Spectrum Reality

InterComms talks to Dr. Haim Mazar, Vice-Chairman of ITU-R Study Group 1 (Spectrum Management)

Dr. Haim Mazar (Madjar) serves as Deputy Director, RF Spectrum and Licensing at the Israeli Ministry of Communications. He was re-elected as the vice-chairman of ITU-R Study Group 1 (Spectrum Management) by 102 countries at the Radio Assembly 2012. He has experience spanning more than 40 years in regulatory activities, wireless communications, broadcasting and spectrum management. Dr. Mazar has travelled to five continents to teach and consult on RF spectrum management. He served as vice-chairman of the technical/ administrative RRC-06/GE-06 committee, and co-chaired the ITU-R Radio Local Area Network RLAN (Wi-Fi) joint group. In addition to ITU-D and ITU-T, for more than 21 years, Dr. Mazar contributed to all ITU-R Working Parties: engineering and regulatory issues on spectrum management (spectrum control, spectrum monitoring, radio frequency interference). Additional contributions on broadcasting, cellular, fixed service, antennas, satellites, propagation...; about 130 technical contributions to ITU-R.

Dr, Mazar has also co-authored a book "Radio Spectrum Management: Policies, Regulations and Techniques" with Tony Azzarelli.

Dr. Mazar received his BSc in electrical engineering from the Technion, Haifa, Israel in 1971; an MBA from Bar-Ilan University in 1988; and a PhD from Middlesex University, London, UK in 2008, focusing on regulatory frameworks for wireless communications.

Q: The ITU-R is the international body regulating RF spectrum management. What are the main problems that are affecting this area and how is instructing critical in overcoming them?

A: Wireless communications require a relatively benign radio frequency (RF) environment in order to operate. Hence, the RF spectrum needs to be managed in order to avoid interference between users, as well as within the same system. It is imperative to regulate the scarce RF spectrum at international, regional and national levels. Engineering, regulatory, economic, legal and policy-making aspects are involved. Instruction is central to disseminate the experience and knowledge of the different spectrum management disciplines.

Q: Some background information: what has RF spectrum evolved from and who needs this knowledge?

A: The RF spectrum is technological in nature; it also involves policies and regulations in managing RF spectrum in an efficient and effective manner. These topics are addressed by engineers, advocates and economists employed by national and international spectrum regulators. The earliest methodology started by a list of frequencies managed manually by national administrations, since the first Wireless Telegraph Act issued in New Zealand back in 1903. Since then radio spectrum has become a complex matter, spanning from short-wave radio communications across the world, microwave towers deployed nationally, to satellite and space communications covering wide areas in the planet, thus regularly being discussed at national, regional and international levels.

The Spectrum Management is crucial to professionals at regulatory and standardisation bodies; the communications wireless industry (suppliers and operators) need this acquaintance.

Q: You spoke about the issues between North American and European regulations at the last ITU World Telecom, have your ideas come to fruition?

A: The ideas are based on an extensive study, deriving that the most influential powers in wireless regulation and standardisation are Europe and North America. Their approaches are different. Rather than developing new regulations and standards, administrations worldwide typically follow European or North American rules. A 'rational' regulatory step for an Administration would be to 'climb atop the shoulders of giants' (also Isaac Newton). Emerging economies may decide if they develop their own technologies or adopt leading standards.

Q: How would you compare different regulators?

A: 'Okham's Razor': 'if you have to choose between competing theories, choose the simplest theory - it is most likely to be true'. So begins Leo Tolstoy's Anna Karenina: 'All happy families are alike; each unhappy family is unhappy in its own way'. As William Michaelian 'Great minds think alike'.

My explanation is "between 2 points in planar geometry there is only one simple line, but indefinite curves". Developed countries regulate similarly the RF spectrum: they ease circulation of equipment, coordinate (bi-lateral and multi-lateral) with their neighbours, are transparent, advance light-touch and are market-led; they ensure the effective (reuse) and efficient (bits/hertz) use of the RF spectrum; they decrease interference by assigning: min power, min bandwidth, highest RF. Some developing countries invent their own rules and standards.

Q: What are the main roles of the National Spectrum Management?

A: a. RF allocations to radio services; how to follow ITU Radio Regulations
b. Assignment of licence and RF to Transmission Stations
c. Avoid and solve interference
d. Advance new wireless technologies
e. Fee collection: RF License and annual fees
f. Wireless Equipment approval processes
g. Coordination with neighbouring countries
h. Notifying ITU to the Master International Frequency Register (MIFR)
i. External relations: toward ITU, international and regional organisations
j. Design long and short term utilization of RF spectrum
k. RF spectrum to public safety agencies
l. Coordinating government and military wireless services

Co-Chairing the ITU-R Joint Rapporteur Group 8A-9B (FWA), Geneva, Switzerland, Sep 2002. Photo: © Dr. Jose Costa.

Q: ITU-R study group is updating its handbooks; these are key education tools for the regulators, what are the main changes and when will they be available?

A: The reports and recommendations of ITU are free of charge. ITU handbooks are not. ITU-R SG1 has developed some best sellers, e.g. the different editions (till 2011) of the: Spectrum Monitoring, containing the latest information on all aspects of monitoring and represents a valuable reference manual for the spectrum management community. ITU-R SG1 is updating Computer-aided Techniques for Spectrum Management (CAT) and the National Spectrum Management.

Q: Due to the vast cellular penetration, the prolific cellular phone masts are becoming a prominent issue to regulators. How do you propose to reduce the human exposure to RF radiation?

A:

1) to **follow the existing ICNIRP 1998 limits** from stations and cellular handsets; as the tolerability of the human body to RF radiation is independent of geography or political borders; there is no technical justification for the different national exposure levels;
2) Prioritize the **alternative Cable and Satellite telecommunications**, in order to reduce off-air TV, wireless internet router and Fixed Wireless Access emissions;
3) Promote cellular sites' **colocation** - passive (same site, mast and antenna) and even active (same transceivers and frequencies) among operators - in order to reduce the number of the cellular base-stations and human exposure.

The views expressed in this talk are solely those of Dr. Mazar.

For more information visit: http://people.itu.int/~mazar/