

PROGRAM DELIVERY SPECIFICATIONS AND REQUIREMENTS FOR NOVA BROADCASTING GROUP

Releases Notes:

Version:	Changes in this document
1.0 / Nov 2010	Initial release
2.0 / Nov2012	Changes in File delivery specifications for Disney Channel
3.0 / Jan 2013	Added File Delivery specifications for: FOX, Cartoon Network and Discovery/TLC channels
4.0 / Apr 2013	New Loudness requirements (EBUR128) for NOVA added in audio section. General document change from “commercial” to “program” requirements
5.0 / Jul 2013	Changes in file delivery requirements for FOX Channel in App. 1 EBUR128 Loudness requirement added for all channels in App. 1
6.0 / May 2014	Changes in file delivery specifications for Cartoon Network
7.0 / Aug 2014	Added File Delivery specifications for City TV
8.0 / Sep 2014	Added File Delivery specifications for NOVA and FOX channels
9.0 / Febr 2015	Delivery specifications for materials’ length for all channels and exclusion of Cartoon Network’s parameters
10.0 / Sep 2015	Added File Delivery specifications for IDx and changes in the File Delivery specifications for NOVA
11.0 / Nov 2015	Changes in file delivery specifications for Discovery/TLC channels
12.0 / Feb 2016	Added HD file delivery specifications for Discovery/TLC channels
13.0 / Jul 2016	Added Tape Delivery Formats specifications for NOVA channels
14.0 / Jan 2018	Removed File Delivery specifications for DISCOVERY/ TLC Channel and IDx. Added File Delivery specifications for Scripps Networks International and Viacom International Media Networks
15.0 / Oct 2020	Updated program delivery specification SD/HD for NBG channels
16.0 / Nov 2022	Updated program delivery specification HD/UHD for NBG channels
17.0 / Mar 2023	Added requirements for Animated Graphics
18.0 / Mar 2023	Justifying audio requirements
19.0 / Nov 2023	Updated requirements for Animated Graphics

I. INTRODUCTION

Document Objectives

This document defines the technical standards for programs that have been commissioned or contracted by Nova Broadcasting Group (NBG) for broadcasting. The document is a compact reference for all those charged with delivering programs - production staff, including technicians and producers, independent production companies, and distributors providing programs for NBG. It sets out the technical requirements for delivery to ensure that the delivered material is of a satisfactory standard.

Technical Acceptance Procedures. QAR (Quality Assessment Review)

All materials delivered to NBG for transmission must be subject to a Quality Assessment Review prior to delivery.

As well, from NBG side, Quality Control will be performed on every delivered material to ensure it meets the requirements set out in this document.

NBG retains the right to final acceptance or rejection of any materials delivered which does not pass the Quality Assessment Review, whether measured or subjectively assessed.

Any program failing to meet the required technical standards will be referred back to the supplying production company.

The program must be delivered to NBG at least 48 hours prior to its programmed transmission in order to have enough time for rectification.

In case of issues about any program that does not fit the minimum acceptable technical requirement described in this document and is not possible to be fixed by the company producer, then NBG in-house team will try to fix the material.

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II. GENERAL TECHNICAL REQUIREMENTS

Video File Delivery Formats

File Delivery Format in HD resolution must be as follow:

Parameter	Value
File format/Container:	MXF
Format profile	OP-1a
Codec:	XDCAM HD422 50i PAL
Bit Rate:	50Mbps, CBR
Video Resolution:	1920x1080
Display Aspect Ratio	16:9, Square Pixels (1.0)
Frame Rate:	25 fps
Scan Type:	Interlaced
Scan Field Order:	Interlaced Upper (Top) Field First
Chroma subsampling:	4:2:2
Bit Depth	8 bits
Audio - 8 mono PCM Channels	CH1/CH2 – 2 mono PCM tracks – L/R Stereo Submix, 48kHz, 24-bit CH3/CH4 – same as CH1/CH2 CH5 to CH8 – no audio, or music&effects

Timecode for all materials should start from 00:00:00:00

File Delivery Format in UHD resolution must be as follow:

Parameter	Value
File format/Container:	MXF
Format profile	OP-1a
Codec:	XAVC QFHD LongGOP 4:2:2 - 2160p50
Bit Rate:	200 Mbps, VBR
Video Resolution:	3840x2160
Display Aspect Ratio	16:9, Square Pixels (1.0)
Frame Rate:	50 fps
Scan Type:	Progressive
Chroma subsampling:	4:2:2
Bit Depth	10 bits
Audio – 8 mono PCM Channels	CH1/CH2 – 2 mono PCM tracks – L/R Stereo Submix, 48kHz, 24-bit CH3/CH4 – same as CH1/CH2 CH5 to CH8 – no audio, or music&effects

Timecode for all materials should start from 00:00:00:00

Animated Graphics File Delivery Formats

File Delivery Format in **HD** resolution must be as follows:

Parameter	Value
File format/Container	Quicktime (.mov)
Codec	Animation / RLE
Cut-ins (horizontal) & Skyscrappers (vertical)	+ Alpha channel (RGBA)
Squese's (L shape)	No alpha channel (RGB only)
Video Resolution	1920x1080 pixels
Display Aspect Ratio	16:9, Square Pixels (1.0)
Scan Type	Interlaced / Upper Field First
Frame Rate	25 fps
Bit Depth	8 bits per channel
Duration	7 sec. (Squise's +1s / In=0,5s ; Out=0,5s)

The first and last frames must be blank.

File Delivery Format in **UHD** resolution must be as follows:

Parameter	Value
File format/Container	Quicktime (.mov)
Codec	Animation / RLE
Cut-ins (horizontal) & Skyscrappers (vertical)	+ Alpha channel (RGBA)
Squese's (L shape)	No alpha channel (RGB only)
Video Resolution	3840x2160 pixels
Display Aspect Ratio	16:9, Square Pixels (1.0)
Scan Type	Progressive
Frame Rate	25 fps
Bit Depth	8 bits per channel
Duration	7 sec. (Squise's +1sec. / In=0,5sec. ; Out=0,5sec.)

The first and last frames must be blank.

Audio Requirements for both HD and UHD animated graphics:

Parameter	Value
Codec	Uncompressed
Sample rate	48 kHz
Sample size	24 bits (Please pay attention to this parameter)
Channels	CH 1&2, Stereo
Loudness normalization	EBU R128
Target Loudness	-23 LUFS

Recording Reports

Every submitted material must be accompanied by a recording report, which must contain the following information:

- Title;
- Subtitle, version, or additional info about the spot if exists;
- Video Standard and Color Standard (HD, UHD / Rec.709);
- File format (wrapper), Codec, Bitrate;
- Duration (Start Of Message (SOM=first active frame of the spot) should be always 00:00:00:00);
- Audio Channels information;
- Details of the program supplier, recording facility house (name; tel., email).

The Recording Report must be a text file (.txt) in the same directory where the program spot is located.

If the material does not include a Recording Report it will automatically fail QAR.

The program duration should be measured from the start of the active video to the end of the active video.

General Video Requirements

All blanking, timings, amplitudes, and bandwidths of video material shall not violate the relevant CCIR/ITU System Specifications.

Video Level and Gamut (illegal signals)

Video levels including any line-up shall be received within the standard limits, so the program material can be broadcasted without additional adjustments and corrections.

Video levels/color signals must be legal in the digital video domain that meets the Rec. ITU-R BT.709 specification.

We require also that signals meet the EBU R103-2000:

System Bit Depth	Range in Digital Sample (Code) Values		
	Nominal Range	Allowable Min./Max.	Total Video Range
8-bit	16 - 235	5 - 246	1 - 254
10-bit	64 - 940	20 - 984	4 - 1019

Safe Areas for Action and Captions

Action Safe Area – 90% of active width and 90% of height;

Caption Safe Area – 80% of active width and 80% of height;

If electronic titles are present, they must be placed within the Caption Safe Area.

General Audio Requirements

The audio shall be free of spurious signals such as noise, hum and cross talk. Sibilance and distortion wow and flutter shall not be apparent. The audio shall not show dynamic and frequency response artifacts as a result of the action of noise reduction or low-bit rate-coding systems.

The end of the program sound shall occur 0.5 seconds before the end of the active video.

The dynamic range shall not be excessive but at the same time, excessive compression is strictly not acceptable. It shall be suitable for the whole range of domestic listening.

Audio signals must be suitable for reproduction in a domestic environment.

Mono recordings are not preferable. However, if this occurs they must be in the correct phase.

Audio Channels

Programs must be delivered in Stereo Mix format on mono CH1/CH2 and CH3/CH4.

The audio channels must conform to the following standard:

CH1 – Stereo Submix - Left;

CH2 – Stereo Submix - Right;

CH2 must be in phase coherent with CH1.

CH3 – Stereo Submix – Left / same as CH1;

CH4 – Stereo Submix – Right / same as CH2;

CH4 must be in phase coherent with CH3.

CH5 to CH8 – no audio, or music & effects

The recording report should state if the material is in mono mix format.

For all channels program audio levels must comply:

Program loudness: -23 LUFS (EBU R-128);

The Permitted Maximum Peak Audio Level shall never exceed 9 dBu above the audio reference level.

It means the program audio peaks should not exceed -9 dBFS on the Digital PPM Scale (0dB on DIN PPM).

Sound to Vision Synchronisation (Lip-synchronisation)

The relative timing of sound to vision shall not exhibit any perceptible error. As defined in ITU Rec. 562-3 (Ref: 6), audio shall not lead vision by more than 1 field (20ms) nor lag by more than 40ms. (40ms = 1 frame).

Audio Levels – Measurement, Reference Level (Line-up tone)

Audio levels, Line-up level, and the Maximum Permitted Audio Level should conform to EBU R.68-2000, EBU Tech 3304, ITU-R BS.645-2 technical recommendations.

Measurement:

Audio Levels shall always be measured by Program Peak Meters (PPM).

NBG is using 2 types of – Type I DIN PPM scale (IEC 60268-10) and Digital PPM Scale (IEC 60268-18).

Reference Level:

Reference (Alignment, Line-up) Level is a 0dBu 1kHz tone signal placed on the headers of the recordings.

In digital domain, the Reference Level is defined as 18 dB bellow the digital peak (which is the maximum possible coding value (-18 dBFS) of the digital system, irrespective of the total number of bits available).

As different types of PPM scale are used, for your convenience, down below is shown the Ref Level reading on most popular PPM scales:

	Digital Domain	Audio Domain		
	Digital Scale IEC 60268-18	Type I (DIN PPM) IEC 60268-10	Type IIa (British PPM) IEC 60268-10	Type IIb (EBU scale) IEC 60268-10
0dBu, 1kHz, Ref. Tone Level	-18 dBFS	-9 dB	Mark 4	Test

Specification for Loudness Leveling

Loudness leveling in EBU R-128.

Target Level for Program Loudness:	-23 LUFS (0 LU)
Maximum Short-term Loudness:	-18 LUFS (+5 LU)
Maximum True Peak Level:	-1 dBTP

The permitted deviation from the Target Level shall generally not exceed +0.2 LU.

For details concerning loudness audio measurement and adjustment 4 documents that include all aspects of the new standards can be found at

<http://tech.ebu.ch/loudness>:

EBU Tech 3341 Metering specification ('EBU mode')

EBU Tech 3342 Loudness Range descriptor

EBU Tech 3343 Practical Guidelines

EBU Tech 3344 Distribution Guidelines