REGIONAL WORKSHOP ON DIGITAL RADIO

8 to 12 July 2019, Kuala Lumpur

Asia-Pacific Institute for Broadcasting Development
Angkasapuri, Jalan Pantai Dalam,
50614 Kuala Lumpur, Malaysia

8 July: Day 1 - Monday		Speaker
0900-0930	**Opening Session** Welcome Addresses Dr. Adnan Salhab, Head of Technical Department, Arab States Broadcasting Union Mr. Ahmed Nadeem, Director of Technology and Innovation, Asia-Pacific Broadcasting Union Director of the Asia-Pacific Institute of Broadcasting Development Dr. Lesley Sabel, WorldDAB Technical Committee Introduction to the Workshop and overview of the topics	Dr Adnan Salhab, ASBU Dr Les Sabel, WorldDAB Technical Committee
0930-1030	**Introduction to DAB+ Digital Radio** - Digital change in the radio industry - Broadcasting and IP - Current trends and pressures including emergencies - The next generation listener experience - History of DAB - WorldDAB latest developments and standards update - Global status update	Dr Les Sabel
1030-1100	Coffee Break	
1100-1230	**Why DAB+** - DAB+ business case - Review of alternative broadcast delivery methods - Review of IP only methods including 4 / 5G - Overview of hybrid operation	Dr Les Sabel
1230-1330	Lunch Break	

1330-1430	**Hybrid radio** • Hybrid broadcasting • Review of hybrid functionality • Hybrid Radio Use Cases • Hybrid delivery methods	Dr Les Sabel
1430- 1520	**Structure of DAB+ Broadcasting: Part 1: Head end system** • Services and Structure • Multiplexing and stream structure • PAD types and inclusion in ETI Stream • Data services • Signalling • Advanced features - Service Linking, Announcements and EWS	Dr Les Sabel
1520-1530	**Discussion and review of the day**	
9 July: Day 2 - Tuesday		
0900-1000	**Head end system design – Part 2: Location and support** • Location and structure overview • Support systems • IP system design • SId code assignment	Dr Les Sabel
1000–1030	**Head end system design – Part 3: Service integration** • Playout systems and PAD / Metadata servers • PAD generation methods • Workflow implications • Integration with hybrid services / servers **PAD server case studies**	Dr Les Sabel All-in-Media
1030-1100	Coffee Break	
1100-1130	**Head end system design – Part 4: Case studies** • Design examples from the real world	Anupon Tajawanno, Paneda
1130-1230	**Planning Part 1: Network design** • Network types • Multiplexer/Head-end location options • Traditional vs cloud architectures	Dr Les Sabel
1230-1330	Lunch Break	
1330-1415	**Structure of DAB+ broadcasting: Part 2: transmission** • Transmission overview • ETI/EDI • Modulation • Transmitters and Repeaters • Antenna Systems • Monitoring systems	Dr Les Sabel

1415-1520	**DAB+ transmitters** • Current Tx technologies and architectures • Air cooled v water cooled • Output structures and redundancy options • Control and monitoring	Alex Ng, Gates Air
1520-1530	**Discussion and review of the day**	Dr Les Sabel
10 July: Day 3 - Wednesday		
0900-0945	**What makes DAB+ environmentally friendly** • Power consumption and efficiency • Space and environment • Capital and Operating Costs • Comparisons with FM	Alex Ng Gates Air
0945-1000	**Receivers – Part 1** • Overview • Technology and trends	Dr Les Sabel
1000-1030	Coffee Break and receiver demonstration	
1030-1130	**Receivers – Part 2** • Receiver construction • Receiver modules • Product overview	Michael Chen Keystone Semiconductors
1130-1230	**Receivers – Part 3** • Home • Personal • Car / automobile • Voice control	Christian Trapl Pure Sohan Karunaratne Aqipa
1230-1330	Lunch Break and receiver demonstrations	
1330– 1430	**Planning Part 2: RF coverage and interference - Theory** • Spectrum and regulation overview • Coverage planning theory • Propagation modelling overview • Tools and methods • Single and Multi-Frequency Networks • RF Network design • Interference modelling and analysis theory • Local DAB+	Dr Les Sabel
1430-1520	**Hands-On design session – Part 1** • Objectives	Dr Les Sabel
1520-1530	**Discussion and review of the day**	Dr Les Sabel

11 July: Day 4 - Thursday		

0900-1030	**Planning Part 3: RF planning and interference - Practice**
	
	• Worked examples of specific situations
	• Coverage planning
	• Interference assessment
	    ○ Co-Channel – DAB+ / DAB+
	    ○ Adjacent Channel Interference DAB+ / DAB+
	    ○ Adjacent Channel Interference DAB+ / DTV
	• Country coordination
		Yahya Khaled, ATDI

1030-1100	Coffee Break	
1100-1200	**Planning Part 4: Network design, continued** • Connectivity options and link capacity • Cost benefit analysis	Dr Les Sabel
1200 – 1230	**Hands-On design session – Part 2** • Group work period	Dr Les Sabel
1230-1330	Lunch break – Headend system demonstration	
1330– 1420	**Hands-On design session – Part 2, continued** • Group work period	Dr Les Sabel
1420– 1430	**Transfer to RTM building**	
1430– 1700	**Radio Televisyen Malaysia facilities tour**	
1700-1710	**Discussion and review of the day**	Dr Les Sabel
12 July: Day 5 - Friday		
0900-0945	**Planning Part 2: Regulation and policy** • What do regulators do and why do we need them? • Regulation and public good • Examples from ASEAN and other countries/regions • National, Commercial and Community interests • Government support and rewards • The whole ecosystem • Digital Switch Over / Analogue Switch Off	Dr Les Sabel
0945 – 1030	**Next steps to move forward** • Regulation • Collaboration and commercialisation • Rollout timing, geography and cost	Dr Les Sabel
1030-1100	Coffee Break	
1100-1230	**Hands-On design session – Part 3** • Group work period – design finalisation	Dr Les Sabel

1230-1430	Lunch Break	
1430-1515	**Hands-On design session – Part 4** • Presentations	Dr Les Sabel
1515-1530	**Review of the workshop and Q&A session**	Dr Adnan Salhab Dr Les Sabel
1530-1600	**Evaluation and Closing Ceremony**	