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in Chengdu, Sichuan
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Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



This issue of ABU Technology's *Technical Review* carries three articles on technology. An article contributed by Indian public broadcaster DDI, addresses experiences of repairing an RF combiner whilst another article, on spectrum issues, aims to raise awareness among ABU Technical Review readers of activities taking place in relation to the WCR-19 meeting. A third article describes the importance of communication during ASO and a case study from Thailand, outlining strategies of migration from analogue to digital terrestrial broadcasting and implementation of new services.

As is customary, the host of this year's TC and associated meetings, RTPRC, presents its profile. This edition also features the programme for 2017 ABU annual meetings.

A report on one of ABU Technology's key activities features PMPC-2017, the Pacific Media Partnership Conference held in Solomon Islands and hosted by SBC. A report on the 5th IBB OTT workshop, addressing IP from production to delivery, highlights key points from each of the presenters.

A report on technical advisory, carried out for radio broadcaster Voice of Vietnam (VOV), describes the mission in Vietnam.

The Asia-Pacific Broadcasting Union (ABU) is a professional union of broadcasting organisations in the Asia-Pacific area which aims to co-ordinate and promote the development of radio, television and allied services in the region. It is non-governmental, non-political and non-commercial.

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Strategies of Migration from Analogue to Digital Terrestrial Broadcasting and Implementation of New Services: Thailand Case Study



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abstract

This paper provides an overview of selected activities in Thailand related to transition from analogue to digital broadcasting. Thailand's legislation mandate put in place a master plan for spectrum management and a master plan for broadcasting in Thailand. Pursuant to the First Thailand Broadcasting Master Plan (2012-2016), transition from analogue to digital (terrestrial) broadcasting is one of seven strategies of the NBTC. In this regard, the NBTC has developed a roadmap for transition to digital terrestrial TV broadcasting in Thailand. The roadmap defines 39 service areas nationwide and each has 12 channels for Community Services. The total number of DTTB channel is 48 channels, 24 of which are allocated for national Business broadcasting services and 12 channels for national Public broadcasting services. 5 DTTB networks have been deployed, all operators agreed to share common infrastructure and facilities, network roll out plan target to reach 95% of household coverage within 4 years (2017 as outlined in an article published in TR-264, October-December 2015). This paper contains background to the transition to digital broadcasting, television broadcasting in Thailand, DSO communication, ASO planning and implementation, and lesson learned.

1. Introduction

Thailand's legislation stipulates that the National Broadcasting and Telecommunications Commission (NBTC) shall have mandates to put in place a master plan for spectrum management and a master plan for broadcasting in Thailand. The legislations mandate the NBTC to allocate at least 20% of frequencies allocated in each licensing area for public interest and community services; i.e. non-commercial purposes. The Act also states that an allocation of frequency to the civil sector for the purpose of television broadcasting services shall not apply until the digital transmission system is prescribed by the NBTC.

With these connections, apparently transition to digital terrestrial broadcasting plays a vital role in shaping up a new market structure for the broadcasting industry in Thailand, not only from technological point of view but also for efficient use of spectrum resources and optimal public benefits, especially civil societies and communities. Pursuant to the First Thailand Broadcasting Master Plan (2012-2016), transition from analogue to digital (terrestrial) broadcasting is one of seven strategies of the NBTC. More importantly, the Master Plan sets out indicators, among others, i.e.:

- Establishment of transition policies and plans for the switch to digital television broadcasting transmission within one year, and for the switch to digital audio broadcasting transmission within two years;
- Establishment of criteria and procedures for permission

to use radio frequencies for digital television broadcasting services within two years, and for permission to use radio frequencies for digital audio broadcasting services within three years;

- Commencement of digital audio broadcasting and television broadcasting transmission within four years.

In this regard, the NBTC has developed a roadmap for transition from analogue to digital terrestrial TV broadcasting in Thailand. The roadmap defines 39 service areas nationwide and each has 12 channels for Community Services.

As regards the State's obligation to the international community, the Thai Government announced in a transition to digital (terrestrial) broadcasting policy to the Parliament on 23 August 2011 that the government would efficiently use national radio frequency spectrum at the optimum level, promote public use of sound and television broadcasting as well as transition from analogue to digital (terrestrial) broadcasting taking into account optimal public benefits.

In addition, the government also adopted a policy aimed at promoting international cooperation especially among ASEAN Member Countries in order to ensure readiness of all stakeholders and help achieve target of the ASEAN Community to be effective by 2015, and to foster international cooperation with other countries in the region. Thailand also actively participated in the ASEAN Ministers Responsible for Information, AMRI which is a forum for discussions on transition from analogue to digital broadcasting in ASEAN Member Countries. At the 9th AMRI

held in Indonesia, the meeting agreed to use Digital Video Broadcasting-Terrestrial (DVB-T) as a common standard for digital broadcasting in ASEAN. Later at the 10th AMRI hosted by Laos DPR, the meeting adopted timeline for Analogue Switch-Off for ASEAN which is between 2015 and 2020, and also agreed to jointly determine a standard(s) for Set-top Box with an aim to make the price of Set-top Box affordable. The 11th AMRI held in Malaysia on 1 March 2012 considered that Digital Video Broadcasting- Terrestrial 2nd-generation (DVB-T2) is superior to DVB-T and hence agreed to adopt DVB-T2 as a common standard for ASEAN.

2. Television Broadcasting in Thailand

2.1 Broadcasting Landscape and Market Share

Broadcasting business plays an important role in social and economic development in Thailand, especially terrestrial television or free TV which is universally accessible by the Thai citizens. Hence terrestrial TV has been significantly influential to perceptions and behaviors of Thais from both social and economic aspects and has had impact to quality of life.

Television broadcasting started in Thailand 60 years ago. Transition from black-and-white TV to colour-TV took about 12 years; while transition from analog to digital has taken 46 years. In Thailand, approximately 22 million households have televisions which accounts for about 98% TV Households (TVHH) penetration which is higher than the average of the Asia and the Pacific Country. Prior to the transition to digital broadcasting, Thai people watched

(analogue) TV about 250 minutes per day on average. After migration to Digital TV, DTT viewers has been increasing continuously to 84% (or 54% comparing to traditional TV) in Dec 2016. In 2016, about 62% or 70,979 million Bahts (2.15 billion US dollars) were spent for TV advertisement and estimated to be 82,000 million Bahts in 2017 and advertisement revenues also moved from analog to digital terrestrial channels.

2.2 Thailand's Digital Switch Over (DSO) Policy

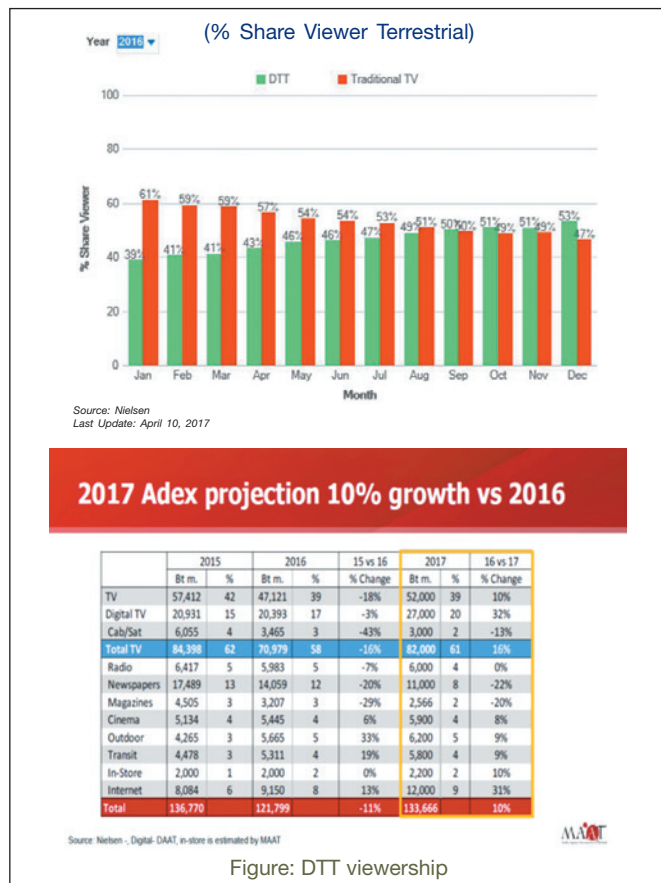
Transition to digital broadcasting has national impact and hence requires a clear policy from the government or an authority in order to ensure smooth transition. In Thailand, the National Broadcasting and Telecommunications Commission, an independent authority regulating Broadcasting and Telecommunications businesses, is mandated to develop a Master Plan for Thailand Broadcasting and issued a Notification on Transition to Digital Broadcasting which has following policy aspects.

2.2.1. TECHNOLOGY POLICY

In view of consumer protection, it is important to determine national standards for Digital Terrestrial Television Broadcasting (DTTB). It is also essential for smooth transition to digital Terrestrial TV broadcasting at effective costs and investments. Thailand has applied the following standards.

- 1) Transmission: DVB-T2 was selected as the national standard for transmission of DTTB in Thailand. It was proposed by NBTC and approved by the Cabinet on 20 May 2012. In this regard, NBTC determined technical specifications and published detail in its relevant Notifications.
- 2) TV Presentation Format: Thailand, through relevant NBTC Notifications, requires that both SD (Standard Definition) and HD (High Definition) must be available in digital broadcasting.
- 3) Video Compression: The selected standard for video compression in Thailand is MPEG-4 AVC/H.264. NBTC published technical specifications in its relevant technical Notification in this regard.
- 4) Audio Compression: For audio compression, the minimum standard selected for Thailand is MPEG-4 HE AAC V2 and alternative standards are any technologies which support 5.1 channel surround sound. Relevant technical specifications were published by NBTC.
- 5) Conditional Access (CA): As DTTB in Thailand is free TV, hence no standard is specified for conditional access.
- 6) Middleware or Application Programming Interface (API): No standard is specified for middleware/API in Thailand. However, any broadcaster wishing to install middleware/API needs to submit a proposal with details of the chosen standard and technical specifications to NBTC for approval. The selected standard must be compliant with open standard and certified by an international standardisation body.

As far as Emergency Warning System (EWS) is concerned, Thailand has adopted processes ensuring emergency warnings in coverage areas of DTTB for those broadcasters who are obliged to provide such emergency service as part of license conditions.



2.2.2. SPECTRUM POLICY

Thailand spectrum policy for DTTB covers the follows:

- 1) The UHF band is used for DTTB in compliance with the National Spectrum Management Master Plan.
- 2) Frequency planning takes into consideration both Single Frequency Network (SFN) and Multi-Frequency Network (MFN) with an emphasis on interference protection and efficient use of spectrum as a priority.
- 3) Maximising existing infrastructure and facilities and encouraging infrastructure (including network facilities) sharing.
- 4) Frequency harmonisation with neighboring countries.
- 5) DTTB must cover national, regional, and local services whose coverages are divided into zones according to technical characteristics of transmission and frequency plan. In this regard, sufficient frequencies must be ensured during the simulcast period (analogue and digital broadcasting in co-existence).

2.2.3. LICENSING POLICY

The main objective of the policy is to ensure fair and free competition by applying structure separation concept, resulting in the following license categories:

- 1) Network provider license
- 2) Facility provider license
- 3) Broadcasting service provider (broadcaster) license
- 4) Application provider license

3. DSO Communication and Information Support to Customers

3.1. DSO Planning

NBTC has a strategic framework for its public relations and communication to ensure proper awareness and transition from analog to digital switch over (DSO Communication Framework)



Figure 3.1 Strategic framework for public relations and communication

From this strategic framework, NBTC has organised a communication campaign and activities to promote mass awareness and nation-wide understanding of DSO. Main information and messages targeted to the general public.

3.2. DSO Communication and Tools

3.2.1. DSO COMMUNICATION

NBTC also organised a campaign to promote general understanding for Digital Switch Over by following strategic framework with channels/activities such as:

• DTV Mascot

NBTC launched a DTV Mascot called “Doo Dee”, Doodee mean good watching in Thai. The Doo Dee mascot is widely used by broadcasters, network operators, manufacturers and other relevant stakeholders to create awareness on DSO and Digital TV.

• DTV Song

A Digital TV Song was produced for promoting transition to digital TV, and NBTC has asked cooperation from TV and Radio Broadcasters. Network Operator to promote the DTV song as well as the mascot.

• DTV Communication Channels

- DSO Event/ Exhibition: organise events/exhibitions in collaboration with broadcasters and DTTB network operators
- DTV Broadcaster and DTV Receiver Engagement : request support for special events from Digital TV broadcasters and set-top box providers i.e. National Communication Day, participate in Red Cross event and help to promote set-top box upgrade, or support with movie stars and artists from those channels to help promote Digital TV awareness campaign
- Journalist and Blogger Engagement: organise workshop and DTV station site visit for journalists and blogger to promote understanding on Digital TV transition
- Property Engagement: Seeking collaboration from leading property developers to support Digital TV with proper installation of antenna and in-building cable for all the high rise resident buildings.
- National and local seminar: Organised seminar and training in particular areas to relevant organisations, government staff, student, local community leaders to create awareness and proper understanding the DSO policy and accept to adopt DTTB services
- A field operation in provincial area to promote awareness and understanding with general public by handing out Digital TV set-top box subsidy coupon before redemption date
- A Digital TV Seminar for academic faculty and students of vocational schools within Ministry of Education in each province with a live training broadcast to other 77 vocational schools nationwide
- Meeting with the Governor and head of Government Agency to communicate those key important rationale of the terrestrial Switch over from Analog to Digital TV
- Site visit in ASO area by area to promote public awareness and knowledge about the Analog TV Switch off / Digital TV Switch and Set-top box subsidy program since ASO has started.
- Creating a public campaign: “A Terrestrial Switch Over and proper transition plan for dormitory and apartment buildings” this campaign was supported by various associations such as the Child Development and Protection Agency, Child Social Benefits Protection Agency, and Children, Youth, Disable and Elderly Protection Agency from The Ministry of Social and Human Capital Development and those academic representatives with dormitory and student apartment network with an objective to support this terrestrial transition and migration within this student dormitory high rise building segment around Bangkok and other major provinces.

- SMS alert for general public on the Digital TV subsidy coupon expiration date

- Establishment of collaborative network for the promotion of public awareness, knowledge, and understanding for the general public

- NBTC and Office of Vocational Education Commission signed memorandum of understanding to collaborate on creating general public awareness on the terrestrial Digital TV campaign with an objective to accelerate awareness and understanding for citizen of all the districts and villages around the area within those provinces that already received the DigitalTV subsidy coupon via the collaboration with the office of Vocational Education Commission, Ministry of Education, where the their technical students nationwide support and assist general public for the installation of these new DigitalTV set-top boxes approximately 585,000 households.
- NBTC and the Royal Thai Army TV Station signed an MOU to collaborate on the topic “The Collaboration to promote the general public awareness and understanding on the terrestrial Digital TV” with an objective to install DigitalTV set-top box as prototype more than 2,670 locations within Government Agencies such as Provincial Administration Agency, police stations and public hospitals which are the main Government agency contact point with most frequent visits.

3.2.2. COMMUNICATION TOOLS

Application “DTV Service Area.” NBTC has created a smart phone application for users to check digitalTV ready footprint area and other features below. Such smart phone application are supported on Android, iOS and computer platforms via the website.

- Check for digital TV coverage within your area
- An adjustment of the Digital TV antenna direction
- An audit inspection of Digital TV transmitter in each provinces
- Find a proper distance from Mobile Tower (on an Android location accuracy will be better than location base application on normal mobile handset)
- Monthly Signal Transmission Plan
- An Audit Inspection of Information and channel for each towers
- List of channels that broadcast from various networks
- User can send feedback and recommendation to inform whether your current location is able to view DigitalTV properly or not with an objective to enhance the quality.
- Able to operate both on Android and iOS platforms including computer via website or application download

Download application sites as follows:

- For website please visit <http://dtvservicearea.nbt.go.th>
- For Mobile Applications (Andriod OS and Iphone iOS): ‘DTV services Area



3.2.3 SOCIAL MEDIA COMMUNICATIONS

- Website: <http://digital.nbt.go.th>
- Facebook: <https://www.facebook.com/digitaltv.nbt>
- Youtube: digitaltv.nbt
- Instagram: digitaltv.nbt
- Line Official: @NBTC

3.2.4 DTV 4 ALL, ALL 4 DTV CAMPAIGN

“DTV 4 All, All 4DTV Campaign” was a viral prototype campaign using social media. This campaign was fully supported by many movie stars, label artists, well known singers, famous speakers and experts from various fields. It aimed to illustrate Digital TV as a readily available and suitable alternative platform. We also promoted the handout and installation of the new digital TV set-top box campaign as a pilot and effectively reaching out to those target audiences, which included:

3.3 Information Support to Customers

NBTC established a feedback channel to answer general questions and public queries by calling 1200 free of charge and Set up Consumer Protection Subcommittee and Consumer Protection Bureau for customer complaint handling and promote media literacy. For Customer complaints, SLA is set up to control compliant handling process, and officers have to update/feedback the status to the customer.

NBTC provide information support customer via Call Center on DTV coupon approximately 513,000 calls between 10 October 2014 to 5 February 2016. Most calls are information inquiry with only 66 calls is as complaints.

3.4 DSO Monitoring

Office of NBTC has executed project DTTB User Survey to monitor the development of DTTB project and to get feedback of the Digital TV experience in order to improve Digital TV transition program and services. The objectives are to study how information can be received and process executed more effectively, to listen to general feedback and views about terrestrial DigitalTV and to study social impacts from our public relations and awareness campaign of the terrestrial switch over from analog to digital TV including concerns and obstacles in transmitting and receiving of this terrestrial digital TV platform ,and running Broadcasting Accessibility and User Behavior Survey to monitor DTTB services take up rate during DSO and to ensure an effective implementation before Analog Switch off date.

4. ASO Planning and Implementation

The NBTC Notification on Roadmap for transition from Analogue to Digital Television states its policy on Analogue Switch-Off (ASO) and Digital Dividend with an aim to gain the returned spectrum frequencies in 2015. Analogue TV operators are still eligible to use the spectrum frequency according to NBTC Organisation Act 2010 following the Spectrum Master plan (2012) and the first Sound and Television Broadcasting Master plan (2012-2016).

The ASO plan will be decided based on readiness of audience, operators and macro level conditions including timeframe between 2015 - 2020 commonly announced in the 10th meeting of AMRI (ASEAN Minister Responsible for Information) held in Laos. Such an ASO plan relies on a limited burden for television during simulcast period.

There are 6 analogue terrestrial television broadcasters in Thailand e.g. (1) Thai Royal Army:Ch5 (2) Public Relation Department:Ch11 (3) TPBS (4) MCOT (5) Bangkok

Entertainment:Ch3(6) Bangkok TV & Radio:Ch7. The Office of NBTC has co-operated with broadcasters (1) – (4) in transition from Analogue to Digital Television Broadcasting within 5 years after such 4 ATV broadcasters were granted DTTB Network license(s) in 2013, and Ch7 also agreed to switched off by 2018, hence 5 broadcasters agreed to switch off their ATV by 2018.

In consideration of ASO plan of the 4 ATV broadcasters, which also are the DTTB Network Operators, NBC assigned the DTTB Network Implementation working group to propose an ASO plan for the DTTB Network Operators to NBC. Their proposals are summarised below.

- 1) Declaring a date of ASO and effectively communicate the ASO to public and all relevant stakeholders.
- 2) Making use of the given frequency spectrum according to NBTC's announcement on frequency spectrum for digital terrestrial TV.
- 3) Readiness of audience in the areas where analogue TV is to be switch-off
- 4) Readiness of Digital Terrestrial TV to replace switched-off Analogue TV
- 5) Readiness of TV Channel players.

The four DTTB Network Operators have submitted ASO plan to NBTC, and Bangkok TV & Radio (Channel 7) who provide TV Broadcasting under concession with Royal Thai Army agreed to switch-off ATV by 2018. So far TPBS has shut-down its analogue system in Samui Island as the first trial of ASO process commonly conducted by the Office of NBTC and TPBS in Dec2015, and there are 50 ATV sites have been switched off as of August 2017. Activities include field study of ASO impact, creating awareness and understanding of DSO as well as Digital Television Technology and preparation for receiving digital TV services properly. For Bangkok Entertainment (Channel3) who provides TV broadcasting channels under concession with MCOT has planned to maintain their analogue TV services until the end of concession (2020) according to the Broadcasting Business Act, 2008 Section 81.

ATV Channel	ASO Plan (Started, Completed)	ATV Sites
Ch5	Dec2015-Jun2018	41
Ch9	Jun 2018	36
Ch11	Dec 2017	50
TPBS	Dec2016-Jun2018	52
Ch3	Concession 2020	33
Ch7	Aug2016-Dec2018 Concession 2023	37

Figure 4: Thailand ASO plan [Source: NBTC]

5. Lesson Learned and Recommendations

I. Digital Communication

- Mass communication to public in transition from traditional Analogue TV to Digital TV broadcasting is considered as critical activity to allow successful transition process.
- The published PR message has to cover key transaction activities, impact & benefits to audiences, including key

project time lines. Each message needs to be simple enough for mass audiences of various ages, from youth to senior citizen.

- Getting engagement from government agencies in state and local level, public agencies and relevant local parties are also key factors to drive a success of mass communication Digital TV transition.
- On-Line Communication such as Facebook, YouTube, twitter, line are the fastest and most effective channels to communicate directly to the people.

II. Digital TV Subsidy Programme

- Collaboration between the agencies who distribute the set-top-box coupons and other federal agencies who have regular contact with consumers helped to outreach campaign. And STB redemption process should be simple and easy for monitoring and reporting.
- Redemption DTV Coupon should be distributed to areas of DTTB signal coverage.
- If there is enough budget, DTV coupons should be distributed to every household and cover all groups of audiences.
- DTV coupon value should be enough to cover a qualified set top box with necessary accessories to receive signal well e.g. antenna and cable. Proper training for the STB installers prior to distribution of coupon and STB is a success factor for local to accept and support the transition from analogue to Digital TV service.

III. Receivers

- Develop common spec in ASEAN to achieve economy of scale production cost.
- STB-specification to include aces for people with disabilities, such as Audio Description (AD), Closed Caption etc.
- Collaboration with vocational schools and network operators to set up hotline and assist people with STB Receiver installation.
- Develop applications or tools to help the people to equip and align the antenna correctly like 'DTV Service Area' (Distance to the station, antenna direction, antenna type).
- Having variety of receiver types like portable DTV Receivers e.g. smartphone, tablet, or portable. Selecting proper antenna types and models for Set-Top-Box is important to receive signal well.
- Set up advisory group either by dedicated group or volunteer group to support installation.

IV. DTTB Network Rollout

- Sharing infrastructure and facilities can dramatically reduce network cost.
- Ensuring that network rollout, network coverage and network quality of every MUXs are ready to provide broadcasting services in the same period for fair competition.
- Regular network quality auditing to ensure that DTTB network quality is acceptable and satisfactory to people.
- Setting proper Service Availability (SA $\geq 99.98\%$ for DTTB network in Thailand), faster recovery, redundancy system/location should be well planned in network design in the first place.

- In order to make fastest rollout of TV network, NBTC decided to utilise existing antenna system and site facilities of existing network operators for other new digital network operators to share such systems. This will allow all operators to build 80% of household coverage within 2 years by using only single direction receiving antenna at each household.
- NBTC enforced the rule of ‘must carry’ for the commercial and public program broadcasters to commence broadcasting their content from day one on other broadcasting platforms e.g. satellite and cable TV which already cover more than 70% audiences in Thailand to increase ‘DTV eyeballs’.

V. Collaboration

- Collaboration with industry: ATV and DTV broadcasters, DTTB network operators, manufacturers, retailers is a key factor for successful transition, as well as encourage Real Estate-High rise building to install common DTV antenna.
- Collaboration with government agencies and public agencies at national and local level are also key factors to drive the success of digital transition.

VI. Set Up Trial

Trial of the DTT system at an early stage in transition before fully commercial launch was important to test the whole system and trial broadcasting markets.

VII. Licensing

Strategy for licensing should be contemplated carefully including proper research to design proper number of channel and licensing phases. Advertising Expense (ADEX) which is main revenue stream to broadcasters, relevant expense

on broadcasting, readiness of new broadcasters/players and quality of content production should be taken into account.

VIII. Rating of Television Broadcasting

Rating survey should be conducted to cover all broadcasting platforms including digital platform (i.e. internet) to have real broadcasting rating and user behavior.

IX. Call Center and Information to Support Customer

In cooperation with DTTB network operators to help people during installation of DTTB receivers and also build confidence on DTTB network quality.

X. Supporting Fund

During transition, the DSO programme project should get enough supporting funds for successful promoting and supporting of DSO throughout the process as well as supporting the broadcasting industry. In Thailand, Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP) was established by funding from an annual fee (up to 2%) with certain revenue shared by each business broadcasters.

6 References

Question 8/1: Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services, Ms Orasri Srirasa, Office of the National Broadcasting and Telecommunications Commission (NBTC), Thailand, ITU-D Study Group 1 Rapporteur Group Meeting, Geneva, 4 – 15 April 2016.



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Ms. Orasri Srirasa

Division Director of Digital Broadcasting Bureau, Office of National Broadcasting and Telecommunications Commission (NBTC), Thailand

Ms Srirasa has more than 20 years of experience in digital broadcasting and telecommunications with professional experience in implementing Digital Terrestrial TV in Thailand, developing Digital Radio broadcasting roadmap and roll-out plan and well as project leading on Radio Broadcasting Policy development plan for Thailand. She also led on the project Community TV framework development and implementation in Thailand and established 3 community TV prototypes in Thailand. As a director of Mobile Television Division, she is responsible for Mobile TV Services feasibility study and implementation strategy in Thailand. In addition she set up and led the Project DTTB user survey, developing broadcasting indicators for Radio and Television broadcasting service to monitor user reach and behavior.

She is chapter editor of ITU-D Study Group1 “Question 8/1: Examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services”, contribute to study group on developing the final report on guideline for transition to Digital TV and guideline DSO communication strategies in study period 2014-2017.

She has been invited to be as speaker in areas relevant to Digital Radio and Digital TV broadcasting, Mobile TV and Community Media in national, regional and international conference events organised by NBTC, ITU, ABU, AIBD, WorldDAB.

Ms Srirasa’s background includes telecommunication engineering in 3G Mobile Network and Fixed Network Planning and Operation, Service Quality Management, Applications and Software Development, and Data Intelligent Analysis, etc.

Prior joining Office of NBTC, Ms Srirasa worked for ITU on ITU/NBTC joint projects on digital broadcasting, and telecom companies such as True Corporation (first 3G/4G Mobile Service Operators in Thailand), Hutchison Wireless/BFRT (CDMA Mobile Network Provider in Thailand) and TT&T (1.5M Thailand’s fixed line operator). She was involved in 3G network and fixed line network planning, implementation and network operation, as well as IT applications development, E2E performance management and device testing.

Orasri holds Masters Degree in Information Technology and a Bachelor degree in Engineering from King Mongkut University of Technology Thonburi (KMUTT) and Finance from Ramkhamhaeng University (RU), Thailand.



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An Introduction to DTMB and DTMB-Advanced

DTMB & DTMB-Advanced, researched and developed by China are the 4th International DTT Standard and second generation of DTMB respectively.



Dr Kong Bin

Vice-Chairman of ABU
Technical Committee
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Senior Engineer
Academy of Broadcasting
Planning, SAPPRFT, PRC
Radio and Television of the
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DTMB

China digital TV development and industrialisation of major projects started in 1999 and a national leading group for digital TV was formed. Right from the first meeting, it was a clear strategy to devise technical standards independent of others. Existing technical features and advantages of Digital TV in China were summarised, addressing the specific application requirements. August 18, 2006 saw the introduction of the standard, GB20600-2006, China's Terrestrial Digital TV transmission standard for Digital Television Terrestrial broadcasting transmission system, defining the frame structure, channel coding and modulation. The project was hosted by the Chinese Academy of Engineering Terrestrial Digital TV standard task force for research. The standard was named "Digital Television Terrestrial Multimedia Broadcast", abbreviated as DTMB.

Time-domain synchronous orthogonal frequency division multiplexing, combined with a range of proposed technical characteristics, including a unified system bandwidth, symbol rate, frame structure, definition of system information, error correction coding and constellation graph mapping method, formed a complete system and technical scheme. Prior to the official announcement of the DTMB standard in May 2006, one month long laboratory and field performance tests showed that the DTMB system could effectively support high definition TV (HDTV), standard definition television (SDTV), multimedia data broadcast and other services simultaneously while meeting the needs of a wide range of fixed and mobile reception scenarios.

The DTMB system can effectively support both indoor and outdoor reception as well as fixed and mobile, portable reception. Among these, the fixed reception can receive support high-definition, standard definition, data and other multimedia information broadcasting, while the mobile service can receive the reliable support for standard definition, data and other multimedia information broadcasting.

A supporting standard, GB/T17975.1, was developed for data input interface. Although it adopted MPEG-2 TS stream input format, it did not adopt the structure of MPEG-2. However, it supports the AVS, MPEG-4 and H.264 source compression standards fully. The error correction code uses the LDPC code as the inner code, and the BCH code as

the outer code to provide better error correction capability. BCH code is BCH (1023, 1013) short-cut BCH (762, 752), which can be used to reduce the error rate and reduce the error level. It offers three LDPC codes, including 0.4, 0.6 and 0.8, respectively, LDPC (7493, 3048). LDPC (7493, 4572) and LDPC (7493, 6096); The DTMB standard supports including 32 QAM, 16 QAM and 64 QAM, 4 QAM constellations, 4 QAM – NR method of mapping. 64 QAM under the highest payload transmission rate can support up to 32.4 Mbps. 4 QAM payload transmission rate is more than 4.8 Mbps having a system interference management capability, high sensitivity and good mobile performance. It also supports high-speed mobile reception speeds over hundreds of kilometers per hour. 16 QAM is a compromise between efficient transmission and high-speed mobile reception that can be used as large and medium-sized cities small and medium range (20 to 50 km radius) mobile coverage. DTMB time-domain symbols are mixed between signal frames in order to improve the ability to resist impulse noise interference, having mixed symbol depths of 240 and 720 in two modes with end-to-end delay less than 300 ms. The multi-carrier mode also supports the interweaving of the frequency domain within the signal frame. The DTMB standard adopts the layered frame structure where the basic unit is the signal frame. Frame data processing is either single or multi-carrier modulation. For an example, consider multi-carrier modulation having a signal frame.

The frame has 3,780 subcarriers (subcarrier intervals 2 kHz). Among them, 3,744 subcarriers carry source data, 36 BPSK modulation subcarrier transmissions and TPS signals. TPS, number of data carriers, mapping methods, error correcting code rate, interwoven with protection interval length system information, such as in the closed end of the TPS signal demodulation are information from the transmitter end that can realise the receive function automatically. The DTMB standard adopted three kinds of length of PN sequence as protection interval, having the lengths of 420, 595 and 595 respectively Long protection intervals can support a wider range single frequency network, but also reduce the system efficiency.

DTMB has fully independent intellectual property rights. Several rounds of assessment recently discovered violations of

intellectual property rights possessed by DTMB. The use of the foreign patents led to payment issues for foreign patent holders. The participating units of the national standard research and development are currently applying for nearly 40 patents in the DTMB signal transmission format, with more than 200 claims. Three of them had been rated as foundational inventions in the 2002 China intellectual property office evaluation, and one had won the Chinese patent gold award in 2007. After the national standard enters the industrialisation phase, the patent license will be provided by the digital television national engineering research center for all patent holders to provide a one-stop patent service.

Milestones

August 1999

Digital TV R&D team and industrialisation subjects were confirmed.

December 2006

China DTT standard GB20600-2006 (DTMB) was released.

August 2007

DTMB was adopted in China.

December 2007

DTMB was launched in HK.

May 2010

DTMB was launched in Vientiane, Laos.

August 2010

DTMB was in adopted in Cambodia.

December 2010

DTMB was launched in the large and medium-sized cities in China.

December 2011

DTMB was officially adopted as an international DTT standard designated as system D by ITU.

2012

The preliminary DTMB network was completed in China.

DTMB 1st Generation Standard

In Recommendation ITU-R BT.1306-6(10/2011) and Recommendation ITU-R BT.1368-9(12/2011), DTMB (System D) is ranked as a suitable system under a number of performance requirements.

Requirements	Suitable system
Frequency usage efficiency	A or D
Power usage efficiency	A or D
Anti-jamming	B, C or D
SFN	B, C or D
Mobile receiving	B, C or D
Handheld TV	C, (E-DTMB)
Anti-home appliance interference	A or D

Cost-effectiveness	Excellent	Better	Good	Bad
Overlay network cost	D	A	C	B
Transmitter	D	B	C	A
Receiver	D	B	A	C

DTMB Advantages

The following are some advantages of DTMB.

• More Content Capacity

Capable of increased frequency (spectrum) efficiency of 10% for a given broadcast system under the same transmission conditions.

• Higher System Stability

DTMB takes pseudo-random noise to fill the guard interval and this pseudo-random noise can also be used for channel synchronisation and estimation, so that the utilisation efficiency of the system frequency spectrum is increased 10% and the system obtains 20dB and above synchronous protection gain.

• Better Mobile Performance

Doubled channel estimation speed, shorter signal capture delay and single antenna meet mobile receiving requirement for HDTV.

• Wider Coverage

3dB improvement on SNR required.

Following is a comparison of first generation DTT technologies.

	ATSC	DVB-T	ISDB-T	DTMB
Bandwidth	6MHz	6,7,8MHz	6MHz	8MHz
Constellation	8VSB	DQPSK QPSK 16QAM 64QAM MR-16QAM MR-64QAM	DQPSK QPSK 16QAM 64QAM	64QAM 32QAM 16QAM QPSK 4QAM-NR
Modulation	8-VSB	C-OFDM	BST-OFDM	TDS-OFDM
Carrier Number	Single Carrier	1705 (2K mode) 68917 (8K mode)	5.6MHz: 1405(2K mode) 5617(8K mode) 432KHz: 109(2K mode) 433(8K mode)	C=1 or C=3780
Interleaving	Time	Frequency	Time & Frequency	Time & Frequency
Multiplex	MPEG-2 system	MPEG-2 system	MPEG-2 system	MPEG-2 system
Video Compression	MPEG-2	MPEG-2	MPEG-2	MPEG2, H.264, AVS
Audio Compression	Dolby AC-3	MPEG-2, DolbyAC-3	MPEG-2, AAC	MPEG2, AAC
Bit rate (Mbps)	19.39	4.35-31.67	5.6MHz: 3.68-21.46 432KHz: 283-1.65K	4.813-32.486

	ATSC	DVB-T	ISDB-T	DTMB	SBTVD
Excellent	46.34%	56.10%	75.61%	92.68%	63.41%
Good	19.51%	29.27%	21.95%	0%	12.20%
Regular	9.76%	7.32%	2.44%	2.44%	9.76%
Poor/bad	21.78%	7.32%	0%	4.88%	14.64%

Testing in Peru

REMARK	ATSC	DVB-T	ISDB-T	DTMB	SBTVD
Excellent	24.39%	39.02%	41.46%	65.85%	43.90%
Good	2.44%	26.83%	19.51%	12.20%	14.63%
Regular	17.07%	12.20%	9.76%	2.44%	9.76%
Poor/bad	53.66%	21.95%	29.27%	19.51%	31.71%

Peru's National Digital TV Committee, Oct-Dec, 2008

- Lima HDTV test – Antenna Conejo
- Lima HDTV test – Antenna Yagi

Testing in Cuba

Chinese DTMB receiver has the best sensitivity and anti-jamming capability.

-Cuba's National

Fixed Receiving	DVB-T	ISDB	DTMB	Draw
Win	1	0	67	2
Winning Rate	1.4%	0.0%	95.7%	2.9%

DTMB-A (DTMB Advanced)

DTMB-A is the advanced standard of DTMB. In July 2015, DTMB-A was officially adopted as an international DTT standard where it was designated as system E of ITU.

In 2009, the national standards committee carried out the digital television's meeting of the leading group of national spirit, to arrange the inspection of public welfare related to industry special scientific research projects. The DTMB national standards revision and international standards are a project responsibility of Tsinghua university on the basis of national standard DTMB key technology breakthrough, achieved to complete the lab software simulation system and key technology of hardware verification platform to develop. Tests showed that system performance index is better than that of DVB-T2, forming the terrestrial digital TV standard scheme of evolution (DTMB Advanced, DTMB – A), maintaining completely independent intellectual property rights. Digital TV national engineering laboratory (Beijing) standard DTMB industry chain enterprises now have organised DTMB-A test prototype research and development. In January 2012, the DTMB-A system test prototype was completed. It supports a fixed receive transmission rate that is close to 40 MBPS, mobile receives the transmission rate of 20 Mbit/s. In comparison to DTMB, the terrestrial digital TV receiver general specification under complex multipath channel receiver SNR threshold improved more than 1.5

dB. The digital television national engineering laboratory (Beijing) demonstrated a system capable of simultaneous transmission of 4-way HDTV programs in an 8MHz channel.

DTMB – A standard is adhering two basic principles; “inherit and develop existing core technology” and “innovation and performance paying equal attention to, adherence to independent intellectual property rights”. The comprehensive promotion of digital TV system transmission performance, fully expand the application field of digital TV system from the two different aspects. It is to improve spectrum efficiency, receive threshold, single frequency network, anti-multipath capability and high speed mobile receiving main performance indexes, such as to make it reach or exceed the DVB-T2 standard, continue to occupy technology commanding heights, all-round support high-definition digital television terrestrial broadcasting, high-definition, standard definition, mobile TV, radio, Internet data bidirectional interaction, etc.

Major technical features of DTMB-A include: A new flexible frame structure that significantly reduces the complexity and power consumption of the receiver, and flexible support for multiple businesses. It supports 256QAM/256APSK high order modulation, which makes the frequency of the digital TV transmission evolutionary system more obvious than the existing national standard DTMB. Based on the modulation system of Golay-APSK that improves the efficiency of the spectrum while improving the performance of error control and ensuring the reliability of transmission. The new LDPC code further reduces the noise ratio threshold. The multi-antenna emission diversity gain, which can eliminate the influence of “artificial multi-diameter” in traditional single-frequency network system leads to better signal coverage. Based on the range and location algorithm of time-frequency 2-D signal processing, the high precision and low complexity wireless positioning algorithm is realised in the optical distance condition.

Simulation of DTMB-A/DVB-T2 Standard

System Parameter	DVB-T	DTMB	DVB-T2	DTMB-A
GI(μs)	224-7	125-56	532-7	68-34
Transmission rate(Mbps)	4.98-31.67	4.81-32.49	5.35-50.4	6.63-51.23
AWGN (C/N)	64QAM, 2/3 code rate	18.6dB	15.6dB	14.8dB
	QPSK, 1/2 code rate	4.7dB	1.9dB	1.0dB
64QAM, 2/3 code rate ITU V-A	Fd:0Hz (C/N)	20.5dB	19.6dB	17.2
	Fd:10Hz (C/N)	N/A	21.0dB	18.9
	Fd:100Hz (C/N)	N/A	23.5dB	20.1dB
Data acquisition	About 100ms	About 5ms	Slow	Fast
Expansion No Positioning	Yes	Yes	Yes	

Comparison testing of DTMB-A/DVB-T2 Standards

Modes	DTMB	DVB-T2		DTMB-A	
	64QAM	Mobile reception mode	Fix reception mode	Mobile reception mode	Fix reception mode
Payload Rate	24.3	23.8	38.6	24.3	38.8
AWGN(dB)	14.9	13.0	18.8	12.4	18.3
Ricean(dB)	15.5	13.6	19.2	13.0	18.8
Rayleigh(dB)	18.2	15.7	21.9	15.6	21.5
Pre. Test	DTMB-A is better than DVB-T2 on 64QAM mobile reception				

The simulation results show that in spectrum efficiency, receive DTMB – A threshold, single frequency network, anti-multipath capability and high speed mobile receiving such main performance indexes reach or exceed the DVB-T2 level. The current digital TV transmission evolution system DTMB-A prototype, in the 8MHz broadcast band, the data rate can be 38.7 Mbit/s. Stable mobile receive codes can reach 23Mbit/s. The receiving threshold for the second generation of terrestrial digital TV transmission standard DVB-T2 is required under the same transmission rate. The receiving performance under high-speed moving conditions is also much better than that of DVB-T2.

author

Dr Kong Bin

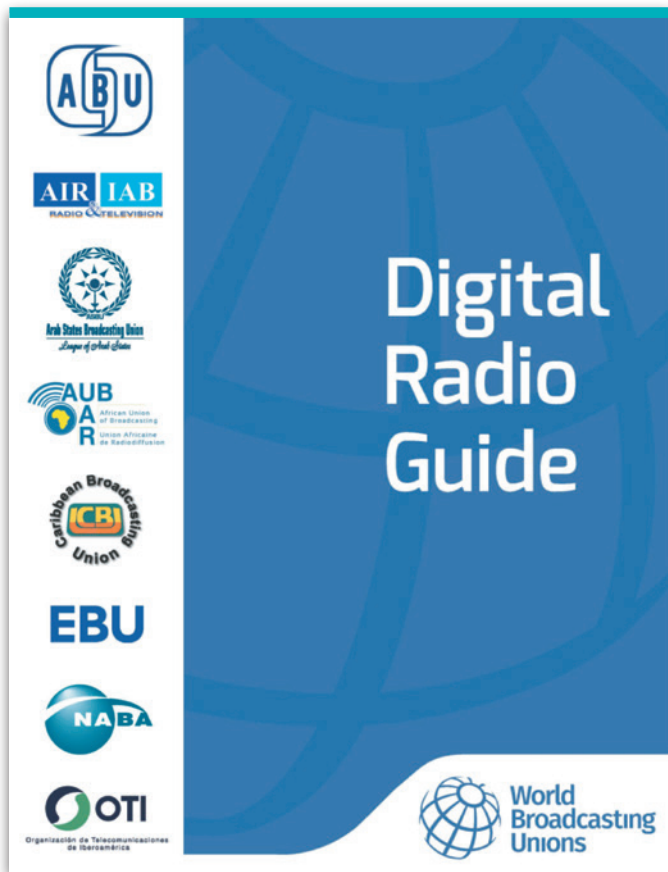
Vice-Chairman of ABU Technical Committee,

Ph.D./Operation Director/Senior Engineer

Academy of Broadcasting Planning, SAPPRFT, PRC

Radio and Television of the People's Republic of China (RTPRC-China)

Kong Bin received his Ph.D. in Communication from Renmin University of China. Dr. Kong is a senior engineer of the Academy of Broadcasting Planning, State Administration of Press, Publication, Radio, Film & Television, and People's Republic of China. He also received his master's degree in Management at Xi'an Jiaotong University in 2005. His research interests have focused on Audio & Visual new media, Digital TV etc. and has contributed over 40 articles to leading broadcasting journals.



The World Broadcasting Unions have released a Digital Radio Guide. This guide contains technical descriptions of four digital radio broadcasting technologies; viz. DAB/DAB+, DRM, HD Radio and ISDB-Tsb.

This publication was edited by Dr AMAL Punchihewa, Vice Chairman of World Broadcasting Unions Technical Committee.

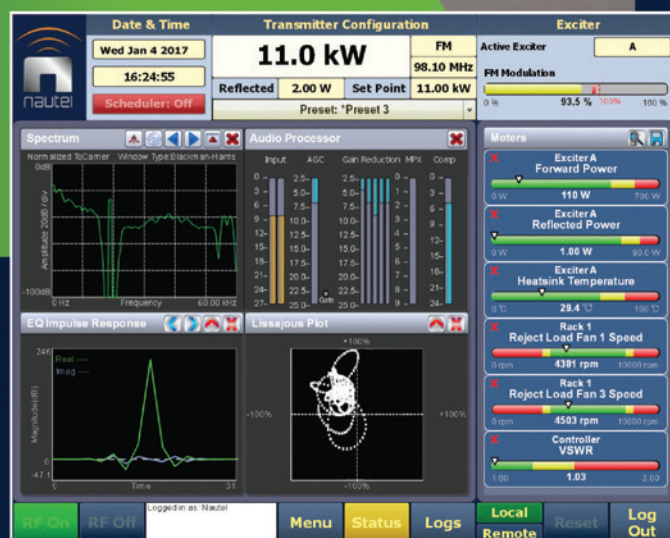


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Member Profile

Accelerating Convergence and Upgrading Radio and Television Convergence in China

1. China has made Extraordinary Advances in the Radio and Television Sector, with New Media Developing at a Rapid Pace

China has 2,564 radio and broadcasting agencies, launching 2,940 radio frequencies and 1,337 TV channels. The number of cable TV and digital TV users in China is 236 million and 197 million respectively. Digital switchover of cable TV has been realized at the county-level cities and above. 337 cities have launched terrestrial digital TV services. The total number of DTH users exceeds 100 million. The comprehensive population coverage rate of radio and television services has reached 98.17 percent and 98.77 percent respectively.

There are 605 licensed online audio-visual content providers in China. It is now home to more than 160 million Internet TV users and over 100 million IPTV users.

2. Media Convergence and New Media Platforms

At present, radio, television and Internet services in China have been further converged. The boundaries between traditional and new media have been broken through one-for-all news gathering, diversified production and multi-platform broadcasting. Cloud platform and services are becoming the first-choice for supporting media convergence, which enables the integration of production procedures, resource sharing and convergence of media content and products. The integrated broadcasting and monitoring platform, underpinning business operation and media services, has ensured distribution models to meet customized demands.



China is vigorously pushing forward the building of cloud platforms for program production and broadcasting services. On top of that, efforts have been made to innovate production, transmission, services and management pattern of media convergence. We strive to put in place the media cloud and big data application platform to offer radio and television services in a more innovative and socialized way anywhere anytime, thus driving the upgrading and transformation of the broadcasting industry.

To this end, China Central Television (CCTV), the Shanghai Media Group (SMG) and Hubei TV are among the Chinese broadcasters having made remarkable progress in the establishment of new media platforms.

Special Zone by CCTV. This is a comprehensive platform that offers a selection of CCTV top-quality programs to mass TV audiences through various forms with set-top boxes. This service is available in China's 18 provinces and autonomous regions, covering over 100 million users. For the next steps, CCTV Special Zone will focus on 4K video on-demand (VOD) and multi-screen interaction services.



@ Radio by SMG. @ Radio serves as an integrated radio program production platform featuring diversified news resources gathering, production and cross-media distribution. It meets SMG's needs for the upgrading of radio program production procedures and the overall transformation of radio services.

Yangtze River media cloud by Hubei TV. This platform for media convergence covers regions along the Yangtze River and provides technical support to media agencies at the provincial, municipal and county levels through a technological framework based on cloud computing. By upgrading the whole process of early-stage news planning, gathering, editing, reviewing, distributing and monitoring, the platform makes one-for-all collection of news resources, diversified production and multi-platform broadcasting



possible. Currently, 117 cloud-based client terminals have been launched, which can provide 152 kinds of public and social services in 58 categories.

3. Enhanced Transmission and Coverage Capacity with More Standardized and Intelligent Terminals

At present, China endeavors to enhance the integration of 31 provincial-level cable TV networks. On May 31, 2016, the national inter-connectivity platform of cable TV network was officially launched for trial operation. We also initiated a nationwide project for digital terrestrial coverage of TV and radio programs, which will set up a digital terrestrial coverage network transmitting 12 national TV channels and three national radio channels. At the same time, local cable TV network companies in Guizhou city, Chongqing municipality and Gansu, Guangdong and Shaanxi provinces have carried out technical tests for integration of cable and wireless networks and expanded new models of convergence that support two-way wireless transmission of cable TV networks and interactions of terrestrial radio and television services.

State Administration of Press, Publication, Radio, Film and Television (SAPPRFT) of the People's Republic of China is advancing the application of the smart television operating system (TVOS) in cable, wireless, satellite and Internet terminals, etc. TVOS is aimed at making set-top boxes, all-in-one devices, media gateways and other receiving terminals more standardized and intelligent. Now Shanghai, Jiangsu, Hunan, Zhejiang, Shaanxi and other provinces have conducted trial application of TVOS and developed more than two million users. The industrialization of TVOS has been actively progressing, including design and manufacture of chips, production of system equipment and intelligent terminals. It has been upgraded from version 1.0 to version 2.0. Continuous R&D will be made to innovate TVOS.



4. Progress in HD services

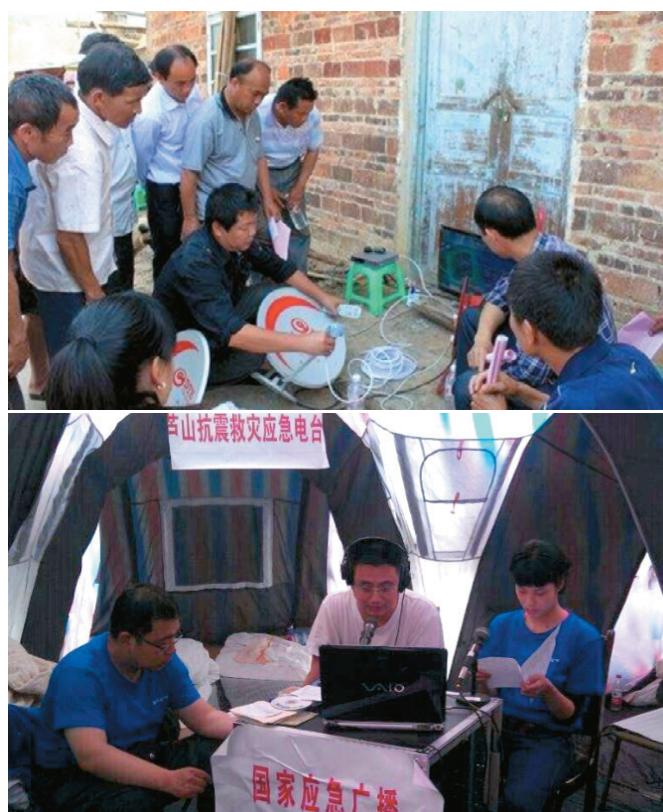
China has now opened a total of 130 high-definition channels. By moving to a new headquarters, CCTV has realized HD in production and broadcasting. TV stations

in Beijing, Shanghai and Hunan have taken the lead in providing high-definition production and broadcasting of most of their channels. Stereo televisions and 4K ultra-high-definition television technology has entered the trial stage for application. CCTV has joined hands with six TV stations in Beijing, Shanghai, Tianjin, Jiangsu and Shenzhen to launch China's first stereo TV test channel. Some of them have started the exploration of establishing 4K ultra-high-definition television production systems.

As planned, China will switch off its standard-definition TV channels by 2020, and high-definition channels will become the mainstream broadcasting mode. CCTV and competent provincial-level TV stations will explore the establishment of 4K ultra-high-definition television production systems. A 4K ultra-high-definition television OTT platform will be put in place to build a system blending both high-definition and 4K ultra-high-definition television programs by 2018. It is expected that 4K ultra-high-definition TV test channels will be launched by 2020.

5. Radio and Television Public Services

The Chinese government has made great efforts to improve the broadcasting public service system. By using DTH technology, we have achieved new breakthroughs to make radio and television public services available in households of villages in rural areas. Based on research on a standardized system and key standards of emergency broadcasting, a national emergency broadcasting center has been established in China National Radio (CNR) and has completed the docking with the national Early-warning Information Center. Its new media platform has been put into operation. The emergency broadcasting mechanism features functions of early-warning information production, broadcasting, distribution and automatic monitoring.



Getting hands on with DAB+ digital radio in Kuala Lumpur

Thirty three delegates from eleven countries took part in the 3rd annual DAB+ digital radio workshop in Kuala Lumpur on 10-14 July. Jointly hosted by the Arab States Broadcasting Union (ASBU), Asia-Pacific Broadcasting Union (ABU), Asia-Pacific Institute of Broadcasting Development (AIBD) and WorldDAB, the five-day event built on previous successful workshops and covered the latest advances in DAB+ technology.

Dr Amal Punchihewa, Director, ABU Technology welcomed delegates to the workshop which included presentations from Alex Ng of Gates-Air on transmitter technology, Albert Tseng from Keystone Semiconductors on receivers, as well as proxy presentations from Factum Radioscape and All In Media.

Technical sessions

Sessions covered a wide range of topics from a practical perspective to provide delegates with the tools necessary to plan and deploy DAB+ networks, from regulation and policy through to network design and construction. Speakers provided an overview of DAB+ and alternative delivery methods, including IP/4G and hybrid radio which combines broadcast radio with IP. Other topics included basis sampling and audio coding theory, DAB features, head-end and transmission system structure, RF planning, network planning and field testing.

The workshop featured a practical group exercise, where delegates were asked to plan the DAB+ rollout for a fictitious country, including aspects of transmission, networking, services, regulation and timelines. Three groups engaged in a multi-cultural setting and enthusiastically undertook the challenge.

Exercise outputs were presented back and showed that everyone had obtained a clear understanding of the material presented, keen to move forward and apply their new knowledge to the planning and deployment of DAB+ in their own countries.

DAB+ continues to go from strength to strength, with new countries across Asia Pacific and Europe setting up networks and trials. Receivers are available for as little as \$16 with more and more broadcasters realising the commercial opportunities that DAB+ enables.

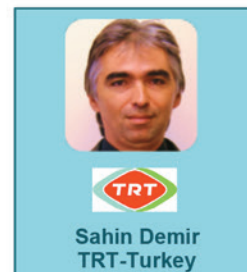
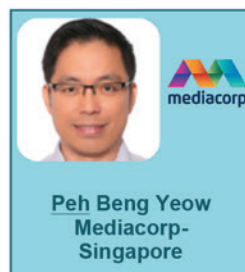
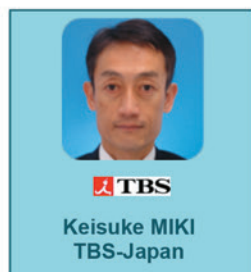
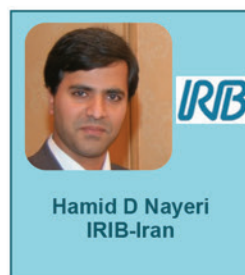
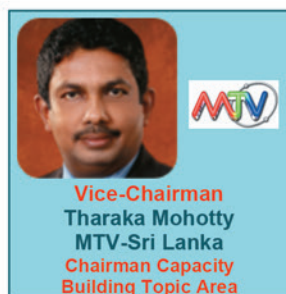
DAB+ workshop in Jordan

The next DAB+ digital radio workshop will take place in Amman on 23-24 August 2017 in partnership with ASBU, JRTV and TRC Jordan. JRTV and commercial radio stations will be on air via DAB+ during this workshop.

To find out more about the Jordan workshop or DAB+ in general, contact the WorldDAB Project Office at projectoffice@worldadab.org.



ABU TECHNICAL BUREAU 2016/2018





54th ABU
GENERAL ASSEMBLY
& ASSOCIATED MEETINGS
Chengdu, Sichuan, China
30 October - 4 November 2017

ABU Technical Committee Meeting

31 October-1 November 2017 • Chengdu, Sichuan, China

PROGRAMME

Room 3, Crystal Hall, Floor 5

Day 1 Tuesday, 31 October

09:00 – 10:30

1. Opening Session

Welcome address
Chairman,
Technical Committee

Mr Masakazu Iwaki
Head of Human Interface Research Division
Science and Technology Research Laboratories, NHK-Japan

Welcome address

SAPPRFT / RTPRC-China

Opening Address

Dr Javad Mottaghi
Secretary-General, ABU

Announcement and Presentation of the 2017 ABU Technical Review Prizes and Engineering Awards

Announcements

Dr Amal Punchihewa
Director Technology & Innovation, ABU

Engineering Awards

Presented by

*Technical Review Prizes
Commended Articles
& Best Article*

Mr Ding Wenhua
Chief Engineer, China Central Television & the Chinese
Academy of Engineering, RTPRC-China & Honorary Vice-Chairman
ABU Technical Committee

Green Broadcast

Mr Hamid Dehghan Nayeri
Director, International Technical Affairs, IRIB-Iran
Panel Chairman, ABU Industry & Green Awards

Industry Excellence

Dr Javad Mottaghi
ABU Secretary-General

Developing

SAPPRFT / RTPRC-China

Broadcast Excellence

Mr Masakazu Iwaki
Head of Human Interface Research Division
Science and Technology Research Laboratories NHK-Japan,
Chairman ABU Technical Committee Panel Chairman,
ABU Broadcast Excellence and Developing Broadcasters' Awards

Session Chair: Mr Masakazu Iwaki
NHK-Japan and Chairman, ABU Technical Committee

2. Confirm Agenda and TC-2016 Proceedings and appointment of Rapporteurs

3. Technological Inspirations:

3.1 Title TBP

Dr Peter Siebert, Executive Director, DVB Project Office, DVB

3.2 Virtual Reality – VR

Korean Broadcasting System

3.3 Tokyo 2020 Olympics and UHD-2 NHK

Mr Atsushi HARUGUCHI, Head of Engineering Administration Department
Deputy Director-General of Engineering, NHK

10:30 – 11:00 **Tea, coffee & networking**

11:00 – 12:30

4. Director's Report

5. Bureau Proposals

6. WRC-19 Preparations

Mr Pham Hai, Counsellor ITU-R Study Group 6, Radiocommunication Bureau ITU

12:30 – 14:00 **Networking lunch**

14:00 – 15.30

Session Chair:

Mr Tharaka Mohotty

MTV-Sri Lanka and Vice-Chairman, ABU Technical Committee

7. Strategic Issues:

7.1 IP for Media – Standards and Interoperability

Mr Paul Treleven, Technical Consultant, IABM

7.2 Cyber Security

Mr John Lee, Vice-President, North American Broadcasters Association

7.3 EBU-flow

Mr Simon Fell, Director Technology & Innovation, European Broadcasting Union

7.4 DTMB Technology Evolution and Promotion

Dr Li Leilei, Professor, Academy of Broadcasting Planning
Radio and Television of the People's Republic of China (RTPRC-China)

7.5 Digitalisation of Broadcasting

Mr Mohammad Rohanudin, President & Director, Radio Republik Indonesia

15:30 – 16.00 **Tea, coffee & networking**

16:00 – 17:00

Session Chair:

Mr Hamid D Nayeri

IRIB-Iran and Vice-Chairman, ABU Technical Committee

8. Members' Present:

8.1 Radio on TV

Mr CW Leung, Head/Engineering, Radio Television Hong Kong

8.2 Integrated China Digital Radio (CDR) System

Mr Gao Peng, Director, Academy of Broadcasting Science of SAPPRFT

8.3 Mediacorp New Campus

Mr Peh Beng Yeow, Vice President, Mediacorp-Singapore

8.4 Emergency Warning System (EWS)

Mr Anoop Kumar Pandey, Rep of DVB, Senior Chief Engineer, Samsung India

8.5 MPEG-H Interactive and Immersive Audio for Broadcasting

Mr Toni Fieldler, Director APAC, Fraunhofer Institute for Integrated Circuits

8.6 5G in Broadcasting and Media

Dr Fares Lubbadah, Owner, Director General, SpaceTech TV Engineering

8.7 Title TBP

Mr Abdelrahim Suleiman, Director General, Arab States Broadcasting Union

17:00 – 17:30

9. Networking with Technical Liaison Officers

Day 2 Wednesday, 1 November

09:00 – 09:30

- 10. Keynote Presentation:** **CCTV Media Integration Practice**
Mr Mei Jianping, RTPRC-CCTV

09:30 – 10:30

11. Technology Panel:

Theme: **Media4All**

Moderator: **Dr Amal Punchihewa**, Director Technology & Innovation, ABU

Panel Team

Mr Masakazu Iwaki, Chairman, ABU Technical Committee

Mr Abdelrahim Suleiman, Director General, Arab States Broadcasting Union

Mr Simon Fell, Director Technology & Innovation, European Broadcasting Union

Mr John Lee, Vice-President, North American Broadcasters Association

Dr Peter Siebert, Executive Director, DVB Project Office, DVB

10:30 – 11:00

Tea, coffee & networking

11:00 – 11:40

12. Summary from Topic Area Chairmen

Production

Mr Kazim Pektas, Chief Engineer, TRT-Turkey

Transmission

Dr Narichika Hamaguchi, Senior Manager, NHK-Japan

Capacity Building

Mr Tharaka Mohotty, Director Engineering, MTV-Sri Lanka

Spectrum

Dr Li Leilei, Professor, Academy of Broadcasting Planning, RTPRC-China

11:40 – 12:30

13. New in Radio Study Groups, Standards and Implementations

13.1 CODECS and Royalties

Mr Alexander Zink, Fraunhofer Broadcast Applications

13.2 ETSI – DRM/DAB+

Mr Lindsay Cornell, Principal Systems Architect, British Broadcasting Corporation

12:30 – 14:00

Networking lunch

14:00 – 15:00

14. The Host Presents

Media Convergence

RTPRC-China

Moderator:

Mr Ding Wenhua

Chief Engineer, China Central Television & the Chinese

Academy of Engineering, RTPRC-China & Honorary Vice-Chairman

ABU Technical Committee

Presenters:

14.1 TV Operating System (TVOS) for Smart IBB Terminals

Mr Sheng Zhifan, Chief Engineer, Academy of Broadcasting Science of SAPPRFT

14.2 CCTV 4K UHD TV Technology Practice

Mr Wang Pei, RTPRC-CCTV

14.3 Shanghai Radio Integration Media Production Exploration Road Change, from Media Convergence Production Start

Mr Zhang Shenwei, RTPRC-SMG

15:00 – 15:30

15. New Recommendations & Decisions of the Technical Committee

Session Chair:

Mr Masakazu Iwaki

NHK-Japan, Chairman, ABU Technical Committee

15.1 Subtitling

15:30 – 16:00 **Tea, coffee & networking**

16:00 – 17:30

16. Updates from Status Reports

17. Useful to know:

17.1 New Members

17.2 Updates from Sister Unions & Intl Organisations

AIBD – Mr Utpal Kanti Mandal

Programme Manager-Broadcast Engineer Asia-Pacific Institute for Broadcasting Development.

ASBU, EBU, WorldDAB, DRM, DVB, IABM, NABA, ITU, etc.

18. Any Other Matters

Session Chair:

Mr Masakazu Iwaki

NHK-Japan, Chairman, ABU Technical Committee

Announcements of Upcoming ABU Events:

ABU Media Summit on Climate Change and DRR & Pacific Media Partnership 2018

Ms Tupoutua'h Latianatoba Baravilala

Principal Legal Officer

Office of the Attorney-General and Ministry of Communications, Fiji

ABU Digital Broadcasting Symposium 2018

Mr Ahmed Nadeem, ABU Technology

Appointment of Hon Vice-Chairman from Host of the 2018 ABU General Assembly and Associated meetings.

19. Closing

New Members

Additional Full Members

Power House Ltd – Sri Lanka

Power House Limited is a broadcasting organisation based in Colombo, Sri Lanka and comprises one TV station (TV Derana) and one Radio station (FM Derana).



TV Derana is a Free-to-air Terrestrial Television channel, which was launched on 11 October 2005. The channel is also available as a digital medium through Dialog Satellite television and SLT PEO TV. Its mission is to be the premium Sinhala entertainment channel upholding Sri Lankan values. TV Derana broadcasts 18 hours a day from 6am with back-to-back entertainment and news content. The channel has expanded its reach to a country-wide coverage of over 95% of its target groups, via five sub-stations.

FM Derana is a Sinhala language FM radio channel, launched on 29 March 2009 extending the promise of 'Embracing novelty while upholding values' to the Sri Lankan radio industry.

Tuvalu Broadcasting Corporation (TVBC)

Tuvalu is a small archipelago in the Pacific Islands with a population of about 11,000 people. It has two national radio networks, comprised of AM Radio network covering all Tuvalu Islands and the FM radio covering the capital Funafuti. Through its two radio channels, TVBC delivers comprehensive programmes and services which reflect the interests of the people of Tuvalu. There is no television on the island and all programmes are broadcast in English and Tuvaluan.



The public broadcaster is committed to delivering innovative, entertaining and trustworthy programmes and services to the population. TVBC wants to strengthen their presence on different platforms. They are presently working on different projects, such as the improvement of Internet connectivity, the introduction of television and the revival of some publication projects.

In its Strategic Plan 2017-2019, TVBC reiterates its commitment to prioritising learning and development activities. They are presently empowering and training their staff to face the challenges and opportunities of the changing media environment.

Affiliate Members

Apalya Technologies-India joined ABU

Apalya Technologies Private Limited is based in Hyderabad, India. It was founded in 2005 to take advantage of the growing demand for live television events and video-on-demand in the mobile space.



Apalya Technologies Private Limited provides video streaming managed services to telecom operators, handset manufacturers and content owners in India and most recently in Sri Lanka and Indonesia. It offers Myplex, an entertainment service that offers on-demand and live TV content across a selection of Hollywood and Indian movies, TV shows, video clips, and trailers, as well as a selection of live TV channels and other entertainment-related content.

As of December 2015, Apalya Technologies Private Limited operates as a subsidiary of U Digital Content Private Limited.

Pathshala-Bangladesh

Pathshala South Asian Media Institute (Pathshala) started its operations in 1998 with its Department of Photography, which is recognised as an institution offering the highest quality education in photography currently available in Bangladesh.



On 22 March 2010, Pathshala South Asian Media Institute launched its Department of Film and Television (OFT). This department offers a wide range of professional courses in TV Production, TV Reporting, TV Program Presentation, Video Editing, Cinematography and Camera Operation, Filmmaking, Graphics and Animation, Film and Television Acting and a yearlong course for a Diploma in Film and Television.

Drik is a sister concern of Pathshala South Asian Media Institute. Established in 1989, its major areas of expertise are advocacy, awareness campaigns and the production of communication material.

HANDS ON Experience in Digital Radio



The third (3rd) regional workshop on Digital Radio Broadcasting, a collaboration between Asia? Pacific Broadcasting Union (ABU), Arab States Broadcasting Union (ASBU) and WorldDAB, was held at the AIBD training premises in Kuala Lumpur, Malaysia from 10 to 14 July 2017. The event was hosted by AIBD for the second time and jointly organised by four organisations. The five-day course covered most of the technical fundamentals of Digital Radio.



Thirty three participants from eleven AIBD and ABU member countries attended the workshop, which including some participants from Arab states via ASBU.

The five-day event built on the success of previous workshops hosted by AIBD and covered the latest advances in DAB+ technology. Fifteen sessions covered a wide range of topics from a practical perspective, to provide delegates with the fundamental principles and concepts in DAB+ technologies as the tools necessary to plan and deploy DAB+ networks.



Mr Chang Jin, Director of AIBD, Dr Adnan from ASBU and Dr Amal Punchihewa, Director, ABU Technology and Innovation, welcomed delegates to the workshop. Presentations from Alex Ng of Gates-Air, on transmitter technology and from Mr Albert Tseng from Keystone Semiconductors, on receivers, together with proxy presentations from Factum Radioscape and All In Media, augmented presentation of Dr Les Sabel and Dr Amal. On the first day of the workshop, Dr. Amal Punchihewa from ABU gave brief information about analogue to digital conversion, as well as a brief introduction to audio compression and audio codecs.

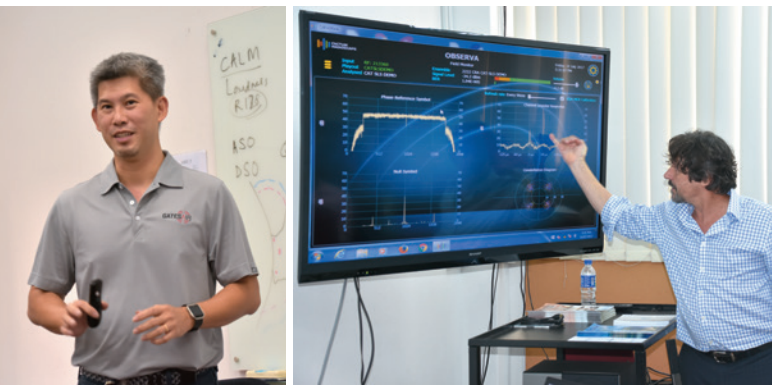
The workshop featured a hands-on group exercise in which delegates were asked to plan the DAB+ rollout for a fictitious country of their making. The plan needed to include aspects of transmission, networking, services, regulation and timelines.



The exercise outputs were later presented and showed that everyone had obtained a clear understanding of the material and were keen to move forward and apply their new knowledge to the planning and deployment of DAB+ in their own countries.

There were a number of speakers over the next four days. Dr. Les Sabel from World DAB talked about DAB+, with its structure, current transmission technologies and architecture. He further explained about the PAD deliver systems and different types of receivers.

Mr Alex Ng from Gates Air explained what makes DAB+ environmentally friendly, including power consumption and efficiency, space and environment, capital and operating costs; making relevant comparisons with FM.



There was a separate session for RF coverage, including a spectrum and regulation overview, coverage planning, propagation, RF network design, single & multi-frequency networks and RF interference. Participants also learned how to plan, design and implement a digital radio network.

The responses of the participants were extremely positive and encouraging and the following are some of their positive comments.

Most participants expressed their satisfaction rating as “excellent” and “good” for all the relevant topics presented by the four consultants/resource persons, who were clearly well-versed in their respective subject matters.

Based on the resource persons’ evaluations, it was revealed that they were well satisfied with the diverse and interactive response from the workshop participants. The body of participants were considered to be a very good group, based on their active participation with multiple individual and group interactions.

Overall the workshop proceeded smoothly without hiccups and almost all participants praised the joint organisers – ABU, AIBD, World DAB+ and ASBU for arranging a very well-conducted and organised workshop, with a high level of support and hospitality.



ABU Technology Webinars Series 2017

This year, the ABU Technology Webinars series was held from 2-25 August 2017. Participation was offered free of charge to ABU members and others in the industry interested in broadcast technologies and their applications.

The webinar sessions were run twice each day with one morning session, repeated in the afternoon. This was to facilitate the participation of attendees from different time zones. Each webinar session was of around 60 minutes duration, starting with presentation(s) on the subject matter by experts, followed by a Question and Answer session.

The webinar sessions were grouped under six main themes, with a total of 36 sessions over 18 days being presented throughout the month long festival. The themes were as follows:

- Digital Radio
- Media Management and Workflow Enhancements
- DTT Implementation and Enhancements
- Advanced Audio Applications
- IP Technologies in Broadcasting
- OTT and IBB Technologies

The ABU Webinar festival received 344 registrations from participants within and outside the region and there was a recorded attendance of 1307 participant-sessions.



Participants from All India Radio are attending the webinar at their station

Pacific Media Partnership Conference (PMPC) 2017

HONIARA, SOLOMON ISLANDS

15th-17th August, 2017 • PMPC-2017 Islanders on Screen

Dr. Martin Hadlow and Dr. Amal Punchihewa



'CONNECTING THE UNCONNECTED' Pacific Broadcaster Commit to Digital Age

Radio and television executives, including other media personnel in the Pacific, have resolved to expand digital broadcasting services to listeners and viewers in their countries across the region. They arrived at this commitment at the 8th Pacific Media Partnership Conference 2017 held in Honiara, Solomon Islands.

The Prime Minister's opening address was delivered by Minister for Communication and Aviation in Solomon Islands, Hon. Peter Shanel Agovaka, MP noted that his Government was "trying to connect the unconnected" in the country. He said that in a large archipelago, such as Solomon Islands where 80% of the people live in small villages, it was a challenge to link the nation to new digital technologies. However, the Minister noted that two important legal instruments, one a national ICT policy and the other a digital broadcasting policy, had already been implemented last year, thus paving the way for a move from analogue to new digital delivery platforms.

Pacific Media Partnership Conference (PMPC) Chairperson, Ms Faiese Lei Sam-Matafeo from Samoa, outlined how broadcasters in the Pacific region faced unique problems and said that they were "hungry for knowledge" to enable them to address key issues. She called for the meeting to be the leader in forging a concrete plan which could address some of the difficulties facing the sector.

In responding to her remarks, Mr Robert Luke Iroga, Chairman of the Board of the host agency, the Solomon Islands



Mr Robert
Luke Iroga

Broadcasting Corporation (SIBC), said that his organisation would listen intently to the conference proceedings as it was facing similar challenges to those being encountered elsewhere.



Dr. Javad
Mottaghi

ABU Secretary-General, Dr. Javad Mottaghi, assured the PMPC of the ABU's assistance with technical advisory services and in other fields of support, such as the provision of radio/TV programme content, broadcast news exchange, training, capacity-building and in legal and copyright matters. The ABU's Director of Technology and Innovation, Dr. Amal Punchihewa, said

that key conference partner the ITU had produced 10 road maps specifically for the PMPC and that these would provide delegates with potential avenues to pursue as they made decisions on digital change.

The conference proceedings were commenced with a case study on digital television in Thailand presented by Col. Dr. Natee Sukonrat, Vice-Chairman of NBTC in Thailand. Dr Natee emphasised digital TV timeline in Thailand and analogue switch-off in 2018. He also presented media market dynamics in Thailand. He said that digital TV total advertising revenue was now over 526b Baht (approx. US\$1b) per annum.



Col. Dr. Natee
Sukonrat

Ms Orasri, Srirasa Divisional Director of Office of NBTC Thailand, presented digital switch-over challenges: pacific



Ms Orasri Srirasa

and beyond representing ITU and ITU-D Study Group. Ms Srirasa outlined what the ITU has done and what it does in the digital transition of broadcast services. She outlined digital switch over (DSO) status in Pacific countries. The ITU-D study group has prepared road maps and handbooks describing practical and essential guidelines in digital migration. These provide comprehensive overviews of strategies and methods of digital migration. She mentioned a subsidy programme for digital terrestrial television receivers and, in concluding her presentation, she summarised the DSO challenges of many nations.

The Minister for Communications and Aviation, Hon. Peter Shanel Agovaka, MP delivered the official speech of the prime minister of Solomon Islands. Delivering the speech, the Hon Minister informed the audience that Solomon Islands has 73-80 dialects and languages. Further, he said that last year, the SI Government (SIG) introduced two policy documents: a national ICT policy and a digital broadband broadcasting policy. The minister had visited Geneva for the WSIS conference this year and would also attend the developing countries conference to be held in Buenos Aires. In 2015 SIG re-joined the ITU. The Government is “trying to connect the unconnected” in the country. Solomon Islands is a large archipelago and it is a considerable challenge to link it. Nearly 20% of the SI population has broadband connectivity with 80% of people living in small villages. Low income per capita and low electricity supply rates can be observed. The Prime Minister holds the broadcasting portfolio in Solomon Islands and is supportive of a digital transition. SIG wants ‘free to air’ TV services to commence as soon as possible. (Currently, only cable TV available.)



Hon. Peter Shanel Agovaka



Dr. Amal Punchihewa

Dr. Amal Punchihewa, Director, Technology and Innovation, ABU provided an introduction to the next session by outlining conference aim and objectives, followed by a brief discussion. Dr. Martin Hadlow, Partner, Consulting Panel Ltd., Australia provided an overview of the difficulties for broadcasting in Solomon Islands.

Each of the Pacific nations was requested to make a short presentation outlining their country report.

The first country report was presented by Solomon Islands. Mr. Wilson Leguvaka, Director, Regulatory Resources, Telecommunications Commission of Solomon Islands (TCSI) outlined challenges in reaching the population of 515, 870. He also provided information regarding the broadcast situation in Solomon Islands, where it is targeted to switch off analogue (ASO) in 2020.

A representative of Ministry of Communications and Aviation spoke on national broadcasting policy and discussed copyright, technical standardisation etc.

Mr. Kila Aluvula, Manager, Special projects, NICTA presented



Mr. Kila Aluvula

the country report of Papua New Guinea. He said that PNG has a 7.7m population. There are three free to air television channels, 5 DTV (pay channels) and 1 MMDS channel. He discussed challenges faced by PNG and some of the solutions. NICTA is getting Ministerial intervention to get ‘free to air’ channels to co-operate on standards. He also said that analogue to digital transition in the Pacific requires Government support. He noted that the Government prioritises social issues (health, education etc.) ahead of the introduction of digital technologies. He suggested that Pacific Governments should decide on common (single) technical standard (e.g. set-top boxes) for the region and collaborate in implementation.

Ms Faiesea Lei Sam-Matafeo, CEO, Samoa Broadcasting Corporation presented the country report of Samoa. Samoa TV had been taken over as a commercial entity by staff and now operates as a business firm. She referred to the poor situation regarding broadcasting in Samoa, due to regulator decisions.



Ms Faiesea Lei Sam-Matafeo

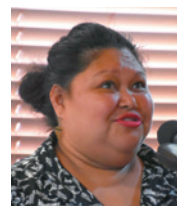


Mr. Loyley Ngira

Mr. Loyley Ngira, OBE, CEO of Solomon Telekom presented on Nexus among Celocs, Telcos and Broadcasters. He said that Telekom is both a broadcaster and a telecommunications provider. Solomon Telekom operates 12 HTV channels and 3 analogue TV channels.

Mr. Teannaki Tongava, CEO, Broadcasting and Publications Authority (BPA), presented country report of Kiribati. He said that SKY Pacific is the only TV cable provider in Kiribati, with an approximate customer base of 200. In Kiribati, one FM station is operated by the Catholic Church. BPA is prioritising the development of a TV service within 3 years.

Ms Maggie Heilan Boyle, Senior Multimedia Journalist, Fiji Broadcasting Corporation presented country report of Fiji. She outlined radio and TV developments and noted that Fiji digital TV operates on a unique technical system, which only allows access through specific models of TV receivers.



Ms Maggie Heilan Boyle



Mr. Francis Herman

Mr. Francis Herman, OAM, Associate, sPASIFIKmedia (and CEO designate of the VBTC).

Presented the country report of Vanuatu. The VBTC faces both funding and equipment problems. Free-to-air (FTA) TV is coming soon to Vanuatu.

During the discussions, Dr Javad, ABU SG mentioned that he had advised the Solomon Islands Minister to put funds into health and educational broadcasting. Mr Mark Rogers, Kordia, New Zealand, suggested a ‘contestable fund’ for programme content production (as in New Zealand) could

be an idea for the Pacific. Ms Srirasa agreed with this. She noted that a similar system operates in Thailand.

Mr. Roland Fung Kwok Pui, APT Satellite Ltd., Hong Kong spoke of Great Wall TV on APSTAR addressing the role of satellite in media delivery for islanders. He said that APT Satellite Ltd. operates 5 satellites from Hong Kong. The footprint of APSTAR-6 covers Solomon Islands and PNG.



Mr. Prasanna Meemaduma

Mr. Prasanna Meemaduma, System Sales Manager, RFS Pty. Ltd, Australia presented 'Planning your Digital TV' with some considerations for roll-out. RFS carries out both digital TV and radio roll-out. He gave examples of 'a typical day on the internet' to highlight the new digital environment. He presented some statistics such as 8.8 billion YouTube videos viewed; 186 million Instagram photos; 152 million SKYPE calls; 2.3 billion GB of web-traffic; 803 million Tweets; 4.2 billion Google searches; 36 million Amazon purchases; 207 billion e-mails sent.

On the second day, Dr. Martin Hadlow, Partner, Consulting Panel Ltd., Australia, presented Media Development in Solomon Islands, Pacific and beyond. He presented a historical overview of wireless and radio development in Solomon Islands, pioneering work using PEACESAT in the Pacific and experiment in Educational TV in Samoa.

In her second contribution to PMPC-2017, Ms Orasri Srirasa, Division Director, DBB, Office of NBTC, Thailand Presented 'Community Broadcasting: Making it Happen in a Digital Era.' She presented an overview of community radio/TV status in Thailand in a digital time. She explained in detail, community TV characteristics, funding patterns, ownership issues etc. -programme content and use of social media. She shared community media slogan: "The power of the crowd is driving the future" with the delegates.

Mr. Ashley Wickham, General Manager, SIBC provided an overview of a recent UNDP funded community radio project, its successes, challenges, current situation while addressing delegates on the topic of Community Radio in Solomon Islands.



Mr. Ashley Wickham

Dr. Javad Mottaghi, Secretary-General said that UNESCO could not be present at the conference. He felt that the UNESCO Office, Apia should have sent a representative. He noted that UNESCO's lack of action was being widely seen in Asia too and this was "absolutely unacceptable".



Mr. Sebastian Tamagken

Mr. Sebastian Tamagken, Manager, Yap Radio Station, FSM presented the country report of the Federated States of Micronesia. The Yap station is known as V6AI Radio. It operates on 1494 kHz with 10KW of power (7am-11pm daily).

Dr. Frederick Ndolu, Board of Radio Republic Indonesia (RRI) presented 'PUBLIC SERVICE BROADCASTING IN THE DIGITAL ERA' He provided a comprehensive overview of

the importance of Public Service Broadcasting (PSB). He explained the difference between PSB and PSM (Public Service Media) and how PSB is under pressure from digital media and other formats. He was critical of UNESCO and its lack of playing the leading role in PSB that it had in the past.

As the host and a long standing broadcaster and media personnel, Mr. Ashley Wickham, General Manager, SIBC presented 'Public Service Broadcasting (PSB) in Solomon Islands.' He outlined the SIBC PSB model. He said that all SIBC staff is now on contracts, not a 'job for life' structure. SIBC is paying for staff members to undertake one unit per semester of study at university in Honiara to help raise their professional skills and educational levels.

Ms Maggie Boyle, Senior Multimedia Journalist, Fiji Broadcasting Corporation presented Women in Media and Gender Issues. She briefed conference on Broadcasting For All: The Pacific Wave. She provided an extensive overview of gender and media issues in the Pacific.

She expressed her opinion that women were under-represented in senior media positions across the region.

Dr. Amal Punchihewa, Director, Technology and Innovation, ABU carried out an exercise to ascertain 'Developmental Needs of Pacific Members: A Way Forward.'

Discussion provided an extensive commentary on possible needs and potential forward progress. It was suggested ABU support human capacity building, spectrum management, programming, DRR/climate change, technical 'know how', training best practice, digitizing archives. Specifically mentioned was ABU's customised technical advice to meet unique individual needs in digital migration. The ABU also offered expertise in sports rights, copyright, market research, media law etc. It was recommended the establishment of a PMPC Task Group to work with the ABU to take matters ahead from PMPC 2017. Mr. Francis Herman was nominated to head the group, but Mr. Wickham requested that Pacific broadcasters meet separately first.

In third day of the conference, Mr. Masakazu Iwaki, Head of Human Interface Research Division, NHK, Tokyo. Japan presented on Digital Broadcasting Technologies: Media for All

He presented a comprehensive overview of an innovative NHK system using computer technologies, especially noting the software available to smaller broadcasters.



Mr. Masakazu Iwaki



Mr. Nils Ahrens

Mr. Nils Ahrens, Regional Broadcast Manager (Asia-Pacific), Rohde & Schwarz, Australia presented on Technology Shaping Media Creation, Processing and Delivery. His presentation provided an extensive outline of current and future technologies. He explained details of how Pacific broadcasters can access relevant equipment and develop technical standards.

The conference was concluded with a panel session titled “Challenges for Broadcasters in Island States: Progress in TV and Sustaining Viable Operations”.

Dr. Martin Hadlow, Partner, Consulting Panel Ltd., Australia moderated the panel session, having ninety minutes of roundtable commentary, questions and answers, comments and views. All conference delegates (especially industry professionals) invited to participate and to speak.

Specific issues of smaller Pacific broadcasters were highlighted and noted by the ABU and Honiara Statement (conference outcome and future needs) discussed by all present, circulated and agreed to by all. Honiara Statement is given at the end of the article.

During the closing ceremony the following the following speakers made quick summaries and acknowledgements.

SIBC Board Chairman, Mr. Robert Luke Iroga.
SIBC General Manager, Mr. Ashley Wickham.
ABU Representative, Dr. Amal Punchihewa.

An invitation was extended by Ms Maggie Boyle, representing the Fiji Broadcasting Corporation, for all delegates to meet again for the PMPC 2018 in Nadi, Fiji (5th-7th February, 2018).

The PMPC, which had the theme ‘Television: Islanders on Screen’, concluded with the adoption of a Honiara Declaration.

HONIARA STATEMENT

PREAMBLE

Radio and television broadcasters in the island nations of the Pacific face specific difficulties and challenges. This is particularly so in the present global environment of technological change and digital disruption. The migration of existing analogue equipment to new international engineering standards and formats is creating a problematic situation for both broadcasting organisations and their audiences alike. The financial cost of replacing and updating transmission and receiving equipment is often prohibitive, while the development of programming content to address new audiences in a mobile, digital landscape requires additional resources often not readily available to small radio and television organisations and operators.

Broadcasting has a vital place in the democratic development in the island societies of the Pacific. The remoteness of nations, scattered across the world's largest ocean, places additional responsibilities on radio and television stations as key components in national cohesion, cultural and linguistic expression, nation-building, out-reach and development. While our cultures are enduring, our traditions strong, and our people creative, entrepreneurial and open to change, the digital age requires us to operate in an expansive new environment which includes a competitive content-delivery framework that is also open to well-resourced global players.

At the Pacific Media Partnership 2017 in Honiara, the Hon. Minister of Communication and Aviation of the Solomon Islands Government invited us to operate as inclusively as possible within the geographical boundaries of our nations and to deliver digital services to even the most remote dwellers and villages. He called on us to “try to connect the unconnected” thus ensuring that the benefits of the new digital world are available to all our citizens.

COMMITMENT

We, the delegates to the Pacific Media Partnership Conference 2017 in Honiara, Solomon Islands thank the Asia-Pacific Broadcasting Union, the International Telecommunications Union, the Solomon Islands Government and the PMPC 2017 hosts, the Solomon Islands Broadcasting Corporation (SIBC) and Solomons Telekom Television (TTV), for initiating this important regional event.

Recognising the outcomes of previous PMPC regional meetings and the theme of PMPC 2017, Islanders on Screen, we reinforce our commitment to the task of providing audiences in all parts of our scattered nations with a range of programme content, news and information, delivered both terrestrially and in digital form, which enables our fellow citizens to more actively participate in the national conversation, to benefit from the human richness which our societies offer, and to enjoy a climate in which freedom of expression thrives.

Following three days of productive, amicable and professionally rich discussions and exchanges in the city of Honiara, Solomon Islands we:

- call upon fellow broadcasters throughout the Pacific to continue to

seek creative solutions to the challenges now facing us all and to embrace the exciting possibilities afforded by new technologies in a digital and mobile age;

- commit ourselves to taking positive and proactive measures in our own organizations in producing quality on-air and digital product to ensure that listeners and viewers in our nations are able to embrace the benefits of digital media and its possibilities;
- seek the support and assistance of regional bodies, such as the ABU, and UN agencies, like the ITU and UNESCO, in fields as varied as human capacity building, spectrum management, digital roll-out, customized technical advisory services, copyright, legal issues, media law, community radio/TV, market research, archiving, programme exchange and international collaboration;
- invite the Working Group established at PMPC 2017 to continue its work in enabling our conversation to continue, thus ensuring that our regional partnership is productive and supportive in a ‘Pacific way’ to enable us to further develop our capacities and capabilities;
- ask the Asia-Pacific Broadcasting Union to (a) broaden its membership in the islands region by inviting all broadcast media to join ABU; (b) ensure our requests for ABU assistance are considered carefully and responded to; and (c) share the benefits of ABU membership across the region equitably.
- encourage governments, civil society, research institutions, international agencies and other parties to develop partnerships with broadcasting organizations in the Pacific to enhance the delivery of professional messages and public information, education and the broader global conversation.

CONCLUSION

We stand as partners and creative entities and are keen and willing to play our role in the international community of nations. We recognize the vast benefits of digital technologies, whether mobile phones, digital radio/TV transmission or social media, and embrace the possibilities afforded. Further, we ask that our Pacific voices, as expressed at the PMPC 2017, be heard on the broader global stage and in major international forums.

To conclude, we invite all broadcasters, stakeholders and fellow interested parties to gather in Nadi, Fiji from the 5th-7th February, 2018 for the next Pacific Media Partnership Conference.

Honiara.
17th August, 2017

The conference was jointly sponsored by the ABU, ITU, Solomons Telekom Television (TTV) and the SIBC. It brought together executives and experts from 14 countries and the proceedings included case studies, country reports and specialist engineering sessions.

The next PMPC-2018 will be held in Nadi, Fiji from the 5th-7th February, 2018.

Judicious Reconditioning of Convoluted Defects in RF Combiner and Diplexer in a High Power TV Transmitter

abstract

Television broadcasting, which uses amplitude modulation for the visual portion of the signal and frequency modulation for the aural portion of the signal, became available to the public in 1959 in India. Digital television (DTV) Transmitters are also under testing at few cities in India. Transistor and MOSFET (Metal Oxide Semiconductor Field Effect Transistor) devices have ushered in the era of distributed amplification, where multiple devices are used to achieve the required RF output power. The power amplifier (PA) raises the output energy of the transmitter to the required RF operating level. Solid-state devices are increasingly being used through parallel configurations in high-power transmitters. Thus RF Combiners become the vital organ of the Transmitter. Further, in Analogue High Power Transmitters the filtered visual and aural outputs are fed to a diplexer where the two signals are combined to feed the antenna. The combiners and Diplexer insert losses in the RF chain. RF insertion loss and VSWR are critical parameters of these passive elements. This article provides discernment of Combiners and Diplexer in the process of repairs carried out in them in a very frugal procedure. This is significant in view of large number of High Power Transmitters in India and other countries.



M. S Duhan

DDG(E), DDG (E), DDM (NZ), Doordarshan India, New Delhi.

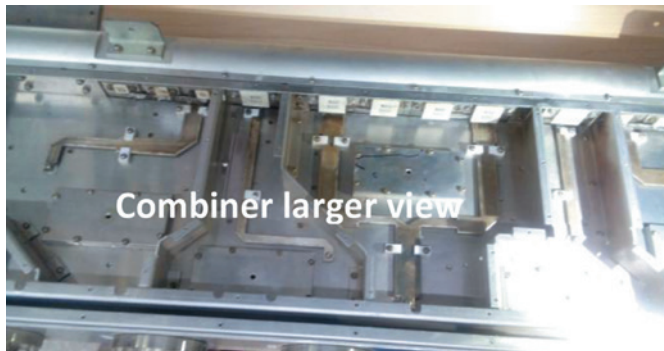


Sh. Satya Pal

DDE, Doordarshan India

RF Combiner

It is an integral and crucial part of a high power TV Transmitter, in which several stages of power amplifiers can be cascaded and made broadband. The individual stages of RF amplifiers need to be coupled together and this must be achieved while maintaining the characteristic impedance of the system. Power combiners are N-port devices used to make a vector sum of $N \times 1$ different signals. The two most common methods of extending the operating power of semiconductor devices are direct paralleling of components and hybrid combining. Application of this simple approach

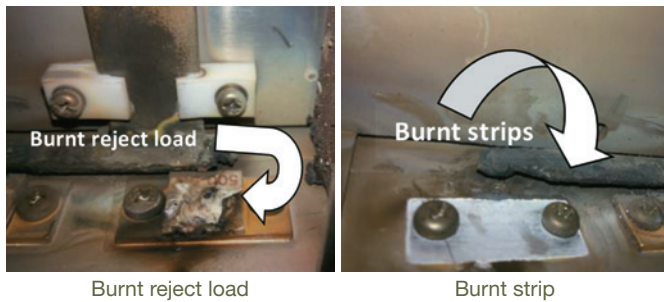


RF Combiner

is limited by variations in device operating parameters. Two identical devices in parallel do not necessarily draw the same amount of current (supply the same amount of power to the load). Paralleling at UHF frequencies and above can be difficult because of the restrictions of operating wavelength. The individual stages of an RF generator must be coupled together. Rarely do the output impedance and power level of one stage precisely match the input impedance and signal-handling level of the next stage.

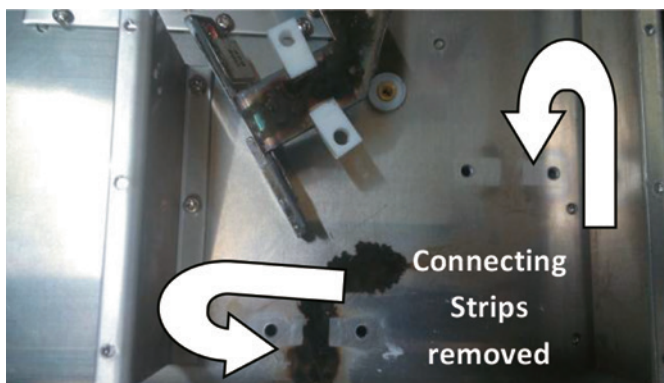
The preferred approach involves the use of identical stages driven in parallel from a hybrid coupler. The coupler provides constant-source impedance and directs any reflected energy from the driven stages to a reject port for dissipation. A hybrid coupler offers a voltage standing wave ratio or VSWR-canceling effect that improves system performance. Hybrids also provide a high degree of isolation between active devices in a system.

There is a requirement, therefore, for broadband matching circuits. Matching at RF frequencies can be accomplished with several different techniques. Generally, a combiner can be categorized as branched (star point) or balanced (constant-impedance). These types may use band-reject (notch) or band-pass filters. The pros and cons to each



type of combiner system are numerous. Combiners may fail due to various reasons, like unequal phase and amplitude of power amplifiers, mismatch of impedance resulting high VSWR, vibrations, high humidity etc.

One such RF Combiner, in a 20 kW UHF TV Transmitter at Karnal (Haryana) was burnt. This transmitter consists of 12 Power Amplifiers, each of 2 kW, and it has two combiners. The first combiner has 8 input ports and one output port, while the other combiner has 4 input ports and 1 output port. There is a third combiner which combines output of both of these combiners. The 1 kW reject load associated with the final combiner was getting heated up, because of mismatch in RF Power of Power Amplifiers.



Removal of connecting strips

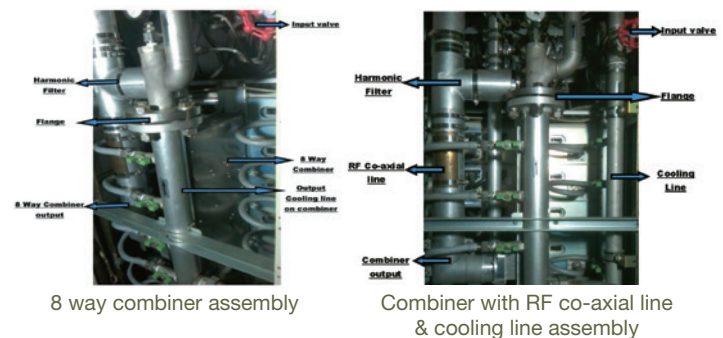
The 8 Way combiner had more damage in its connecting strips and 50 Ohm 800 W terminators, while in the 4 way combiner; only 50 Ohm 500 terminators were burnt. So it was planned to make a judicious reconditioning attempt locally by the team from O/o ADG(NZ) and HPT Karnal, as **the cost of a new combiner is about Rs. 62 Lacs**. The first challenge was fabrication of the connecting strips locally. This was fabricated with copper alloys with 2% Beryllium and outer surface was silver coated with dimensions exactly matched to the original.

The 50 Ohm 800 W resistors and 50 Ohm 500 W resistors were also procured. The combiner was cleaned and the connecting strips and load resistors were fitted properly. Procedure and steps of opening and fitting of the combiner: As the combiner assembly of the transmitter is water cooled the cooling line, along with RF co-axial line in the transmitter section, were to be isolated before taking the combiner out for repairs.

- i. In rack A of the transmitter RF co-axial line in between Harmonic filter and 4.7 dB combiner at 8 way input ports were removed after making standby arrangement of connecting 2 KW video output from single visual PA in

4 way combiner rack B. Output of this PA was directly connected to CIBD visual input port. Audio output from audio PA was reduced in proportion with single 2 KW of visual power.

- ii. The cooling line of 8 way input was blocked by closing valves of the cooling line to the input of the combiner. Flanges on the water cooling line connecting combiner with valve output were removed so as to isolate combiner from main cooling line.
- iii. The 8 way combiner along with output co-axial line section up to harmonic filter was dismantled from the rack after unscrewing it from horizontal and vertical mounting plates of the rack.
- iv. The combiner was opened and necessary repairs or replacement of defective resistances on heat sink mounts of the combiner and its burnt connecting stripes were carried out. Thereafter cleaning of all input ports of the combiner and its connecting stripes done the combiner was carefully assembled.
- v. In the second phase the 4 way combiner was also removed from rack B after following the same procedure of isolating the RF co-axial line and cooling line assembly and carrying out necessary repairs.
- vi. Both combiners were tested before putting them back in operation.



The power and phase of individual Power Amplifiers was adjusted optimally and the performance of the transmitter was observed to be O.K. There was no heating up of reject loads and PAs. **The total cost of repairs came out to be about Rs. 44000/-**. Measurements of isolation between the ports were taken and the test report of the 8 Way Combiner is tabulated as below:

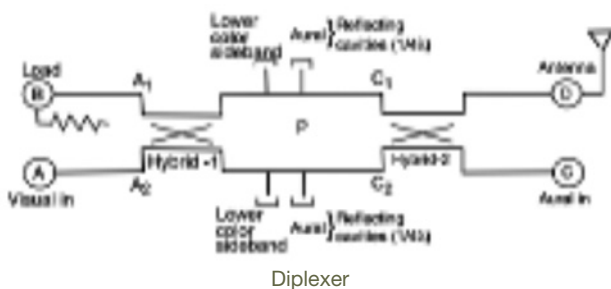
At input port	VSWR	Isolation at other ports	Other ports were terminated with output connected to 50Ω of 4.77dB combiner.
1	1.11	18dB	
2	1.12	17dB	
3	1.13	18dB	
4	1.12	18dB	
5	1.12	17dB	
6	1.11	18dB	
7	1.12	18dB	
8	1.13	18dB	

Diplexer

The filtered visual and aural outputs are fed to a diplexer where the two signals are combined to feed the antenna. Video and Audio carriers are kept so close to each other

that they are accommodated in the same channel width. Thus, both can be transmitted by a single antenna. There is one difficulty – the video modulation signal would enter the audio section and audio modulation signal would enter into the video section in the transmitter. This can be solved by use of the diplexer. Depending on the design and operating power, the colour notch filter, aural and visual harmonic filters, and diplexer can be combined into a single mechanical unit. A hybrid combiner serves as the building block of the notch diplexer, which combines the aural and visual RF signals to feed a single-line antenna system and provide a constant impedance load to each section of the transmitter. The notch diplexer consists of two hybrid combiners and two sets of reject cavities. The system is configured so that all of the energy from the visual transmitter passes to the antenna (port D), and all of the energy from the aural transmitter passes to the antenna. The phase relationships are arranged so that the input signals cancel at the resistive load (port B). Because of the paths taken by the aural and visual signals through the notch diplexer, the amplitude and phase characteristics of each input do not change from the input ports (port A for the visual and port C for the aural) and the antenna (port D), thus preserving signal purity. Visual RF appears at the input port of a 3dB coupler. Between the two couplers are filters for aural carrier, and possibly notches for -3.58MHz and +7.16MHz. Any energy at those frequencies is reflected back to the input coupler where it appears at the dump load. At the output coupler the visual energy recombines at the antenna port.

Aural RF appears at the output 3dB coupler, gets split and sent towards the input 3dB coupler. When it arrives at the aural notches it is reflected back to the output coupler where it recombines and appears at the antenna port.



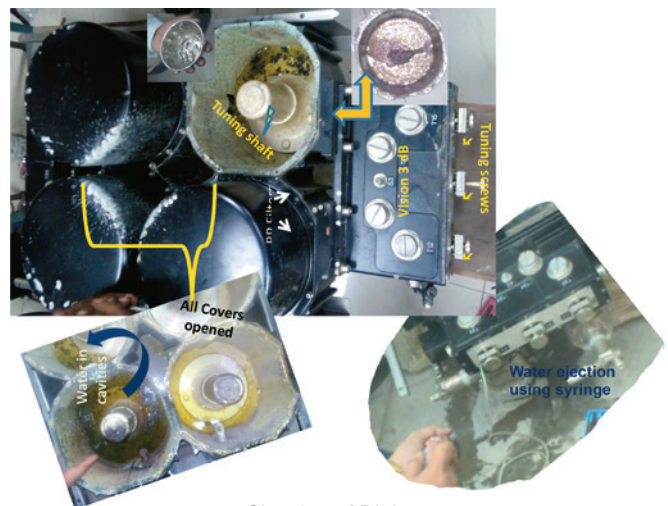
Doordarshan Kendra at Bareilly (Uttar Pradesh) was flooded during heavy rains, due to which both Doordarshan transmitters for DD National and DD News were shut down. The severity of flood may be seen in the photograph. The water level at the station at Bareilly reached to a level of 2 feet in the transmitter hall. Due to this level of water, all the transformer, coils and capacitors of the DD1 transmitter got submerged. Most of the equipment that could be easily removed were removed and placed in a safe place. CIN Diplexer Two-Way Combiner of DD News was submerged in water and water seeped into the equipment.

The diplexer was removed from the transmitter and its measurements were taken. Since, it was suspected that water may have crept into the equipment; 4-reducers were required for taking its measurements. The VSWR of both video input and audio input signal was very high in the



range of 16 to 17. The diplexer was carefully opened from the transmitters. The filter of diplexer was wet and clogged with mud. It was cleaned with utmost care.

To remove the water from both of the 3 dB divider, a siphon (created by using an injection and a tube) was employed. The photograph of diplexer provides the saga of defect and repairs. Some tuning of diplexer was carried out to get its best performance, and measurements were taken again.



Final figure of the measurements of the diplexer is given below:

	VSWR	Insertion loss
VISON Transmitter		
VISON transmitter frequency (fv +4MHz/-1 MHz)	<1.08	≤0.2 dB
VISON transmitter frequency (fv +4.5 MHz)	<1.08	≤0.4 dB
VISON transmitter frequency (fv +5 MHz)	<1.1	≤1.6 dB
AUDIO Transmitter		
Sound transmitter frequency (476.75 MHz)	<1.12	≤1.08 dB

After taking measurements, which are within the specifications, CIN Diplexer was placed into the circuit and the exciters were re-configured. After which power was increased slowly. It was found that the transmitter was working fine. The new cost of such a diplexer would be about Rs. 48 Lacs.

Conclusion

The skills required for uninterrupted transmission and optimum performance of the RF equipment are very critical particularly during the convoluted defects. Trained and experienced engineers are requisite resources for the organisation. In the above cases the repair work was highly innovative, cost effective and quickly implemented. The critical parameters of the equipment needs to be recorded and displayed during optimum performance and periodic maintenance should be carried out routinely. The VSWR, output level at each stage, temperature, vibrations, currents etc. should be observed by the operating staff and deviations require timely action to prevent further damage. The capacity building of operating staff from time to time is essential

and advantageous for optimum performance of broadcast equipment. The repair procedures of ADG(NZ) AIR and TV, New Delhi, are an example for any budding Engineer to emulate. The reconditioning of convoluted defects in costly equipment's e.g RF Combiner (Costing @ Rs.62 Lacs) and Diplexer (Costing @ Rs.48 Lacs) at the very low cost of about Rs. 44,000/- is an educative exercise.

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2. Manual of 20 kW UHF NEC Transmitter.
3. Inputs from O/o ADG (NZ) AIR & DD New Delhi.
4. Television Engineering Handbook, McGraw-Hill, New York, Benson, K. B., Ed.
5. The RF Transmission Systems Handbook, Jerry C. Whitaker

authors

M. S Duhan, DDG(E)
DDG (E), DDM (NZ), Doordarshan India, New Delhi.

Sh. M. S. Duhan brings vision for the system design and maintenance of all broadcasting organs encompassing Studios, Earth Stations and Transmitters of AIR and Doordarshan. He has over three decades of experience in broadcasting sector with a predominant focus on digital terrestrial technologies, their eco-system and solutions. He possesses degree in Electrical Engineering, MBA and Master of Mass Communication. Sh. Duhan is a participant at various industry forums, events, Journals and TV Talk shows. He is a recipient of numerous honors and awards including "Best Maintained Transmitters Awards" by DG:DD, "The Best Article" award conferred by ABU, and Dr. Vassumai Hazarimal Merani Award for technical innovative work in the field of digital technology related to broadcasting conferred by BES(I).

Sh. Duhan has immense passion towards promoting Terrestrial TV in India and to propel DTT into its next growth phase. He has published many papers/articles on issues related to Terrestrial TV and Radio Transmission and Usage of RF Spectrum, in the National and International Journals and participated in TV Talk shows. He has contributed significantly in the implementation of DVB T2 Transmitters in India and finalization of BIS Standard for DVB T2- HDTV STB and IDTV. He is currently posted at Maintenance Wing of Zonal office of Doordarshan at New Delhi and is responsible for maintenance of Doordarshan TV Network in North Zone. He is anchoring a new initiative in repair and measurement methodology for TV Transmitters.

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Sh. Satya Pal
DDE, Doordarshan India

Sh. Satya Pal has deep insight and understanding of broadcasting technology and equipment. He has wide ranging experience in the field of broadcasting encompassing programme production, post production and transmission for over 3 decades in AIR and Doordarshan. He is a Trainer of repute in broadcast technology. He has carried out various indigenous substitutions and repairs of Power Amplifiers, Power Supplies, IRDs, Combiners, Diplexers, HPAs, Encoders etc. He has been awarded with Doordarshan Awards for the years 2007 and 2008 under the category "Best Technical Paper". Presently he is working as ADE at O/o ADG(E) North Zone New Delhi.

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5TH REGIONAL WORKSHOP ON

OTT and IBB Technologies and Services for Media: Production to Delivery

26th – 28th September 2017, Kuala Lumpur

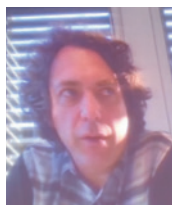
by **Dr AMAL Punchihewa**

Director Technology and Innovation, ABU

The ABU, in collaboration with the Asia-Pacific Institute for Broadcasting Development (AIBD), conducted the 5th Regional Workshop on Over-The-Top (OTT) and Integrated Broadcast Broadband (IBB) Technologies and Services, having the theme, 'Production to Delivery'.



The three-day workshop introduced IP technologies and addressed some of the main issues that broadcasters are facing when they want to introduce OTT and IBB production and delivery services within their portfolios. Though this year's workshop focused mainly on technological aspects, it not only explored the technology but also looked at other value added services and business opportunities that broadcasters can take to attain a competitive edge in the market place. A regulatory session with the legal department of ABU addressed regulatory issues in OTT services. Case studies from the Asia-Pacific region and beyond were presented, together with some references to European implementations. A number of ABU members shared their experiences in relation to IBB, OTT and the use of an evolving distribution of technologies.



Mr Bram
Tullemans

Mr Bram Tullemans, Project Manager (Broadband Technology and Online Services) of EBU Technology and Innovation, made a contribution from Geneva on Multi-CDN pilot project EBU-flow via cloud.



The ABU continues to lead the way in helping its members to make use of emerging delivery technologies. Over 60 participants (51 ABU members from 39 organisations) from 18 countries shared their experiences during 19 sessions; among the topics were QoS and QoE, HbbTV, Hybridcast, IP based media production, receive devices, catch up VOD services, immersive audio and video, online media distribution and the Malaysian myFreeview platform. Over the three days, discussions covered a variety of technologies, infrastructures and services connected with IBB and OTT. Panel discussions including, "Are we responding correctly to market signals" and questions helped participants to clarify their various issues. Throughout the three-day event nineteen speakers, representing ABU members both from broadcasting and solution providers, industry and regulators, shared their knowledge and experiences.

At the beginning of the workshop, Mr Masaru Takechi of NHK provided an update on Hybridcast, its current & possible services and other related developments, including Internet of Things (IoT). He explained both HbbTV and Hybridcast engines are based on a HTML 5 browser technology. The application control signal, that transmits with broadcast, enables seamless navigation between broadcast and broadband. Wide range of applications are possible, viz. managed (broadcast and



Mr Masaru
Takechi



non-broadcast) and general application. Personalised advertisement insertion is possible and time-text markup language (TTML) is used for closed captioning. Hybridcast for UHD-2 employs Universal Coded Character Set.



Ms. Teresa Cheung

Ms. Teresa Cheung, Managing Director HK, Eurofins Digital Testing, Hong Kong presented HbbTV 2 New Feature Deployment, User Cases, Delivery Modes and Testing Resources. She explained that HbbTV can operate in three modes, viz. Broadcast-only, Broadband only and Hybrid. Hybrid broadcast-broadband is the most common mode and has the

potential to leverage on broadcasting and non-linear access on broadband. These can be accessed on devices such as connected TVs, set-top-boxes and multi-screen devices.

Mr. Keisuke Miki, Vice President-Engineering, Dept. of JNN Technology Strategy, Division of TV Technology, TBS Television, Inc. (TBS-Japan) presented Catch-up VOD service developed by five major Japanese commercial broadcasters. This catch-up VOD service, with a portal site and capability for advertisement insertion, is known as Tver. The project was started in 2015. The VOD service has free catch up for a certain period, transactional and subscription VOD. The reason to collaborate was to accommodate the time-shift viewing with an increasing trend. Mr Miki said, "The aim of Tver is adaptations to device-shift, time-shift and change of advertisers' demands." These were all based on changes of viewing behavior. The smart device is always at hand and the smart phone is the first device for viewing content.



Mr. Keisuke Miki



Mr. J K Lim

Mr. J K Lim, Aspera (IBM) presented Acceleration of File Transfer

In his presentation, he explained that various products using are using a wide range of algorithms to facilitate the accelerated file transfer. He also described how such accelerated file transfers helped in carrying out broadcasting events.

Mr. Jerry Gui, Regional Senior Staff Engineer, Dolby Singapore, presented Immersive Audio Experience in OTT and HbbTV Services. Mr Gui explained the use of hydynamic range (HDR) which could create an enhanced viewing experience. Such immersive viewing experience delivered a 'wow factor' which could be a driver for the introduction of HDR for selected content.



Mr. Jerry Gui



Mr. Samantha Harsha Jayadheera

Mr. Samantha Harsha Jayadheera, ICT Administrator of Sri Lanka Rupavahini Corporation (SLLR) presented how cross media can be used to promote main stream media. He presented a case study from SLRC to explain how the station promotes its programmes and connects with the audience to inform, create loyalty and to maintain an on-going relationship. Facebook

and other social media can be used to reach some of the audience while they are mobile.

Mr. CB Lau, VP Sales and Marketing at Caton Technology, Caton presented Leveraging IP Technologies and Powering Open Internet Broadcasting. In his presentation he used case studies and practical cases where such technology was used to get contributions from remote locations with modest resources using the public internet.



Mr. CB Lau



Mr. Klaven Siow

Mr. Klaven Siow, Applications Manager, Tektronix/TekInside Media, presented 'QoS and QoE, Awareness for IP, Linear and OTT services.' He explained the value of video and network quality for OTT services. Though there no are well established quality metrics, PSNR has been used over years. He introduced a quality metric that has been developed by Tektronix which they claim correlates to human perception and is hence a proxy for Mean Opinon Score-MOS.

Mr. Erling Hedkvist, Senior Vice President and Business Development Manager, LAWO presented IP based Media Production. He explained how the broadcast industry is working in collaboration to leverage on IP in every part of the value chain. LAWO's commitment to Research and development has led them to the forefront of IP readiness and products. He reminded that LAWO took part in an IP interoperability lab that was operated during BroadcastAsia 2017.



Mr. Erling Hedkvist



Ms. Seemantani Sharma

Ms. Seemantani Sharma, Legal & IP Services Officer, ABU, in collaboration with Dr AMAL Punchihewa presented the topic Regulatory Aspects in relation to OTT. He explained issues in broadcast regulatory framework. Having defined net neutrality, she highlighted the importance of correct definitions for terminology used in broadcast industry.

Mr. Mika Kanerva, COO and Co-Founder, Sofia Digital, presented HbbTV features on the MyFreeView platform. He explained how authoring and development of application programme interfaces (APIs) are done for integrated broadcast broadband services. He shared some outcomes from recent trials carried out to explore the possibility of inserting audience- specific advertisements.



Mr. Mika Kanerva



Ms. Anne-Laure Cedexis

Ms. Anne-Laure, Cedexis, Singapore, presented Multi-CDN for future media operations. She explained how such an architecture and system could enhance media delivery over networks. While improving the throughput of the delivery, the network could also provide resilience against outages of parts of a greater network.



Dr. Leon Mun
Wai Yuen

Dr. Leon Mun Wai Yuen, Sony EMCS (Malaysia), presented 'IBB & OTT: A Receiver Manufacturer's Perspective – Preparing your DTT Receiving Equipment Specifications (STBs, TV sets and antennas)'. He explained how SONY as a device manufacturer tries to improve the user interface (UI) which is an important aspect of better user experience (UX).

Mr. Oliver Linow, Distribution Systems, Applications and System Operation, Deutsche Welle (DW), presented 'Online Media Distribution.' He explained how DW deliver

their content globally making use of the Internet supported by CDN and other monitoring tools. Mr Linow has been a regular speaker at these events and every year he shares how DW uses the evolving technologies to provide efficient and cost effective solutions.



Mr. Oliver
Linow

This was the fifth workshop in the series on IBB and OTT Technologies and Services, conducted successfully since 2013. To learn more about these developments and latest updates in 2018, please join the workshop at the Capitol Hotel, Kuala Lumpur, from 25th to 27th September 2018.



14th Global Shortwave Coordination Conference

22nd - 26th January 2018, Kuala Lumpur

The 14th Global Shortwave Coordination Conference will be held in Kuala Lumpur from 22nd to 26th January 2018. Participants of the three coordination groups, representing around 90% of the shortwave in the world, will take part in this conference to coordinate shortwave frequency schedules for the A-18.

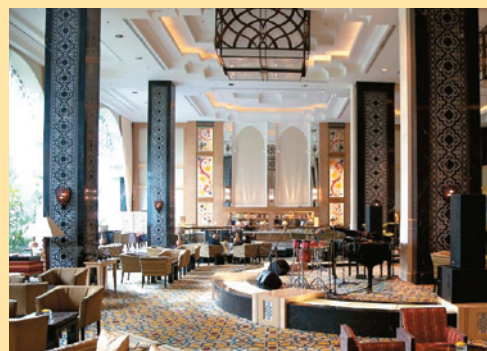
The coordination conference is hosted by the ABU and we are delighted to invite you and your organisation to participate in this conference.

CONFERENCE VENUE

The conference will take place at:

HOTEL ISTANA

73, Jalan Raja Chulan,
50200 Kuala Lumpur,
MALAYSIA
Tel: +603 2141 9988
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INTRODUCTION

The High Frequency Coordination Conference (HFCC), the Arab States Broadcasting Union (ASBU) and the Asia-Pacific Broadcasting Union (ABU-HFC) will hold the 14th Global Shortwave Co-ordination Conference at Hotel Istana, Kuala Lumpur from 22nd to 26th January 2018. The conference is hosted by the ABU.

Shortwave broadcasting has a unique position in that the radio channels used by international stations are not assigned, but regularly coordinated for two seasons each year. The frequency channel situation for shortwave radio is always changing because of the 11 year solar cycle and seasonal effects, as well as because of new or changed frequencies of shortwave broadcasters around the globe. Co-ordination methods were started by broadcasters with support from the broadcasting unions. The International Telecommunication Union (ITU) set up a special task group that studied the emerging co-ordination procedures in the 1990s and concluded that the system should become an integral part of shortwave spectrum

management. The principles were incorporated in Article 12 of the International Radio Regulations in 1997.

At present a single global seasonal database of frequency requirements is kept by the secretariat of the High Frequency Co-ordination Conference for each of the two seasons of the year. There is an on-line upload process available and all participants are requested to update any frequency changes between seasonal conferences. The automatic processing software notifies all participants, not only on the entered changes, but also on the possible collisions or incompatibilities that may have resulted from the submissions.

The Coordination Conference provides you and your organisation with a valuable opportunity to coordinate your frequencies directly with the frequency managers of other broadcasters and prevent interference occurring in your radio services. If you or your organisation is not present at this conference, elimination of interference in your shortwave services and preservation of your shortwave frequencies cannot be ensured. Therefore, we strongly suggest that you consider participating in this conference on behalf of your organisation.



4th REGIONAL WORKSHOP ON ENGINEERING FUNDAMENTALS FOR BROADCASTERS

4th - 8th December 2017, Kuala Lumpur, Malaysia

We are pleased to announce the ABU-AIBD "4th Regional Workshop on Engineering Fundamentals for Broadcasters", from the 4th – 8th December 2017 in Kuala Lumpur.

Media and broadcast technology and infrastructure have been evolving rapidly in recent years. This has brought many challenges to broadcast and media institutions. Not only the 'nut and bolts', but also human resource requirements have changed and are changing continuously. This training aims to address both of these issues for new personnel who have developed a passion for this field.

Aims

The workshop aims to provide basic engineering fundamentals for broadcast engineers and technologists who are at the beginning of their careers. The workshop facilitates participants to learn about the current trends and advancements in broadcast technologies. It will also focus on fundamentals of IT, audio and video systems, engineering techniques and applications. The knowledge gained will help participants to build confidence in operating in an evolving media value chain.

Objectives

By the end of the workshop the participants will be able to explain and apply in their work:

- Basics of Audio and Video
- Concepts of analogue to digital signal conversion
- Signal processing in the media value chain
- Multiplatform delivery and Quality of Experience
- Converged media-IT-broadcast environment
- Radio and TV transmission concepts, techniques and technologies
- Evolving media and delivery platforms

We are delighted to invite colleagues from media field. The following provide the profile of participants.

Profile of Participants

- Technical staff in broadcast stations
- Broadcast Engineers/Technologists, technicians and IT support staff in broadcasting, especially young team players who have had some exposure to IT, audio and video systems.
- At least five years of experience in IT, radio and/or television field as an essential condition
- Ability to understand, speak and write in English fluently.

WORKSHOP VENUE

The workshop will take place at AIBD in a Training room of AIBD in Angkasapuri.

ACCOMODATION

We have made arrangements for participants to stay at Hotel CaPITOL Kuala Lumpur for the special rate of MYR220 nett (approx. USD60.00) per night. As the number of rooms is limited early registration is advised.

There are no registration/participation fees for ABU members. Non-members need to pay a registration fee of USD200.00 to cover the participation costs for the five days. All expenses on the travel and stay of your nominee are to be borne by your organisation.

REGISTRATION

Please register online using the ABU website latest by 30th November 2016. As the number of participants is strictly limited, early registration with suitable registrations will ensure that your nominees are accepted.

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Opening Doors at IBC 2017

Simon Fell

Director of Technology & Innovation, EBU

The annual IBC exhibition and conference in Amsterdam is always an energizing experience, even if it leaves everyone feeling quite drained! I relish having the chance to meet and catch up with so many people from different parts of the media technology community – EBU Members, other broadcasters, industry contacts, partner organizations and journalists – as well as contributing to the conference.

Our stand in Hall 10 serves as a place where visitors can escape the commercial clamour of the exhibition. Our focus is always on providing non-biased information and demonstrations of technology developments that are significant for public service media. We had a particular emphasis this year on Member-driven projects, under the theme of “technology developed for broadcasters, by broadcasters”. I’d like to mention just a few highlights here.

Swedish Radio’s NXG project, recipient of the EBU Technology & Innovation Award earlier this year, was certainly one of the busiest parts on our stand. Their remote broadcast solution allows journalists to contribute live coverage and to self-operate entire radio shows away from the studio. While the demo was naturally of great interest to the radio community, its impact went far beyond that. With all of the technology controlled over IP networks, the project has generated valuable know-how around network configuration, synchronization, Quality of Service and so on.

Another constantly busy part of our stand was the EBU Flow demo. Flow is a pilot project from EBU Technology & Innovation that allows for OTT delivery via multiple CDNs (content delivery networks). The service automatically selects the fastest CDN to use at any moment, thus improving the QoS for the end user. For the broadcasters participating in the pilot, combining their buying power means better rates from the CDN providers. (More information: tech.ebu.ch/flow)

UHD EVOLVES

UHD has been a guaranteed crowd-puller at IBC for a number of years now. The story evolves each year as the technology matures and, importantly, the standards ecosystem takes shape. At IBC this year we hosted three demonstrations that helped to put more pieces of the puzzle into place. One real eyecatcher was the footage shot by Swiss broadcaster RTS at this year’s Montreux Jazz Festival. In collaboration with the EBU, a real-world UHD production was mounted



combining the latest standards for High Dynamic Range (HDR) and Wide Colour Gamut. I couldn’t help but notice how visitors passing by our stand would stop and stare at the glorious images.

HDR was also a key element of the demo contributed by our colleagues from BBC Research & Development. Their focus was on the format conversions that will be essential for broadcasters in the transition to UHD. There was plenty of interest from visitors in their tools for converting between SDR (Standard Dynamic Range) and the different variants of HDR. We also hosted the Ultra HD Forum, of which the EBU is a member. They were showing an end-to-end chain to deliver UHD to mid- and high-end televisions, along with some early experiments with Higher Frame Rates.

A SPECIAL VISITOR

We had one extra-special visitor to our IBC stand this year. The EBU’s new Director General Noel Curran took up the role in September and he stopped by the stand just as we were putting the finishing touches to the various demos. A former DG of the Irish broadcaster RTÉ, Mr Curran’s own background is in journalism and programme production. In his address to the EBU General Assembly last June, he said that the main challenges for public service media are today driven by technology, “but technology opens more doors than it closes”. We were happy to show him what might lie behind some of those doors when we welcomed him to our stand at IBC. Now it’s time to start planning what doors we’ll be opening at next year’s show!

Mission Report on

TECHNICAL ADVISORY SERVICE TO THE VOICE OF VIET NAM

Training on Broadcasting Technologies in Hanoi and Ho Chi Minh City, Viet Nam
25th – 30th September 2017



Mr A. Raza, Director,
Whiteways Systems Pte Ltd

VOV – as the Voice of Viet Nam is popularly known is the stuff of legend and folklore in modern Viet Nam. In the current process of national renovation and integration, the Voice of Viet Nam has developed 4 media platforms: radio, print, TV and online. VOV now has 6 radio channels including News and Current Affairs channel – VOV1, the Education, Science, and Cultural life Channel – VOV2, the Music and Infotainment Channel – VOV3, the Ethnic Language Channel – VOV4, the World Service – VOV5 and the VOV National Traffic Channel. The Voice of Viet Nam also has 17 TV channels. With more than 3,400 reporters, technicians, broadcasters, and artists, 6 domestic bureaus and 10 overseas bureaus, the Voice of Viet Nam continues to grow as a multimedia agency providing news updates to listeners in Viet Nam and around the world. VOV, on the path to modernisation – approached ABU to organise a training course for their senior technical staff. A 6-day training was planned with topics such as:

- The changing nature of Radio and TV Broadcast consumption
- The new emerging landscape with OTT, Social Media and online Broadcasting
- Analogue to digital conversion
- Newsroom System
- Broadcast business management systems
- Modern video content production technologies
- Archival and restoration

Most of the training was conducted using videos with a few power point presentations thrown in. The emphasis

on discussion are sharing of views, and putting the global situation in context of what is happening in Viet Nam.

Participants were shown videos on how the broadcast industry was born, how it evolved over time and how we came to this point. Since most of the participants were engineers, they were familiar with video basics.

VOV was updated regarding the key threats facing the entire broadcast industry:

- 1) Digital advertising was eating into the television advertising revenue. This resulted in TV advertising revenue being dwarfed by digital advertising giants like Google, Facebook, Apple and Amazon.
- 2) Viewers were slowly going away from Linear TV and going towards OTT and VOD.
- 3) The quality of the programmes had to be updated as viewers are exposed to lots of international programmes and have come to expect a certain minimum level of quality. If VOV programmes did not meet this minimum level of quality, the viewers would switch off and watch something else.
- 4) TV Programmes are littered with graphics. On an average day, a TV stations plays out about 400 – 600 new graphics. This enables the station to carve out a special niche for themselves. Each programme can have a different look and feel.
- 5) News needs to be – “first on air”. Otherwise viewers get turned off and viewership plunges and revenue also plunges.
- 6) Content is King. The main output of the TV station is content. Content production, post-production, colour grading, finishing becomes very important.





How will VOV overcome these threats:

- VOV will need to upgrade their production capability. They have to produce content that is tailored to each section of the population demographic.
- VOV will need to start using modern technology like Special FX, colour grading, audio FX and editing tools to make outstanding dramas, documentaries, films, children's programmes etc.
- VOV will need to use all the modern technologies, like ENG, OB Vans, DSNG, a newsroom system, file-based editing systems to produce latest, breaking news.
- VOV will need to have a central, full frame, 3D graphics capability with virtual sets, video walls, to produce and display hundreds of new graphics daily so that the look and feel of the channels looks modern and appealing.
- VOV needs to have a central business management system so that one central sales team can attract customers by cross selling, up selling across all the 4 areas of print, online, radio and TV. This business management system will also produce financial reports which will help management take critical decisions.
- Lastly, VOV has to have a modern, file-based archival system which will store all the assets (audio, video, text, graphics, photos, documents) in a central repository. This repository should have the search and retrieve function.
- VOV has to upgrade their audio and video quality so that viewer find the content attractive, colourful and will continue to watch it on UHD and 4K Television sets
- VOV has to transmit their content via as many transmission platforms as possible – including digital terrestrial, OTT, VOV Website, social media and by cable TV.

The workshop held in VOV Headquarters, Hanoi was attended by 43 participants and the workshop in the VOV Training College in Ho Chi Minh City was attended by 49



participants. The expert for the mission, was Mr Aale Raza from Whiteways Systems Pte Ltd.

There was a broad consensus that this training was very useful and more such training events needed to be organised. VOV management and staff were unanimous that ABU had given great help to VOV and they expressed their thanks ABU for organising the training.



News

from the ABU Region

Channel NewsAsia Renews on AsiaSat 3S

Asia's leading satellite operator, Asia Satellite Telecommunications Company Limited (AsiaSat) announced that regional broadcaster, Channel NewsAsia is continuing its distribution carriage on AsiaSat 3S. MCN International Pte. Ltd. which operates Channel NewsAsia, has renewed its contract to beam its signals in the Asia-Pacific region.

Channel NewsAsia offers news programming and content with unique Asian perspectives. The channel is widely available to all Asian cable and satellite DTH networks, terrestrial television stations, hotel networks and private viewers under AsiaSat 3S's region-wide C-band footprint, which reaches more than 50 countries. From January 2013, Channel NewsAsia will start broadcasting "live" news 24 hours a day, as part of its plans to serve a wider international audience.

"We have enjoyed our long standing relationship with AsiaSat. We've been on the satellite since 2003 and it has served our viewers in the region well. As we look to extend to more markets in the next phase of the channel's growth, we are happy to continue this partnership with AsiaSat," said Woon Chuk Chan, Vice President, Channel Distribution, Channel NewsAsia.

William Wade, President and Chief Executive Officer of AsiaSat said, "We are very pleased to extend our long-term partnership with Channel NewsAsia. We appreciate the vote of confidence for our service. We look forward to continuing to support the expansion initiatives of Channel NewsAsia, bringing 'live' news around the clock to Asian viewers through the exceptional access and power of AsiaSat 3S."
(C+T)

International Recognition for Radio NZ's Multimedia Journalism

Radio New Zealand has been shortlisted alongside some of the world's leading broadcasters and news organisations in the prestigious Association for International Broadcasting (AIB) awards announced in the UK. An international panel of judges has recognised RNZ's multimedia excellence in audio, video, and presentation categories. RNZ is up against strong competition from the BBC World Service, Deutsche Welle, Al Jazeera, The Financial Times, Bloomberg TV, and SBS in three major categories.

RNZ News is shortlisted for its outstanding coverage of the Kaikoura earthquake in the continuing news category, Checkpoint presenter, John Campbell, is one of three finalists for Presenter of the Year, and in a first for RNZ, the popular podcast series The 9th Floor gets recognition in the video section competing against long established providers of high quality video content.

The annual AIB awards are presented for the very best in factual video, audio and interactive programming and production. The AIB represents major broadcasters from 30 countries serving audiences of hundreds of millions around the world each week. Winners of the 2017 AIB Awards will be announced in London on Wednesday 1st of November.
(radionz.co.nz)

ABC the Exclusive Broadcaster for Invictus Games, Sydney 2018

In a celebration of courage, determination and the unbeatable human spirit, the ABC has announced it will become the exclusive broadcaster of the fourth Invictus Games to be held in Sydney in October 2018.

The international multisport event, launched three years ago by Prince Harry and the Invictus Games Foundation, will see over 500 competitors head to Australia to take part in eight days of competition in the international adaptive sports event open to wounded, injured and ill veterans and serving defence personnel.

Featuring special appearances from sporting icons Ian Thorpe, Nicole Livingstone and Paralympic gold medallist and Invictus Games competitor, Curtis McGrath, Unconquered: The Invictus Games introduces us to the competitors as they gear up to the event, revealing what motivates them and highlighting how their determination has helped them triumph over the physical and emotional challenges they've faced. In addition to this, from the 24th of September the ABC and iview will broadcast a Daily Highlights Show fast-tracked from Toronto at 3.40pm. Audiences can also enjoy a collection of various short form content from the games on iview, including videos of competitor's profiles and guides to the various sporting events.
(C+T)

SBS Announces Changes Radio Services

Australia's SBS Radio has announced changes to its services to reflect what it says is Australia's rapidly changing and increasingly diverse society.

Based on the findings of 2016 Census, more than 1.3 million people have migrated to Australia in the past five years and nearly 4.87 million people speak a language other than English at home including Indigenous languages. The revised services will include seven new languages, including six 'high needs' languages and one 'large' language supporting new communities who need news and information in their language as they navigate life in Australia. The new languages are: Telugu, Karen, Tibetan, Hakha Chin, Rohingya, Mongolian and Kirundi (Rundi). All content in the new languages will be available digitally via on demand audio podcasts accessible via the SBS website and SBS Radio app to meet the needs of those audiences.

During a four-week consultation process (14 November – 11 December 2016) which gave people and organisations the opportunity to provide feedback on the Selection Criteria that was being proposed, SBS Radio received more than 600 submissions; representing 85 languages. The submissions received were taken into consideration in finalising the Selection Criteria, which in conjunction with the 2016 Census data, has determined the revised language services to be provided by SBS Radio. The last review of SBS Radio was conducted during 2012-2013, after the 2011 Census.

Based on the final Selection Criteria for the SBS Radio Services Review and as Australia's multicultural communities evolve, 12 current languages will be discontinued as they do not meet the Selection Criteria. These languages are Kannada, Tongan, Norwegian, Cook Island Maori, Fijian, Swedish and the African program (in English) and the following languages that have been in recess for the last 12 to 18 months including Lithuanian, Malay, Latvian, Danish and Maori. These are among the 21 languages broadcast on the 24 hour digital radio station SBS Radio 3, which is also broadcast on digital TV as an audio channel.

The remaining nine languages currently on SBS Radio 3 will be retained and include Estonian, Finnish, Ukrainian, Slovenian, Czech, Bulgarian, Slovak, Romanian and Armenian. They will be made available on analogue radio services. SBS Chill, the 24 hour music radio station, will be simulcast on SBS Radio 3 temporarily after the changes are implemented.

Following the changes, SBS Radio will offer services in 68 languages and the new SBS Radio services will be implemented on air effective Monday 20 November 2017. *(radioinfo.com.au)*

AsiaSat and Arqiva Extend Lease for Content Delivery in Asia-Pacific

Arqiva, the UK's leading communications infrastructure and media services company has extended its lease for C and Ku-band capacity with Asia Satellite Telecommunications Company Limited (AsiaSat), Asia's leading satellite operator for sports content delivery across the Asia-Pacific.

The agreement will see Arqiva's continued use of AsiaSat 5 to deliver a broad range of sporting events to Asian viewers, from football and cricket, to volleyball and tennis. The new agreement also provides Arqiva the option of using Ku-band capacity on AsiaSat 7, allowing additional flexibility in the deployment of smaller antennas for occasional use and live events.

Arqiva's expanded collaboration with AsiaSat demonstrates AsiaSat's capability in presenting a wide range of satellite capacity of the quality and penetration that meets clients' distribution needs. AsiaSat's ubiquitous coverage now plays an essential role in Arqiva's global content delivery network. *(RapidTVNews)*

Six Transmitters Added to World's Largest DRM Project

Nautel Limited has shipped six additional high-power DRM-enabled MW transmitters for deployment at All India Radio, the largest digital broadcasting system in the world. Four 100kW NX100 and two 200kW NX200 transmitters were shipped to India in July 2017 for installation in six cities. The transmitters will be commissioned by Nautel's in-country partner Comcon in association with India's Prasar Bharati.

The project has the goal of bringing digital radio to nearly a billion residents of the country. The new transmitters will be installed at All India Radio (AIR) facilities in Hyderabad, Jagdalpur, Vishakhapatnam, Bhawanipatna, Jeypore and Sambalpur. All 33 transmitters in the AIR project are configured for DRM30 operation.

Nautel NX high power transmitters occupy a very small footprint and offer the industry's highest efficiency (90 percent) along with AM pre-correction, unmatched linearity and Nautel's exclusive, award-winning Advanced User Interface which provides commercial grade instrumentation, spectrum analyser, logging, presets, local and remote transmitter control, email notifications and enhanced support services.

(radioinfo.com.au)

TV New Zealand Renews Content Deal with ITV Studios

TVNZ in New Zealand has renewed its output agreement with ITV Studios Global Entertainment (ITVS GE) for all its content in the country.

One of New Zealand's leading commercial broadcasters, TVNZ reaches more than 2 million people through TVNZ 1, 2, DUKE, its online entertainment destination TVNZ.co.nz and its news site 1NEWS NOW.

Renewing in 2018, the new multi-year deal means TVNZ will continue to have first look across all of the UK broadcaster's genres including drama, entertainment, factual entertainment and documentaries. As well as airing new series including Victoria, Cold Feet and Prime Suspect: Tennison, TVNZ will continue to show some of ITVS GE's most popular series from Coronation Street and Emmerdale to The Chase and The Jeremy Kyle Show.

(RapidTVNews)

Successful Lift-off of AsiaSat 9

Asia Satellite Telecommunications Company Limited (AsiaSat), Asia's leading satellite operator announced successful lift-off of AsiaSat 9, the company's most powerful and advanced communications satellite on 29 September at Baikonur time 00:52 a.m. (02:52 a.m. Hong Kong Time). It is the 5th AsiaSat satellite built by SSL and the 5th launch collaboration with ILS's Proton Breeze M rocket.

AsiaSat acquired the first signals from the satellite in Hong Kong 7 hours, 54 minutes after the launch, and approximately 9 hours, 13 minutes after lift-off, the AsiaSat 9 spacecraft successfully separated from the upper stage of the launch vehicle. AsiaSat 9 is now moving to its operational position in a Geostationary Orbit, where in-orbit testing will be carried out over the few weeks before it begins commercial service.

AsiaSat 9 will also offer brand new coverage for high growth markets in Asia, including the world's first dedicated Ku-band Myanmar beam, high-power Ku-band beams for Indonesia and Mongolia, in addition to two enhanced Ku-band beams serving Australasia and East Asia, and a wide C-band footprint that offers significantly improved power over Asia, Australasia and the Pacific region.

(advanced-television.com)

Digital Broadcasting Update

SMPTE® Approves ST 2110 Standards for Professional Media Over Managed IP Networks

First Documents of the Standards Suite Support Professional Media Over IP Networks in Real-Time to Enable More Flexible, Efficient, and Creative Workflows



SMPTE® has announced the approval of the first standards within SMPTE ST 2110, Professional Media Over Managed IP Networks, a new standards suite that specifies the carriage, synchronisation, and description of separate elementary essence streams over professional internet protocol (IP) networks in real-time for the purposes of live production, playout, and other professional media applications.

With SMPTE ST 2110 standards, intrafacility traffic now can be all-IP, which means that organisations can rely on one common data-centre infrastructure rather than two separate facilities for SDI and IP switching/routing. The foundation for the first SMPTE ST 2110 standards came from Video Services Forum (VSF) Technical Recommendation for Transport of Uncompressed Elementary Stream Media over IP (TR-03), which VSF agreed to make available to SMPTE as a contribution toward the new suite of standards. SMPTE ST 2110 standards make it possible to separately route and break away the essence streams – audio, video, and ancillary data. This advance simplifies, for example, the addition of captions, subtitles, and Teletext, as well as tasks such as the processing of multiple audio languages and types. Each essence flow may be routed separately and brought together again at the endpoint. Each of the component flows – audio, video, and ancillary data (there may be multiple streams of each type) – are synchronised, so the essence streams are co-timed to one another while remaining independent.

(SMPTE)

DVB SB Approves New Subtitling Specification

DVB TTML Subtitling Joins UHD Family of Specifications Providing Commonality for the Delivery of Traditional Subtitling for IP-based Platforms



At the recent meeting of the DVB Steering Board, the new specification for DVB TTML subtitling systems was approved. The specification enables the delivery of next generation subtitles in transport streams for broadcast television services, based on W3C Timed Text Markup Language (TTML). The new specification complements the bitmap based subtitle solutions, which have been in use for over 20 years.

TTML subtitles are increasingly being adopted, including by standards bodies ARIB, ATSC, EBU, SMPTE, ISO/MPEG in the Common Media Application Format specification and many others including platform specifications such as HbbTV. TTML subtitles were initially chosen by DVB for internet delivery of services using the DVB profile of MPEG DASH (TS103 285). TTML subtitles provide a data rate efficient solution for SD, HD and even UHD resolutions.

This new TTML delivery specification will allow service providers to transition over time to a common TTML subtitle format for both broadcast and internet delivered services. The specification has been published as BlueBook A174 and has been forwarded to ETSI for standardisation as an EN (European Norm). The elevated EN status is designed to ensure the TTML specification has a similar status to its bitmapped cousin (EN 300 743).

(DVB)

Global Digital Radio

A new eBook from Radio World International is now available



Digital radio continues to progress at a rapid pace worldwide. The latest Radio World International eBook, “Global Digital Radio,” takes a look at how each region is preparing for the transition, planned FM switch-off dates and requirements, ways in which digital radio can pave the way to the connected car, how digital radio’s emergency warning functionality can provide relief in times of disaster, and more.

Learn more in the latest free Radio World International eBook.
(Radio World)

Equipment Trends

Unified Multicam Live Production System

All in one solution allows single operator use in small to mid-sized six-camera live productions



EVS has announced a brand-new product within its family of live production solutions – X-One. This all-in-one toolset, delivers the signature speed and reliability of EVS technology for live productions requiring six cameras or less. The new system is built with EVS' software-defined technology foundation and puts all of the capabilities of a control room in the hands of a single production operator – all controlled from the solution's touchscreen.

The all in one solution encapsulates what's at the core of EVS' industry-standard technology – industry-leading speed and reliability. It allows for the ingest of six camera feeds – as well as for the media import of any other files – which operators use to create replays, control audio, cut together a live feed with the built-in video switcher and even add graphics to live programming which is output in broadcast-standard quality.

X-One is designed to be operated by one single user that can take advantage of its contextualized user interface that adapts to the type of production on which it's deployed. Different sports or entertainment productions will have dedicated interfaces, which highlight specific features and remove unnecessary ones. This puts users in a unique production environment with pre-defined functions and simplified operation. The dedicated UIs will be available on the EVS cloud and can be quickly downloaded and installed ahead of any production.

The system natively supports AIMS-compliant uncompressed IP ST 2110 feeds and further assists production operators with functions that can be deployed through a number of apps and plugins which can be built and continually added into the system. X-One's architecture can be easily configured to expand in input/outputs, as well as deliver UHD-4K formats for future needs.

The system will be available for purchase by the end of 2017 with further software upgrades available in Q1 2018 that will provide users with a wider range of applications and features.

(EVS)

Full-Frame Digital Motion Picture Camera System

Sony Electronics has unveiled VENICE – its first Full-Frame digital motion picture camera system. VENICE is the next generation of Sony's CineAlta camera systems, designed to expand the filmmaker's creative freedom through immersive, large-format, Full Frame capture of filmic imagery producing natural skin tones, elegant highlight handling and wide dynamic range. VENICE was designed through close collaboration with the creative community, fulfilling the requirements from filmmakers and production professionals.



VENICE combines a newly developed 36x24mm Full Frame sensor to meet the high-quality demands of feature filmmaking.

A new colour management system with an ultra wide colour gamut gives users more control and greater flexibility to work with images during grading and post-production. VENICE also has more than 15 stops of latitude to handle challenging lighting situations from low-light to harsh sunlight with a gentle roll-off handling of highlights.

VENICE has a fully modular and intuitive design with refined functionality to support simple and efficient on-location operation. It is the film industry's first camera with a built-in 8-stage glass ND filter system, making the shooting process efficient and streamlining camera setup. With VENICE, Sony is giving users the option to customise their camera by enabling the features needed, matched to their individual production requirements. Optional licenses will be available in permanent, monthly and weekly durations to expand the camera's capabilities with new features including 4K anamorphic and Full Frame, each sold separately.

The VENICE CineAlta digital motion picture camera system is scheduled to be available in February 2018.

(Sony)

Personalities & Posts

New ABU Technical Bureau Member – Turkish Radio Television Corporation



Mr Sahin Demir

Mr Sahin Demir

Deputy Head of Studios & Contribution-Broadcast Systems Department
Turkish Radio Television Corporation

Mr Sahin Demir was appointed the new ABU Technical Bureau Member for Turkish Radio Television Corporation in August 2017. He has been working as Deputy Head of Studios and Contribution in the Broadcast Systems Department since May 2017.

Sahin worked as technical manager for the TRT1 TV channel during 2009-2010, and he was founding manager of the TRTHD channel and co-founder of the TRT4K channel between 2010 and 2016.

He worked for TRT's Outside Live Broadcast Department as an engineer and chief engineer from 1991 to 2009. He was technical coordinator for TRT during the Athens, Beijing and London Olympic Games and all kinds of outside national and international live broadcasts.

Sahin graduated with a Bachelor of Science (BSc.) degree in Electronics and Telecommunication Engineering from İstanbul Technical University (İTÜ) in 1991, and a Master of Science (MSc.) degree in Electrical & Electronics Engineering from Hacettepe University, Ankara, in 1996.

New ABU Technical Liaison Officer and Technical Bureau Member for Mediacorp-Singapore



Mr Peh Beng Yeow

Mr Peh Beng Yeow

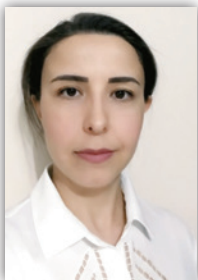
Vice President (Transmission) Mediacorp Pte Ltd

Mr Peh Beng Yeow has replaced Mr Kelvin Ma as the ABU Technical Liaison Officer and Technical Bureau Member for Mediacorp Pte Ltd, Singapore from August 2017.

Mr Peh has been heavily involved in digital broadcasting technology since 1999. Currently, he is the Vice President in the Transmission department and he is responsible for planning and executing projects related to TV and radio transmission system.

Mr Peh holds a Master of Business Administration (Strategy), a Master of Engineering Degree, a Master of Science Degree (Communication Network System) and a Bachelor Degree in Electrical and Electronics Engineering.

We welcome Mr Peh and wish to express our thanks and appreciation to Mr Kelvin Ma for his support for the ABU over the past few years.



Ms Gül Tuğba Yıldız

Ms Gül Tuğba Yıldız

New Technical Liaison Officer of Turkish Radio Television Corporation (TRT)

Ms Gül Tuğba Yıldız, Electrical and Electronics Engineer, has been appointed as the ABU Technical Liaison Officer for Turkish Radio Television Corporation (TRT) replacing Ms Kiymet Erdal.

Ms Yıldız has been working in the Transmission Directorate for more than eight years. The division specialises in the transmission of TRT broadcasts via satellite, fibre or cable all around the world.



Ms Kiymet Erdal

We welcome Ms Yıldız as the TLO for TRT and express our grateful thanks and appreciation to Ms Kiymet Erdal for her excellent support and input during her time as the ABU Technical Liaison Officer for TRT.



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