



# ABU TECHNICAL COMMITTEE MEETING

#ABUTC2020

Doc T-20/20-3

## STATUS REPORT

Organisation:	NHK (Japan Broadcasting Corporation)		
Period:	Sep.2019-Aug2020	Date of Report:	30 October 2020

### PART A

#### Technical Developments during the past year:

- System upgrades/changes to practices for improved quality/efficiency

##### Cloud-based Video Editing system

NHK has introduced video editing software on the cloud to enable remote news editing. At first, news sources will be uploaded to the cloud-based system where 24 editing software are virtually installed. Then, operators will be able to edit the news source remotely using their pre-registered laptop. As a security measure, screen sharing system is adopted to avoid the news source to accidentally stream out into open internet.

During the state of emergency due to COVID-19, this system was scaled up so large number of editors could simultaneously access from their homes.

##### Development of 8K JPEG-XS codec corresponded to SMPTE ST 2110

NHK is developing real time 8K JPEG-XS codec targeting to be used in program production. So far, we have prototyped a PC-based codec with both 4x 12G SDI and 10G Ethernet interface along with external PTP (Precision Time Protocol). The data packets are completely compliant with SMPTE ST 2110. We evaluated the picture quality and verified that two 8K streams can be sent to one single 10GbE link without video degradation. Currently, we are developing FPGA-based codec to process 8K signal within 16 msec.

- New Services/new projects initiated

##### IP Remote Production

NHK has been working on IP remote production for live broadcasting, to establish a new style of program production. On-site equipment is connected to the broadcasting studio by IP lines, and remotely controlled to produce the program. Advantages of IP is not just reducing the number of cables, but also the efficient usage of equipment resources.

IP also makes it possible for various devices with different functionality to be connected as a large scale system, which enables flexible operation than before.

We have worked with vendors to conduct connectivity tests with various IP devices, and also challenged it on actual operation.

Although there are still minor issues with connectivity and monitoring, we have step up from trial phase to practical operation phase, hoping for full deployment in the future.

- Research projects

##### Advanced terrestrial broadcasts

NHK is developing advanced terrestrial broadcasting system that provides UHD resolution, HDR, object based audio, and IP hybrid services. This system adopts latest technologies to obtain higher spectrum efficiency, larger capacity transmission, and more robust transmission.

We have designed a prototype for both modulator and demodulator, and have measured its performance through laboratory experiments and field trials.

We aim to standardize this system in Japan by 2023.

### **High-resolution 3D Display System ~Natural 3D viewing experience without glasses~**

NHK is developing Aktina Vision, a unique 3D TV system for viewing natural 3D video without special glasses. Aktina Vision reproduces the light rays from the object to display 3D images. NHK has achieved higher-resolution 3D video system with high-definition television (HDTV) equivalent resolution (about 2 million pixels).

The object is captured from different viewpoints (horizontal and vertical locations) to obtain multi-viewpoint images, which are used to reproduce the light rays from the object. By increasing the number of the multi-viewpoint images and resolution of each image, natural high-resolution 3D video display can be achieved even when the viewer moves around horizontally and vertically in the viewing area.

The developed system accommodates 72 multi-viewpoint images, and video resolution is increased by using an 8K projector with a pixel-offset method. A special optical system shifts and multiplexes the light rays of the 72 high-resolution multi-viewpoint images.

We will continue to research on 3D imaging, video compression coding, etc. to achieve next-generation TV that can present video with unprecedented realism.

- **Internet and Mobile Broadcasting Services**

#### **Launch of simultaneous online streaming services**

After Japan's *Broadcasting Act* has been amended, NHK launched simultaneous streaming of its television programs from April 1, 2020, which allowed viewers to access from television, smartphones, and other mobile devices. The application is called NHK plus, and it provides two livestreams of NHK's terrestrial TV channels from 6am to 12am. It also provides on-demand service for 7 days from the air. As an additional service, sync subtitle system is provided for people with hearing problems using voice recognition and text matching technology. Additionally, the service "Playlist" is to provides a list of programs categorized by category and theme for each viewer to easily find their favorite program.

We will continue to provide services targeting mass audience but also aim to provide personalized service to each viewer.

			Radio	Television
Coverage %			MF Radio1:99.9% Radio2:99.9% FM:98.0%	Digital Terrestrial:98.2%
Programme Channels			AM Radio:2 FM Radio:1	Digital terrestrial:2 Digital Satellite (HD):2 Digital Satellite (UHD):2
Studios	File-based Set-up	R/N/D		
	SDTV	R/N/D		
	HDTV	R/N/D		
	UHDTV			
	IP Based Set-up	R/N/D		
Transmitters	HF	R/N/D	10	
	MF	R/N/D	Radio1 :265 Radio2 :146	
	FM	R/N/D	532	
	TV	R/N/D		Digital:2,215
	OTT/IBB/Internet Services	R/N/D		
	Mobile Services	R/N/D		

R = Replacement/upgrade    N = New    D = Discontinued

**PART B  
CURRENT ACTIVITIES**

	<b>Activities</b>	<b>Area</b>	<b>Brief Details:</b> 1. Objectives 2. Progress to date	<b>Challenges/Problems Faced:</b> 1. Lack of resources 2. Lack of know-how 3. Others (e.g. up-skilling)	<b>Solutions Implemented/Type of assistance requirement from ABU</b>
1.	<b>Development projects/Upgrading facilities/Training</b>				
2.	<b>Participation in ABU Activities</b>	<b>Area</b>	<b>Level of Participation</b>	<b>Reasons for not participating (though interested)</b>	
3.	<b>Suggestions for New ABU Activities e.g. study topic projects, workshops, symposiums etc, spectrum activities, new technology information flows</b>	<b>Activity 1</b>			
		<b>Activity 2</b>			
		<b>Activity 3</b>			