (F1) & 611 – 1096 (F2)
4:3 Text safe	67.5% of Width	312 – 1 607	-
	90% of Height	54 – 1025	48 – 533 (F1) & 611 – 1096 (F2)

(0, 0)

5% of 16:9 image (54 pixels)

16.25% of 16:9 image (4:3 caption safe area 312 pixels)

1296 pixels

5% of 16:9 image (96 pixels)

Lines 21 - 560, 584 - 1123

Lines 48 - 533, 611 - 1096

1728 pixels

1920 pixels

1.11 Standards Conversion

When standards converted material is included in a programme, Motion Compensation (sometimes known as Motion Predictive or Motion Vector) standards conversion is required. Currently speed change is the preferred method of changing between 24fps (including 23.98) and 25fps standards. Due attention must be given to the audio. Use of non-linear editing platform hardware or software standards conversion is not permitted for whole programmes but may be used for short inserts.

2. AUDIO TECHNICAL REQUIREMENTS

RTÉ will implement the EBU R128 (Loudness normalisation and permitted maximum level of audio signals) for all material including file delivery. Audio must be delivered with track layouts as specified below.

2.1 Stereo Audio Requirements

Stereo tracks must carry sound in the A/B (Left/Right) form. If mono originated sound is used, it must be recorded as dual mono, so that it may be handled exactly as stereo. It must meet all the stereo standards regarding levels, balance and phase.

2.1.1 Stereo line-up tones

All stereo tracks must use EBU 1KHz tone (left ident). All tones must be sinusoidal, free of distortion and phase coherent between channels. Digital Audio Reference level is defined as 18dB below the maximum coding value (-18dBFS) as per EBU recommended practice R68.

2.1.2 Stereo audio levels and measurement (loudness or volume)

Stereo programme audio levels are currently measured by Peak Programme Meters (PPM). The Maximum or Peak Programme Level must never exceed 8dBs above the programme's reference level. The following levels, as measured on a PPM meter to BS6840: Part 10 with reference level set at PPM 4, are indicative of typical levels suitable for television, and are given as guidance only.

2.1.3 Stereo phase

Stereo programme audio must be capable of mixing down to mono without causing any noticeable phase cancellation.

2.2 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.

2.2.1 Audio / Video sync markers

To assist in maintaining A/V sync through the post-production process, a 'sync plop' may be used. If the delivered programme leader contains one it must meet the following conditions: • The sync plop must be between timecode 09:59:57:06 and 09:59:57:08 • The audio plop must be 1kHz tone on all tracks at -18dB (standard zero level) • The duration of the vision flash must be 2 frames to allow it to pass through standards conversion successfully • The audio plop must be synchronous across all audio PCM audio tracks and with the video flash (within +/- 5 ms) • If an end sync plop is used it must be no closer than 10 seconds to the end of the programme and comply with the points above.

Material	Normal PPM	Peaks Full Range PPM
Dialogue	3 to 5	3 to 6
Uncompressed Music	5	2 to 6
Compressed Music (depending on degree of compression)	4	3 to 4
Heavy M & E (gunshots, warfare, aircraft, loud traffic, etc.)	5 to 6	
Background M & E (office/street noise, light mood music)	1 to 3	

3.QUALITY CONTROL (QC)

3.1 General Quality

It is the responsibility of the production company to ensure programmes meet the technical and editorial requirements of the commission. All programmes are expected to reach a high standard of video and audio quality. This does not mean that low-quality material cannot be used. Archive and specialist low quality material used in context is acceptable.

3.2 Picture Quality

The picture must be well lit and reasonably but not artificially sharp. The picture must be free of excessive noise, grain and digital compression artefacts. The picture must be free of excessive flare, reflections, lens dirt, markings and obstructions (e.g. lens hood), and lens aberrations. Movement must appear reasonably smooth and continuous and must not give rise to distortions or break-up for moving objects or cause large changes in resolution. The picture must be free of excessive black crushing and highlight compression. Hard clipping of highlights (e.g. by legalisers) must not cause visible artefacts on screen. There must be no noticeable horizontal or vertical aliasing, i.e. jagged lines, field or frame rate fluctuations in fine detail. Colour rendition, especially skin tones, must be consistent throughout, and a realistic representation of the scene portrayed unless it is altered as an editorially essential visual

effect. The picture must be stable and continuous - i.e. no jumps, movements, shifts in level or position. There must be no visible contouring / artefacts caused by digital processing. Quantisation noise must not be apparent. There must be no noticeable spurious signals or artefacts e.g. streaking, ringing, smear, echoes, overshoots, moiré, hum, crosstalk etc.

3.3 Sound Quality
Sound must be recorded with appropriately placed microphones, giving minimum background noise and without peak distortion. The audio must be free of spurious signals such as clicks, noise, hum and any analogue distortion. The audio must be reasonably continuous and smoothly mixed and edited. Audio levels must be appropriate to the scene portrayed and dynamic range must not be excessive. They must be suitable for the whole range of domestic listening situations. Stereo audio must be appropriately balanced and free from phase differences which cause audible cancellation in mono. The audio must not show dynamic and/or frequency response artefacts because of the action of noise reduction or low bit rate coding systems.

3.4 Photosensitive Epilepsy (PSE)
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. All content should be compliant with (PSE) ITU-R BT.1702

4. GENERAL PROGRAMME REQUIREMENTS
4.1. Programme layout/format
All programmes delivered on file must be laid out with elements in the following pattern relative to Timecode:

Timecode	Duration	Picture	Sound
09.58.00.00	90'	EBU Bars (100/0/75/0 or 100/0/100/0)	Lineup tone
09.59.30.00	27" 05fr	Ident and countdown Clock	Silence
09.59.57.06 (optional)	2fr	2 Frames peak white	1 Frame tone (on first video white frame)
09.59.57.06	2" 19fr	Black	Silence
10.00.00.00		Programme	Programme
End of part (multipart programmes)	5"	freeze or 'living hold' after end of part	fade or cut to silence by end of part
End of prog	10"	freeze or 'living hold'	fade or cut to silence
End of prog + 10" (optional)	2fr	2 Frames peak white	1 Frame tone (on first video white frame)

4.1.1 Start and end

Note that it is usual for sound and vision to be automatically cut to air on transmission, so early vision or sound is not normally required. Vision may fade up from black starting at 10.00.00.00 if desired. All programmes must end with a fade or cut to silence before the intended end point. Any fade out or reverb must be allowed for within the programme duration. Vision freeze or 'living hold' must be held for a further 10" after the end point. Any other programme elements after the end of the programme should not start less than 1min after end of programme.

4.1.2 Ad breaks

For hard-parted programmes, each part must be preceded by a countdown clock as below. There must be at least 15"of black and silence between the end of one part and the start of the clock for the following part. (i.e. after the 10" freeze) Each part must be recorded to begin at a 'full minute' - i.e. Timecode HH:MM: 00:00

4.1.3 The Ident Clock

A countdown clock clearly displaying the following information must precede the start of programme and any subsequent part:

- Filename- MEDIA I.D. / PLACEHOLDER (e.g. MIXXXXXX)
- Programme title (and series number if applicable)
- Episode number (if applicable
- Part number (if applicable)

The clock may not contain any identifiable personal information. No technical information or personal information may be included. This means HD format, aspect ratio, audio track allocations, safe area, contact details. More information about Clock Idents is included in 5.6 below.