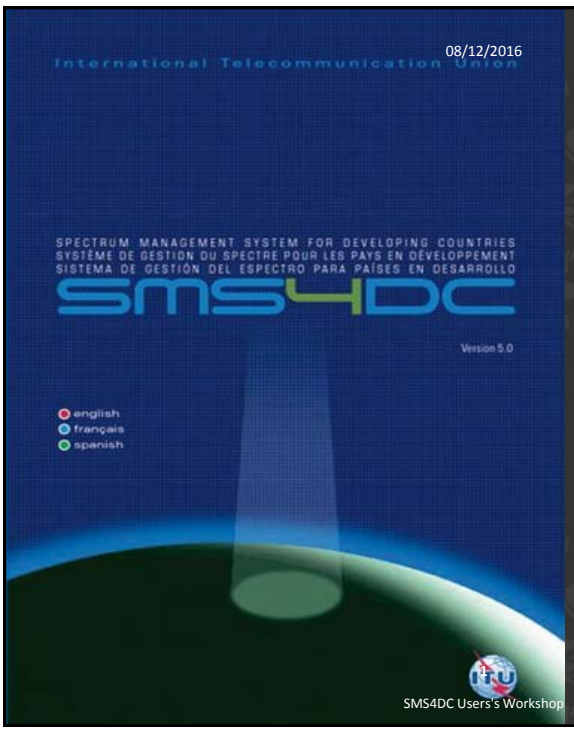

International Meeting of SMS4DC Users , 8-9 December 2016, ITU, Geneva

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Spectrum Management - background

General description of Spectrum Management (SM)

Spectrum management is the combination of administrative, scientific and technical procedures necessary to ensure the efficient operation of radiocommunication equipment and services without causing interference.

Spectrum management is the overall process of regulating and administering use of the radio frequency spectrum.

Goals of Spectrum Management

- Making the radio spectrum available for government and non-government uses to stimulate social and economic progress;
- Making efficient and effective use of the spectrum.

Objectives of SM

- to make available efficient nationwide and worldwide telecommunications services for personal and business use;
- to foster innovation in the development of infrastructures and provision of radiocommunication services;
- to serve national interests, including security and defence;

Objectives of SM cont'd

- to support crime prevention and law enforcement;
- to safeguard life and property;
- to support national and international systems for transportation;
- to foster conservation of natural resources;
- to provide for dissemination of educational, general, and public interest information and entertainment;
- to promote scientific research, resource development, and exploration.

Major national spectrum management directives/laws

- To conduct spectrum management activities in such a way that encourages efficient use of spectrum resources:
  - major directives and laws should be formulated;
  - made available to the public.
- Intent of these directives and laws is:
  - to establish a legal basis for managing spectrum use
  - to provide relevant national policy together with specific regulations.

National legal framework

- Most (but not all) national regulators have an "Act" or similar that was used to bring National Regulatory Authority(NRA) into existence and to set out their remit and powers
  - This is the "primary legislation"
- They all broadly provide the ability to licence users of spectrum, police interference and make appropriate regulations
  - This gives them the rights to generate "secondary legislation"
- They differ in the general guidance provided and in their emphasis in areas such as innovation and efficiency of use of the spectrum

Primary legislation

- It is the function of primary legislation to bring a regulator into existence and to set out the scope and remit of their powers
- It will typically cover finances such as the budget and the ability to raise revenue through spectrum fees and auctions
- There are a few tasks an NRA typically must do such as publish a National Table of Frequency Allocations (NTFA) which are typically included in the primary legislation
- Primary legislation normally outlines the key objectives such as efficient use of spectrum and promotion of innovation
  - Good legislation provides some idea of the relative priorities of the objectives and the ways in which ideals such as "efficient usage" will be measured
  - Equally, legislation needs to be flexible and far-sighted to avoid hampering the regulator or requiring frequent changes to its primary legislation

Secondary legislation – Examples

- Licence exemption (unlicensed) regulations - details of current exempted equipment.
- Licence charges regulations - current fees for licences.
- Limitation of number of licences regulations - details of the number of wireless telegraphy licences granted for which frequencies and purposes.
- Trading regulations which enable licence transfers and the publication of a transfer register.
- Register regulations which give details of licences on issue.
- Regulations which limit interference in certain equipment.
- Regulations that restrict the use of certain prohibited radio equipment.
- Regulations made from time to time when competitions (auctions) for specific awards of spectrum are commenced. These are typically announced at the time of preparing for the award.

The National Regulatory Authority

- NRAs must be independent, legally separate and receive no instruction from any body
- NRAs develop ex-ante regulations
- NRAs should conduct their affairs in an impartial and transparent way
- NRAs use public consultation to involve markets
- NRAs regulate to promote competition in downstream markets
- NRAs study markets and manage players with significant market power.

NRA Roles in SM

- allocate radio frequencies.
- encourage efficient use of the radio spectrum.
- promote access to services for all.
- work to avoid harmful interference and safeguard the spectrum.
- manage disputes between parties.
- work to achieve quality services
- promote infrastructure co-location.
- promote social development including social cohesion and safety of life.

International spectrum aspects

- International coordination and notification of radio stations to the ITU;
  - to develop radio regulations and associated procedure;
  - to encourage multilateral coordination to ensure efficient use of spectrum resources on an interference-free basis.
- Most of the administrations are part of this inter-governmental organization and plays an important role in these processes.

Development in SM

- **Spectrum management has modernised in recent years**
  - **Migration to digital**
  - **Introduction of underlay services and mitigation techniques**
  - **More sharing of spectrum**
  - **Increasing emphasis on market-based mechanisms, such as auctions and spectrum trading**
  - **More licence exempt or collective use**
  - **However……**

More to do

- The spectrum could be used more effectively and efficiently
- New technologies should be facilitated
- Too little chances for innovation and new users
- Too much and too detailed regulation
- Processes to get access are too slow

Objectives to improve SM

- Make spectrum use flexible and technology/service neutral but do not forget harmonisation
- Reduce barriers to spectrum access and the use of spectrum
- Minimise regulation
- Adapt in a timely manner to new technologies

SMS4DC preparatory Questionnaire

- In order to use the SMS4DC efficiently, a preparatory questionnaire will be sent with the pro-forma invoice from the Sales
- Based on this recommendations can be given to the administration/user if required

Content of the Questionnaire

1. What national legislation controls the management of the spectrum in the country?
2. Is this legislation publicly available?
3. What government departments have been given the authority to manage (parts of) the spectrum (by means of this legislation)?
4. Is there a National Frequency Allocation Table showing clearly how the spectrum management responsibilities have been divided between the different authorities? Will this be made available to the SMS4DC experts?
5. Are there channel arrangements in use?
6. Is there a database of actual frequency use?
7. Is there a licensing system? What application forms are used, fee structure etc.
8. What manual methods are used to assign frequencies? Are there frequency assignment and licensing policies?

Content of the Questionnaire cont'd

9. Is there a monopoly telecom operator? Are frequency bands assigned to the operator for self management?
10. If there are competing operators, how many are licensed and for what type of services: mobile phone systems, point-to-point links etc.? Are frequency (sub) bands assigned to operators for self-management?
11. What plans are there for broadcasting development? Further expansion of the analogue networks? Digital switchover date?
12. Is there a spectrum monitoring capability?
13. How many staff are involved in spectrum management? Categories: engineer, licensing/administrative. How many expected to attend the SMS4DC training.
14. What computer systems are available for SMS4DC installation (and training).
15. **The trainees have to have basic knowledge on spectrum management (e.g. wave propagation, interference calculation, licensing process)**

SM Master Plan Project

- **Increasing need of efficient spectrum management**
  - Many countries adopted new approaches: unified licensing, market based spectrum allocation, technical neutrality, cognitive radio systems
  - Requires resources and skills to update national spectrum management frameworks
- **ITU Global and Regional Objectives**
  - ***WTDC-14 Dubai Action Plan Objective 2:*** To foster an enabling environment for ICT development and foster the development of telecommunications/ICT networks, including enhancing awareness and capability of countries in the fields of spectrum planning and assignment, spectrum management and radio monitoring
- **Project with MSIP (Republic of Korea)** in ASP and Caribbean

Objectives and Targets

- To assist governments and regulators of developing countries in developing national spectrum management master plans
- For beneficiary countries
  - Assessment of the spectrum management scheme: spectrum policy, spectrum use, authorization, spectrum sharing, spectrum monitoring…
  - Provision of advices concerning each beneficiary country's development of relevant policies, legislations and regulations based on request and interest of the countries
- Human capacity building [seminars, workshops]
- Provision of guidance during implementation of the master plans, where requested by beneficiary country and agreed by ITU

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Roles and Responsibilities

- ITU
  - Selection of beneficiary countries, recruitment of experts, provision of staff resources for overall project management, approval of the report
  - Organizing the Seminars
- MSIP
  - Cash contribution
  - Collaborate with ITU in the selection of countries and experts
- CTU (for Americas region only)
  - Recommend beneficiary countries and experts
  - Comments on the scope of the reports, seminars and the contents of the reports
- Beneficiary Countries
  - Designate a qualified counterpart work with ITU
  - Provide access to the relevant information and materials
  - Provide administrative support including staff, visa, premises for the interview and training, etc.

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Report Framework (1)

Executive summary

1. Introduction

1.1 The context and scope for the study
1.2 Report contents

2. Global trends in Radio Spectrum Management

2.1 Administrative processes
2.2 Existing and new licensing policies (including DSA, LSA, white space)
2.3 Fees
2.4 Market mechanisms
2.5 Policy in respect of non-commercial use

3. Current Spectrum Management Framework

3.1 Legislative framework
3.2 Process (including internal coordination with stake-holders)
3.3 Licensing
3.4 Spectrum fee

Report Framework (2)

3.5 Monitoring, type approval and enforcement
3.6 Cross-border frequency coordination
3.7 Spectrum policy, management issues and strategy (if exists)

4. Current spectrum demand and issues - by sector/service

4.1 Data sources used in analysis
4.2 NTFA (National Table of Frequency Allocation)
4.3 Analysis of current spectrum use
4.4 Issues identified by Stakeholders in relation to frequency use
4.5 Conclusions, issues to deal with during the assistance

5. Future demands for spectrum

5.1 Spectrum Demand Trends by Sector/Service

6. Recommendations and Key issues

6.1 Allocation Policy
6.1.1 Improving information on spectrum allocations and policy
6.1.2 Making allocation decisions

Report Framework (3)

6.1.2.1 Role of ITU and other international and regional organizations
6.1.2.2 Role of local investors and spectrum users
6.1.2.3 Unique needs of the country
6.1.2.4 Cross-border frequency coordination agreements
6.1.3 Consultation arrangements
6.1.4 Balance between government and commercial allocations
6.2 Assignment , licensing, monitoring and enforcement
6.2.1 Policy principles
6.2.2 Licensing policy and fees
6.2.3 Planning and licensing processes
6.2.4 Monitoring, type approval and enforcement processes
6.3 Spectrum management strategy
6.4 Capacity building

Annexes
Abbreviations

THANK YOU !!

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