

# Newsletter ARIB SEASON



No.0022

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## Exhibition of EWBS at the NAB Show 2019

The National Association of Broadcasters Convention and Exposition (NAB Show) 2019 was held at the Las Vegas Convention Center in Las Vegas, Nevada, U.S.A. from 6 through 11 April 2019.

DiBEG (Digital Broadcasting Experts Group: the promotion organization of the Japanese Digital Terrestrial Broadcasting System which act as a subcommittee of ARIB Promotion Strategy Committee) participated in the Exhibition, by showing panels to introduce its international activities in the ISDB-T promotions and by performing demonstrations of EWBS (Emergency Warning Broadcast System), using a signage device at the "FUTURES PARK" in the North Hall.

We intended to exhibit and demonstrate the EWBS as one of the key features of ISDB-T. The demo system consisted of the transmission/reception equipment to simulate the EWBS operating situations in some of the ISDB-T adopting countries in Latin America, such as Peru and Costa Rica, putting emphasis on the concept of easily telecasting emergency warning information based on the digital terrestrial TV standard: ISDB-T.

The booth attracted visitors from those countries not adopting ISDB-T as well as those from adopting countries; yet they expressed their desire to have a similar system for broadcasting emergency warning.



EWBS Display and Demonstration

## The 7th Meeting with Brazilian SBTVD Forum in Las Vegas

The 7th meeting between ARIB/DiBEG and SBTVD Forum was held in Las Vegas on 10 April, during the NAB Show 2019. This regular meeting is being held twice a year, at the occasion of the NAB Show and the SET Expo.

From the SBTVD Forum Mr. Moisés Queiroz Moreira, Commissioner of ANATEL (AGÊNCIA NACIONAL DE TELECOMUNICAÇÕES), Mr. Carlos Fini, President of SET (Sociedade Brasileira de Engenharia de Televisão) and other executives were present in the meeting.

From the Japanese side Dr. Sugawara, Chairman of DiBEG, Mr. Nakatogawa, Task Force Chairman for the next generation broadcasting technologies, together with Mr. Kimura, Director for Digital Broadcasting Technology, MIC (Ministry of Internal Affairs and

Communications of Japan) as an observer, Mr. Takechi of NHK Engineering Service (via internet), Mr. Sakaguchi of JTEC and some other members joined the meeting.

At the start of the meeting the Brazilian side expressed their high appreciation to the Japanese side for their support during the introduction of digital terrestrial TV in Brazil, with their expectation of maintaining continuous collaboration as ever.

The Japanese side introduced the latest status in the development of 8K terrestrial TV broadcasting technologies, 4K terrestrial broadcasting technologies in conjunction with 2K parallel broadcasting, etc.

The Brazilian side explained their wide range roadmap from the start of digital terrestrial broadcasting up to the future broadcast services including 4K/8K. They expressed expectations on new broadcasting technologies emerging at the timing of the 2020 Tokyo Olympic/Paralympic Games, based on the fact that such technologies have advanced substantially at the occasion of the past major sport events such as Olympics and World Cups. They also explained the current status of the ASO (Analog Switch-Off) in Brazil, adding that the program has been going smoothly, with the permeation of receiver products in the consumer market.

Both parties agreed to proceed with their collaboration in the revision of the ABNT/ARIB Joint Document.

They discussed the introduction of EWBS to the ISBD-T adopting countries in Latin America including Brazil; and confirmed that they would continue working together for the EWBS introduction to these ISDB-T adopting countries in the region, including the incorporation of EWBS functionality into the ABNT standard.

They also agreed to continue harmonization of the Ginga and the Hybridcast technologies together.



Meeting with SBTVD Forum

The next meeting is scheduled to be held in Sao Paulo, Brazil in August, during the SET Expo 2019.

## FoBTV Meeting in Las Vegas

FoBTV (Future of Broadcast Television) held a meeting in Las Vegas on April 10, 2019, during the NAB Show. The FoBTV is a voluntary organization with 85 members of more than 20 countries of professional broadcasters, standardization organizations, etc., to share and exchange views and opinions on the future of TV broadcasting. They hold a regular meeting twice a year; in April during the NAB Show in Las Vegas, and in September during the IBC in Amsterdam.

Approximately 30 people attended the meeting including 6 people from Japan; from NHK, MIC and DiBEG.

### (1) Standardization Activities

Representatives of ATSC, DVB and ARIB respectively reported their latest development in their standardization activities since the last meeting.

#### ■ ATSC

ATSC set up the Planning Team and the Implementation Team, each continuing its activities to fulfill their objectives. The Planning Team, according to the report, is studying new video compression CODECs for future applications, as well as research and development of applications of broadcasting technologies to the automobile industries. The Implementation Team is working on personalization of TV, emergency broadcast applications and the establishment of environment for conformance test on ATSC 3.0.

ATSC also introduced various educational programs for field engineers to grasp the contents of the ATSC 3.0 specifications.

Frequency repacking program to introduce the ATSC 3.0 into operation was reported.

#### ■ DVB

Progress in the DVB group regarding the introduction of new technologies such as target advertisement, in-house IP distribution, Low Latency Dash, Multicast ARB (Adaptive Bit Rate), HDR, etc. was reported.

DVB added that a study group was launched to study the next generation broadcasting, considering the possibility of using the 5G technologies as a means to realize UHD (Ultra High Definition) TV broadcasting.

#### ■ ARIB

The latest status of BS 4K/8K broadcasting services, on-going R&D schedules on the terrestrial 4K/8K broadcasting, etc. was reported.

It was also reported that ARIB had made revisions on the standards and specifications in relation to studio equipment and systems as well as content distribution network.

### (2) Latest Activities of Research Organizations

NHK of Japan reported their pilot project of 8K terrestrial digital TV broadcasting performed in Nagoya and Tokyo.

ETRI of Korea reported a seamless connection of broadcasting and internet transmission, taking advantage of the ATSC 3.0 features, and also reported their latest efforts in 8K terrestrial digital TV broadcasting.

TV Globo of Brazil presented their introduction of HDR and Immersive Audio as a part of their development toward the next generation TV service; They also reported their latest development of DTV Play for the IBB service.

(3) 5G Broadcasting

Rohde & Schwarz of Germany reported their trial 5G broadcasting in Germany. The general specifications are reported as follows;

Frequency: 750 - 758MHz

Bandwidth: 5MHz

Locations of transmission:

at Wendelstein and Ismaning, with 64km distance in-between

Transmission output power: 5kW (Wendelstein), 7kW (Ismaning)

NERC DTV of China reported their latest status on the 5G broadcasting in China.

FoBTV confirmed that they would continue their efforts in its study of 5G roadcasting from the viewpoint of the entire body.



FoBTV Meeting

The next meeting was scheduled to be held at the occasion of IBC in Amsterdam in September 2019.

### Digital Terrestrial TV Seminars in Bolivia

The Plurinational State of Bolivia decided to adopt ISDB-T as its national terrestrial TV standard in July 2010 and started trial broadcasting in September 2011.

In response to the request from Ministry of Public Works of Bolivia, MIC joined the seminars in the two cities: Santa Cruz and Cochabamba.

The seminars were held on 14 May in Santa Cruz City and on the next day in Cochabamba City using the lecture hall of the local university. From the Bolivian side, the Ministry of Public Works, Services and Housing, Deputy Secretary's Office, Transportation ATT executives, government officials, broadcasters, students, etc. participated. From Japan, Broadcasting Technology Division and International Cooperation Division of MIC, JTEC who participated as ARIB / DiBEG, MassPro Denko, etc. participated.

In the city of Santa Cruz, 195 people attended the seminar. The Bolivian side introduced the characteristics and promotion of terrestrial digital broadcasting so far, and the outline of licensing for broadcasters and operators who compile and transmit multiple terrestrial digital broadcast programs on one channel, following the opening remarks given by President Carballo of Private Technological University of Santa Cruz SA (UTEPSA), Dr. Dorado of ATT and Deputy Director of MIC, Mr. Daisuke Sasaki. Then it was also announced that the deadline for analog switch-off (ASO) across the country was delayed by two years from the initial plan, and the last ASO in the country would be 30 November 2025.

From Japan, MIC explained the advantages of ISDB-T, particularly EWBS, various kind of data broadcasts, hybrid cast and mobile broadcast services. MIC also introduced the history and experiences leading up to ASO in Japan and stated that he hoped the relationship between the two countries will continue to be closer, celebrating the 120th anniversary of the immigration of Japanese people.

ARIB / DiBEG explained the advantages of digital system for analog system, various usage examples, transmitters for digital terrestrial broadcasting, the dissemination of EWBS technology overseas, and technologies and notes on receiving terrestrial digital signal.

Regarding the Ginga middleware, an overview of the latest Profile D was introduced from the Brazil SBTVD Forum, based on the development history of it.

The seminar in the Cochabamba city on the next day, 204 participants were counted. Following the opening speech given by Mr. Lic. J. Rios del Prado, Principal of the University of Mayor de San Simon, Mr. Ing. Gustavo Pozo, Vice Minister of Telecommunications and Mr. Sasaki of MIC, Japan, the same lectures as previous day were presented.

On both days, an exhibition site was set up outside the seminar hall, and introduction of DiBEG activities, demonstration of EWBS, reception of terrestrial digital broadcasting through the antenna and transmission equipment including multiplexer were shown.



Seminar in Santa Cruz



Demonstration in Cochabamba

## 5G Huddle 2019 in Tokyo

The “5G Huddle 2019” was held in Tokyo in May 2019. The 5G Huddle is held in conjunction with the WWRF (Wireless World Research Forum), and this time experts from inside and outside the country gathered and discussions were held on the theme of "The 5G dream becomes a reality - Can it keep its promises?"

### 1. Outline

- (1) Title of the Event: 5G Huddle 2019 Tokyo
- (2) Theme: The 5G dream becomes a reality - Can it keep its promises?
- (3) Host: WWRF, 5GMF, supported by MIC
- (4) Date : 14 May 2019, 9:00-18:00
- (5) Venue: Aoyama TEPIA, Tokyo
- (6) Participants: About 100

### 2. Program

Opening	Title	Speaker
	Introductory remarks	Dr. Kohei Satoh 5GMF Mr. Nigel Jefferies WWRF Mr. Mario Maniewicz ITU-R (Video presentation)
Keynote Speech	Title	Speaker
	Update of 5G Deployment plan in Japan	Mr. Takehiro Nakamura NTT DOCOMO
Session1	<b>Where are we with 5G deployment and where do we want to go?</b>	
	Title	Speaker
	5G deployment in Asia	Mr. Byungsook Kim Korea Telecom
	5G deployment in Europe	Mr. Bernard Barani European Commission
	5G deployment in the USA	Mr. Sudhir Dixit WWRF
	Plan for 5G Deployment in Africa	Mr. Paris Mashile ICASA
Session2	<b>Learning from real-world experiences - The role of trials and test-beds in shaping the 5G vision</b>	
	Title	Speaker
	The Global Picture	Dr. Hendrik Berndt WWRF
Session3	<b>5G Roundtables – Paving the way to deliver the promises of 5G</b>	
	Title	Moderator

	Panel 3.1 - Connectivity	Mr. Takehiro Nakamura NTT DOCOMO
	Panel 3.2 - 5G Standards and Coordination	Dr. Kohei Satoh 5GMF
	Panel 3.3 - Business models and use cases	Mr. Tim Miller Plum Consulting
	Panel 3.4 - Building confidence in 5G	Mr. Anand R. Prasad Rakuten Mobile
<b>Closing</b>	Title	Speaker
	Closing remarks	Mr. Nigel Jefferies WWRF



5G Huddle

As one of the founding members of WWRF, Werner Mohr of Nokia who had been also the first chairman of WWRF and have promoted the collaboration between WWRF and the Japanese Mobile IT Forum, was awarded and took up to WWRF's fellow.



Mr. Werner Mohr Awarded for Fellowship

**The 42nd Meeting of the Wireless World Research Forum**

The 42nd WWRF 2019 Tokyo Meeting was held at Aoyama TEPIA from 15 to 16 May 2019, sponsored by WWRF and co-sponsored by 5GMF. This year's WWRF was held following 5G

Huddle 2019 on 14 May, under the theme of "The 5G dream becoming a reality-can it keep its promises?" Experts gathered from around the world and discussions were held.

## 1. Outline

- (1) Title of the Event: The 42nd Meeting of WWRF, Tokyo
- (2) Theme: The 5G dream becomes real - will it keep its promises?
- (3) Host: WWRF, supported by 5GMF
- (4) Date: 15 - 16 May 2019, 9:00 - 17:00
- (5) Venue: Aoyama TEPIA, Tokyo
- (6) Participants: About 50

## 2. Program

\* Only the plenary sessions are listed below, the sessions for WG were also held during the meeting period.

Session1	Session Chair: Dr. Hendrik Berndt	
	Title	Speaker
	Beyond 5G in the next European Research Program	Mr. Bernard Barani European Commission
	Empowering Transatlantic Platforms for Advanced Wireless Research	Dr Alain Mourain InterDigital
	Wireless Beyond the Shannon Limit	Prof. Izzat Darwazeh University College London
Session2	Session Chair: Prof. Seiichi Sampei	
	Title	Speaker
	5G Evolution and Beyond - Real and Future -	Dr. Yoshihisa Kishiyama NTT DOCOMO
	Implementing IPv6 over 5G networks	Sureswaran Ramadass, Professor Emeritus, Malaysia University of Science and Technology
	Technical Trend of Access Infrastructure for Accommodating Mobile Traffic toward Beyond-5G Era	Dr. Kosuke Nishimura KDDI Research, Inc.
	Debate: Is 6G Needed or is it a Researchers' Dream?	Panelist: all speakers in Session1, 2
Session3	Session Chair: Vinod Kumar	
	Title	Speaker
	Launch of WAI white paper	Dr. Sudhir Dixit
	Next Generation ICT Technologies - Handbook on ICT in Developing Countries vol.2	Prof. Knud Erik Skouby Aalborg University, Denmark
	THz fixed wireless links for future mobile networks (Invited)	Prof. Tetsuya Kawanishi, Waseda University Thomas Kuerner TU Braunschweig, Germany

On 15 May, a special session on next-generation wireless communication systems was held on the theme of "Key innovation to Beyond 5G."

Session 1 was chaired by Dr. Hendrik Berndt, and the approaches to beyond 5G were reported. In Europe, the discussions and projects of Beyond 5G and 6G have already been started, and based on the requirements of 5G, Smart Networks & Services, terahertz communication, AI and machine learning, energy efficiency, security, etc. are being studied. In the European and US initiatives, roadmap development, system requirements and the evolution of 5G NR (New Radio) for 6G are revealed. In wireless communications that approach the limit of Shannon's theorem, the possibility of non-orthogonal waveforms, millimeter wave communications, antennas, etc. are reported after coding, spatial multiplexing, etc. were described.

Session 2 was chaired by Professor Seiichi Sanpei of Osaka University, and the evolution of 5G and its adaptation to growing mobile traffic. The possibility of technology expansion such as new frequency bands, cooperation with non-cellular systems, utilization of AI, wireless technology, etc. were presented regarding the evolution of 5G and beyond. To cope with the mobile traffic increase, the development of wired wireless networks compatible with 5G, such as the utilization of optical fiber, softwareization and the virtualization of wireless networks were suggested. There was also a panel discussion where the changes from the initial concept of 5G development, the key to the next generation mobile and the 3THz barrier in terahertz communication were discussed.



WWRF 2019 Special Session



Session 1 Chair:  
Dr. Hendrik Berndt



Session 2 Chair:  
Prof. Seiichi Sanpei

## Radio Day Memorial Lecture

"Radio Day Memorial Lecture" was held in Tokyo on 27 May 2019, organized by ARIB, co-sponsored by the Council for Info-Communications Promotion Month, and supported by the MIC. This event had been originally established in 1951 memorizing the enforcement of the laws related to radio wave regulations on 1 June 1950 in Japan.

Main theme of the Lecture was "Current status and future prospects of radio wave usage", and the lectures were delivered from executives of MIC, companies and organizations involved in radio wave use.

### Program

	Lecturer	Title
1	Mr. Yasuhiko Taniwaki: Director-General of the Telecommunications Bureau, MIC	Toward Realization of a Data-Driven Society - Comprehensive Verification of Competition Rules etc. in the Telecommunications Business Field -
2	Mr. Yoshihisa Yamada: Representative Director and President Rakuten Mobile, Inc.	Rakuten's approach to go into the mobile carrier business
3	Mr. Akihiko Chigono: Executive Director Japan Broadcasting Corporation (NHK)	The present and future of broadcasting that continues to evolve
4	Mr. Mototaka Taneya: Managing Officer BU President Corporate Research & Development BU SHARP CORPORATION	Life in 2020 which will be transformed with 5G+8K



Radio Day Memorial Lecture

## **APT Wireless Group (AWG) awarded by ITU**

A ceremony to commemorate the 50th anniversary of the ITU (International Telecommunications Union) World Information Society and Telecommunications Day takes place on 17 May at the ITU headquarters in Geneva, and APT Wireless Group was awarded for promoting standardization of the fifth mobile communication systems.

1. Title of the Event: The 50th anniversary of World Telecommunication & Information Society Day (WTISD)
2. Date: 17 May 2019, 10:30 – 14:00
3. Venue: Popov Room in the ITU headquarters, Geneva
4. Organizer: ITU
5. Participants: Around 150 members, including major members of industry, academia, officials of ITU and the organizations related to United Nations, in addition to the diplomatic officials of member states, participated.
6. Program: A panel discussion was held with an award ceremony to commemorate the 50th anniversary of the global information society and telecommunications day.

(1) Theme: Bridging the standardization gap

(2) Congratulatory message and Welcome remarks:

The congratulatory message from UN Secretary-General António Guterres was read by Malcolm Johnson, Deputy Secretary-General of the ITU, which said "Technical advances such as 5G and IoT have the potential to bring great social and economic benefits."

ITU Secretary General Houlin Zhao said that, "The international standards provide the technical foundation of the global market and have important influence for connecting the world", stressing the importance of the ITU standards, also mentioned "5G have potential to support new applications, including autonomous vehicles and smart cities, when combined with AI", and presented a video summarizing the 50 years of WTISD.

(3) Panel discussion:

At the event, a panel discussion was held along with an award ceremony to commemorate the 50th anniversary of the global information society and telecommunications day.

Theme	Digital Transformations Enabled by Comprehensive Standardization Activities	
Moderator	Chief, Study Groups Department, ITU-T: Mr. Bilel Jamoussi	
Panelists and their Assertions		
Organization	Panelist	Comment
WHO	Chief Scientist: Ms. Soumya Swaminathan	There is a need to clarify undesirable effects that digital technology has on people's health and ensure that it does not have a major effect. "Safe Listening Standards" has been jointly developed by the ITU and WHO, and "AI and health" is under development.
	CIO: Mr. Bernardo Mariano	
UPU	Deputy Director-General: Mr. Pascal Clivaz	Progress that Digital finance make in financial inclusion and its derived issues
UNECE	Executive Secretary: Ms. Olga Algayerova	Importance of capacity building initiatives to fill the gap between smart cities and communities, standardization
ISO	Secretary-General: Mr. Sergio Mujica	

#### (4) Award Ceremony

The WTISD Award for the achievements of six individuals or organizations over the four years from 2015 to 2018 in the following five categories were given by the ITU Secretary-General.

Category	Awardee	Achievement
Awareness	APT Wireless Group	One of the most highly contributed regional organizations in promoting IMT-2020 standardization activities (*1)
Know-how	ITU-T SG3: Mr. Lwando Bbuku	Improved expertise in international standards development as co-chair of ITU-T SG3
Community	Tunisia	Hosted a significant number of ITU conferences to bring together the international standardization community
	America	
Engagement	China	Sent the most representatives participated in ITU standardization work
Partnering	Korea	Contributed to the ITU's "Bridging the Standardization Gap" (BSG) program through the excellent financial and physical support

\*1 Dr. Kohei Satoh of ARIB received the Award representing AWG as a chairman.



Congratulatory message read by Mr. Malcolm Johnson



Welcome remarks by Mr. Houlin Zhao



Awarding Ceremony



Address of Thanks by Dr. Kohei Satoh



Award winner, Panelists and Executives of ITU

## The 55th CJK IMT Working Group Meeting in Busan

CJK IMT Working Group Meeting is aiming to exchange information and views about the activities of international IMT standardizations in ITU-R, APT, 3GPPs, and so on, among members of SDOs in China, Korea, and Japan.

## 1. Outline of the meeting

Schedule	29 and 30 May 2019
Venue	Seacloud Hotel (Busan, Korea)
Participants	ARIB (Japan) 9, CCSA (China) 7, TTA (Korea) 13



The 55th CJK IMT meeting

## 2. Main results

- (1) The results of the 31st ITU-R SG5 WP5D meeting held in February and the recent discussions at 3GPP were reviewed.
- (2) Information was shared and opinions were exchanged regarding the future proposal to ITU-R of IMT-2020 wireless interface, activities of external evaluation groups, and progress in preparation for AWG-25 and APG19-5 to be held in July.
- (3) Activities of the three Special Interest Groups (SIG-Spectrum, SIG-Evaluation, SIG-V2X) were reported and views on the trend in each country were exchanged.
- (4) Information was shared on preparation progress of each country for the 32nd WP5D meeting scheduled to be held from 9 July, and it was decided that joint contributions on three documents would be studied based on the common part of each SDO's proposal.

## 3. Next meeting schedule

- The next CJK IMT Working Group Meeting will be scheduled on 26 and 27 September 2019 in Kyoto, Japan.

## 5G Security Workshop at Wireless Technology Park (WTP) 2019

A seminar "5G security workshop - for a safe and secure 5G society -" was held on 30 May 2019 by the co-sponsorship of 5GMF and ARIB as a part of "Wireless Technology Park 2019", one of the Japan's largest-scale annual event that focuses on the latest R&D of wireless communication technologies.

In this workshop, the results as of the end of May 2019 of the 5GMF Strategy & Planning Committee, Security Studies Ad Hoc, which had been established last year, were reported, and Q&A sessions were also held by participants and speakers.

### 1. Outline of the Workshop

Schedule	30 May 2019, 10:30 - 12:30
Venue	Tokyo Big Site (Tokyo, Japan)
Organizer	5GMF, ARIB
Participants	About 100

### 2. Lectures, Sessions

Title	Speaker	Outline
(Welcome Remarks)	Mr. Yoshinori Ohmura 5GMF	- Welcome address - Latest activities of 5GMF
Approach of MIC for 5G realization	Mr. Hajime Nakamura MIC	- The third year in 5G Trial focusing on local issues - Completion of 5G frequency assignment to carriers (April 2019) - Planned 5G frequency assignment to local entities
Introduction of Security Studies Ad Hoc, and outline of 5G security	Dr. Satoru Tezuka Keio University (Leader, 5GMF Security Studies Ad Hoc)	- Activities of 5GMF security study Ad Hoc - Plan of setting up the "Security Study Committee" - Three use cases of 5G to be studied
Use case 1 - IoT security -	Mr. Kazuhiko Ishii NTT DOCOMO (Sub leader, 5GMF Security Studies Ad Hoc)	- Twelve issues extracted and organized from the study results and documents related to IoT security
Use case 2 - FinTech security -	Mr. Takashi Kawano Hitachi (Sub leader, 5GMF Security Studies Ad Hoc)	- Classification of Fintech services in 5G - Points to be considered about security generated by changes in financial service - Current issues on personal authentication and their directions of solution

		- Two items to be studied in 5G security study
Use case 3 - Connected Vehicle security -	Mr. Toshiaki Tanaka KDDI (Sub leader, 5GMF Security Studies Ad Hoc)	- Introduction of the four service areas of Connected Vehicle, network requirements and 5G functions assumed to be applied to Connected Vehicle - Identification of threats from each service - Report on the progress of 5G security issues for service realization
(Q&A)	- Authentication method fit to the Connected Vehicle service - Service model in the FinTech era - Future activities such as putting together white papers,	



Seminar

**The 23rd General Assembly of Electromagnetic Environment Committee and Briefing session on sponsored researches**

The 23rd General Assembly of Electromagnetic Environment Committee (EEC) was held at ARIB in Tokyo on 3 June 2019, where business / financial report was accepted and business / financial plan was approved. Following the General Assembly, briefing session on sponsored researches from EEC was also held. The content of the briefing was as follows.

	Contractor	Title of briefing
1	Prof. Yoshikazu Ugawa: Assistant Prof. Setsu Enomoto: Fukushima Medical University	Study on the influence of LTE on event related potential using human auditory stimulation
2	Prof. Tomonori Sakurai: Gifu Pharmaceutical University	Evaluation of influence of high frequency magnetic field on calcium dynamics



Briefing session on sponsored researches

### The 1st Study Group Meeting on Terahertz Sensing

The 1st Study Group Meeting on Terahertz Sensing was held on 5 June 2019, participated by 30 people, from ARIB member companies, NICT (Institute of Information and Communications Technology), and as observer, 5 organizations and MIC.

This study group had been established in February 2018 aiming to promote realization of Terahertz wave applied system by clarifying applications and studying development issues, frequency requirements and institutional issues. Study was conducted in the field of communication in the first fiscal year (~ March 2019), and in the sensing field in the second fiscal year (~ March 2020) with newly recruited members.

At the first meeting on sensing, Dr. Iwao Hosako, Director General of NICT was elected as the chairman as with the previous committee.

Dr. Hosako and the observers introduced Terahertz sensing technologies and their applications, and the opinions were actively exchanged on the future direction of study and research viewpoint.



The 1st Study Group Meeting on Terahertz Sensing

## 5G Events in Bangkok

The “5G Workshop” and “Technology Exchange Meeting” co-organized by MIC of Japan and Communications and the National Broadcasting and Telecommunications Commission (NBTC) of Thailand, and co-sponsored by ARIB and 5GMF were held from 12 to 13 June 2019 in Bangkok, Thailand.

### <5G Workshop>

#### 1. Outline of the Event

Title	NBTC-5GMF Joint Workshop on 5G
Organizer	NBTC (National Broadcasting and Telecommunications Commission, Thailand), MIC
Co-sponsor	ARIB, 5GMF
Schedule	13 June 2019, 9:30 - 16:30
Venue	The Berkeley Hotel Pratunam Bangkok (Bangkok, Thailand)
Participants	Thailand: about 150 NBTC, Telecommunications Carriers, Manufacturers, Universities and Research institutes  Japan: 10 MIC, Telecommunications Carriers, Manufacturers, Research institutes and 5GMF

#### 2. Program

Opening	Title	Speaker
	Welcome Remarks	Mr. Saneh Saiwong NBTC
		Mr. Kouichi Katagiri MIC
	Keynote Address	Mr. Prasert Silphiphat NBTC
Keynote Speech	Title	Speaker
	Cross-regional collaboration towards the realization of 5G	Dr. Kohei Satoh 5GMF
Technical Presentation	There were seven presentations from Japan (MIC, 5GMF), and five from NBTC.	
Wrap-up, Q&A and Closing	Based on questions and comments from the audiences such as "Strategies and practice of frequency allocation for 5G in Japan, Results of 5G trial and 5G use cases", questions and answers were held intently with presenters, having Mr. Thirapiroon Thongkamwitoon as a Moderator.	



NBTC-5GMF Joint Workshop on 5G



Presenters at the Workshop on 5G

< **Technology exchange meeting** >

1. Outline of the Meeting

Title	5G Meeting between 5GMF and the NBTC Officers
Organizer	NBTC (National Broadcasting and Telecommunications Commission, Thailand), MIC
Schedule	12 June 2019, 14:20 - 16:45
Venue	The auditorium at the headquarter of NBTC (Bangkok, Thailand)
Participants	Thailand: about 100 Mainly, members of NBTC Japan: 10 MIC, Telecommunications Carriers, Manufacturers, Research institutes and 5GMF

2. Program

Presentation from Japan	Theme	Speaker
	5G R&D Activities	Dr. Kentaro Ishizu NICT

	5G Field Trials in Japan	Dr. Yukihiro Okumura NTT DOCOMO
		Mr. Seichiro Sakai KDDI
		Mr. Hitoshi Yoshino Softbank
	5G Use Cases in Japan	Mr. Katsumi Tagami NEC
		Mr. Takaharu Nakamura Fujitsu
Presentation from NBTC	Theme	Speaker
	NBTC Preparation for 5G & Field trial activities	Dr. Nattawut Ard-Paru NBTC
		Dr. Pratompong Srinuan NBTC
Exchange of opinion	It was decided to consider holding technology exchange meeting like this time continuously in the future.	



Presenters at the Technology Exchange Meeting

### **The 9th Annual General Meeting and the 27th Board of Directors of ARIB**

The 9th Annual General Meeting, and the 27th Board of Directors of ARIB were held on 25 June 2019, at the Hotel New Otani, Tokyo.

Business and financial report of the fiscal year 2018, elected officers and Management Advisory Committee members had been approved at the General Meeting, and Mr. Tatsuya Tanaka was elected as a new chairman at the Board of Directors held after the General Meeting.

Further, revision of the articles of ARIB was approved, in which the purpose and business were expanded to work on various radio wave usages instead of being limited to the telecommunications and broadcasting fields currently.



The 9th Annual General Meeting

## The 30th Radio Achievement Award

The 30th Radio Achievement Award ceremony was held on 25 June 2019, just after the 9th Annual General Meeting of ARIB. This award is presented every year by the MIC and the Chairman of the Board of ARIB to individuals and groups who have made a significant achievement relating to effective and proper use of radio wave.

This year's winners are as follows.

### 1. The Award of the Minister of Internal Affairs and Communications

- (1) "Development of 4K・8K UHD broadcasting equipment and practical application of new 4K・8K UHD based TV master system for the Satellite Broadcasting"  
NEC Corporation
- (2) "Promotion of reorganization of slot assignment of the right-handed circular polarization channels in the 12GHz Broadcasting Satellite Services band with the start of the 4K and 8K satellite broadcasting services in Japan"  
Association for Promotion of Advanced Broadcasting Services (A-PAB)
- (3) "5G standardization"  
NTT DOCOMO

### 2. The Award of the Chairman of the Board of ARIB

- (1) "Development and implementation of robust noise suppression technology under high-noise environments for digital business radio system"  
Mitsubishi Electric Corporation

- (2) "Commercialization of high efficiency satellite communication system for remote island communication and disaster countermeasures" (\*Tentative Title)  
NIPPON TELEGRAPH AND TELEPHONE CORPORATION (NTT)
- (3) "Development of Portable UHF Band Transmission Broadcasting Equipment and Antenna for Emergency Use"  
Kansai Television Co. Ltd.
- (4) "Opening up Radio Access Network"  
NTT DOCOMO
- (5) "Practical application of mobile phone base station (ship type base station) using ship at the time of disaster" (\*Tentative Title)  
KDDI CORPORATION



Commemorative photo with awarded members

### The 7th Global 5G Event and EuCNC 2019 in Valencia

The Seventh Global 5G Event hosted by 5G-IA was held in Valencia (Spain) from 17 to 21 June 2019, together with EuCNC (European Conference on Networks and Communications) 2019. The Global 5G event, which had been amended to be held once a year by the 5G promotion groups in Japan, Europe, the United States, China, Korea and Brazil, was held on the theme of "Creating the Smart Digital Future" and the EuCNC 2019 on the theme "Enabling Smart Connectivity".

At this time of global 5G event, specific services were reported from Korea and the United States, etc., which had already begun commercial 5G service, and reports on trials for various use cases in various countries around the world increased. In addition, it can be stressed that discussions were actively conducted toward the concept development of Beyond 5G or 6G.

5GMF exhibited a booth in the hall and presented panels and videos that described progress on introducing 5G and the comprehensive 5G trials in Japan. The booklets summarizing the results of last year's 5G trials were distributed, and drew much interest by European officials who were working on a 5G demonstration project.

## 1. Outline of the Event

Title	The 7th Global 5G Event
Organizer	5G-IA (5G Infrastructure Association)
Schedule	17 - 21 June 2019
Venue	Valencia Conference Center (Valencia, Spain)

## 2. Summary / Topics

<b>OPENING SESSION</b>
<ul style="list-style-type: none"> <li>■ Welcome statements</li> <li>■ 5G Policy perspectives</li> <li>■ Government Policies for 5G</li> <li>■ Progress of 5G Spectrum Harmonization and Regulatory Policy</li> </ul>
Moderator: Dr. Colin WILLCOCK (5G-IA)

There were lectures by representatives from four countries on spectrum harmonization and policies for 5G. From Japan, Mr. Gaku Nakazato presented status in deployment of 5G, results of 5G trial, local / private 5G in Japan under the title “5G Progress and Challenges in Japan”, and reported that 5G had the potential to change daily life, economy and society.

In the following Keynote Speech, Mr. Tomás Alonso of Orange (Spain) introduced the effort to 5G titled “Orange Spain on the road to 5G”, where person appeared suddenly with the hologram and began talking with the presenter. It was the demonstration of 5G which connected the hall and Orange office where the person on the hologram was, and that surprised the audience.

<b>SESSION 2: REGIONAL TRENDS</b>
<ul style="list-style-type: none"> <li>■ 5G Research and Technological Trends</li> <li>■ 5G Trials and Pre-Commercial Launches</li> <li>■ New deployment strategies</li> </ul>
Moderator: Prof. Hyeon Woo LEE (DanKook University)

There were reports on R&D of 5G, demonstration tests and progress in commercialization. Dr. Yukihiro Okumura of NTT DOCOMO presented the latest results of 5G Trial in Japan.

<b>Q&amp;A: 5G COMMERCIAL SUCCESS</b>
<ul style="list-style-type: none"> <li>■ What is Needed for 5G Commercial Success</li> </ul>
Moderator: Mr. Ruprecht NIEPOLD (Independent Spectrum Expert)

The moderator asked questions about the conditions for commercialization success in each region, what are the key factors for success, and whether the timing of commercialization differs depending on the region.

Participant from each region pointed out business factors and social factors. And among them, Mr. Yoshinori Ohmura, Deputy Director General of 5GMF, stated that it is important for success to send a message that 5G helps solve social issues such as decline of workforce associated with aging and the revitalization of local communities.

<b>SESSION 3: 5G FOR BUSINESS</b>
<ul style="list-style-type: none"> <li>■ 5G from the Verticals perspective</li> <li>■ Sector driven 5G Service demands</li> </ul>
Moderator: Prof. Suncheol GWEON (5G Forum)

There were talks such as collaboration with vertical and trend on the service demand side. Ms. Yoko Kurosawa made a report titled “5G for Business” on KDDI’s activities such as open innovation and trial of remote control of construction equipment.

<b>SESSION 4: LOOKING FORWARD</b>
<ul style="list-style-type: none"> <li>■ Beyond 5G: Realizing Smart Networks</li> </ul>
Moderator: Mr. Chris PEARSON (5G Americas)

The reports related to the next generation mobile network were presented. All participants preferred rather “Beyond 5G” than “6G” for name of the next generation. After Mr. Ryo Inohara of KDDI introduced the development of 5G under the title “Beyond 5G ~Vision & Required Technology”, requirement for Beyond 5G was presented in the two categories, extension of 5G and new concept.

<b>LAUNCH OF THE 8TH GLOBAL 5G EVENT</b>
Speaker: Ms. Zhiqin WANG (IMT-2020(5G) Promotion Group)

It was announced that the next 8th Global 5G Event would be held in the end of June 2020 at the Shanghai International Convention Center, along with the MWC Shanghai 2020.

<b>SESSION 5: CROSS REGIONAL PROJECTS</b>
<ul style="list-style-type: none"> <li>■ Results and achievements from Cross Regional 5G projects</li> </ul>
Moderator: Mr. Yeqing DU (Huawei)

Europe, America, China, Korea and Brazil made report on the example of cross regional projects.

<b>SESSION 6: 5G KPI MEASUREMENT</b>
<ul style="list-style-type: none"> <li>■ Measuring 5G KPIs in real environments</li> </ul>
Moderator: Mr. Maurizio CECCHI (VIEW PRESENTATION)

At the end of the session Mr. Takaharu Nakamura of Fujitsu gave a report titled "5G KPI measurement in the real terms", and the 7th Global 5G event was closed successfully.

From the third day through the fifth day were assigned to EuCNC.

In the keynote speeches, lectures were given on the theme of "Internet reliability through Wi-Fi combined", "5G in Automotive", "Completing the 5G Vision", and "5G - A Door Opener For 6G?".

Discussions on the theme of "Beyond 5G" and "Future Connectivity and Network Security" were held in the Panel.

### Monthly seminars on radio wave use

<b>No.166</b>	18 April 2019
<b>Title</b>	Latest technological development trends and near-future prospects for practical applications in terahertz sensing imaging
<b>Speaker</b>	Dr. Iwao HOSAKO Director General, Terahertz Technology Research Center, NICT (Institute of Information and Communications Technology) Dr. Kaori FUKUNAGA Director, Electromagnetic Applications Laboratory, Applied Electromagnetic Research Institute, NICT Dr. Chiko OTANI Team Leader, Terahertz Sensing and Imaging Research Team, RIKEN Center for Advanced Photonics

<b>No.167</b>	24 May 2019
<b>Title</b>	Communication and broadcasting services at blackout caused by 2018 Hokkaido Eastern Iburi earthquake
<b>Speaker</b>	Mr. Masahiko FUJIMOTO Former Director-General, Hokkaido Regional Bureau of Telecommunications

<b>No.168</b>	17 June 2019
<b>Title</b>	Results of research and development on advanced technology of terrestrial television broadcasting and future efforts
<b>Speaker</b>	Mr. Tomoyuki KATO Deputy Director, Broadcasting Technology Division, Information and Communications Bureau, MIC Dr. Kenichi TSUCHIDA Senior Researcher Advanced Transmission System Research Division, NHK Science & Technology Research Laboratories

## Standards

### 1. Newly established Standards at Standard Assembly on 12 April 2019

STD Number	Standard Name	Version
STD-B74	The Use of ARIB STD-B73 Stream in Program Production with Essence-Independent-And-Multi-Stream IP Interface	Ver.1.0

This standard describes a method for transmitting RTP streams defined by ARIB STD-B73 using an IP interface conforming to SMPTE ST 2110-10. In this standard, system timing model, traffic shape model, etc. are defined.

(English Version not available)

### 2. Revised or abolished Standards at Standard Assembly on 12 April 2019

STD Number	Standard Name	Version
STD-T106	920MHz-Band RFID Equipment for Premises Radio Station	Ver.2.0
STD-T108	920MHz-Band Telemeter, Telecontrol and Data Transmission Radio Equipment	Ver.1.3
STD-T118	OFDMA/TDMA TDD for digital cordless telephone (sXGP)	Ver.1.2
STD-T119	200 MHz-Band Broadband Wireless Relay Communication Systems between Portable BS and MSs	Ver.1.1
STD-T120	IMT Systems based on 3GPP Specifications ARIB STANDARD	Ver.1.20



**Association of Radio Industries and Businesses**

ARIB SEASON  
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1-4-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-0013 JAPAN  
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