Overview on Spectrum Planning

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Spectrum Planning

- ✓ The ability to take full advantage of the spectrum depends heavily on the national spectrum management activities established within the country;
- ✓ One of the main aspects is spectrum planning:
  - ✓ It is the process of setting spectrum management goals for the future and to establish steps to achieve those goals;
  - ✓ It provides a framework within which spectrum is made available for the constantly evolving radio spectrum needs, and the spectrum management system;
  - ✓ It facilitates decision-making by creating the basis for consideration and evaluation of the course of action;
  - ✓ It must support and follow the major directions and needs of the current and future spectrum users.

Spectrum Planning

✓ The purpose of spectrum management planning is to optimize accommodation of users through the:

   ✓ Development and implementation of an effective spectrum management organization;

   ✓ Development and implementation of spectrum policies, rules and regulations;

   ✓ Establishment of capabilities that promote efficient and effective spectrum use;

   ✓ Allocation of spectrum to radio services and radio applications; and

   ✓ Organization, structuring and authorization of specific radio systems or services.

Spectrum Planning

✓ For example:

  ✓ Mobile spectrum needs will increase over 5 to 10 years
  ✓ The spectrum management process should attempt to anticipate those developments and ensure that adequate spectrum will be allocated to the mobile service to meet those needs;
  ✓ To achieve this goal:
    ✓ Capability analysis, coordination procedures, frequency shifts and supporting databases are necessary to be able to support the accommodation of mobile systems.

Spectrum Planning

- ✓ The most important element for spectrum planning is the national table of frequency allocation.
- ✓ It is important that this table be derived from the International Table of Frequency Allocations of the Radio Regulations (Art.5)
  - ✓ Even though administrations may allocate frequencies according to their national needs, frequencies do not stop at the board;
  - ✓ Frequencies should be assigned to compatible services especially near the boarders in order to avoid harmful interference.
- ✓ Good planning is crucial for the economic and social benefits;
- ✓ It can facilitate radiocommunication growth especially when the demand for spectrum increases, for preventing interference and for the identification of spectrum for future needs.

Spectrum Planning

✓ Considering that the use and technology development in this domain is dynamic - how can long term planning be efficient?

  ✓ Any commitment to long term planning must include a commitment to a process of regular revision and review in which mangers regularly reconsider plans in the light of developments;

    ✓ It is possible that a projected service will not develop as anticipated for technological or economical reasons;

  ✓ It should not be rigid and dogmatic:

  ✓ It should avoid irreversible decisions, but should survey a long period of time to set out a path to achieve spectrum management objectives;

Planning Processes

- ✓ Cover any of the spectrum management actions or decisions that directly govern how spectrum will be used, such as:
    - ✓ Allocations, policies, allotments, assignment rules and standards;
    - ✓ Actions in each of these areas determine how bands will be used, how radio services are implemented, which technologies will be accepted or if the market alone decides which technologies prevail;
- ✓ The national allocation table serves as the primary plan for spectrum use and other planning actions form subsets of that framework;
- ✓ Planning should take into account factors such as:
    - ✓ Major spectrum shifts (re-farming);
    - ✓ Emerging technologies;
    - ✓ New services for which there are no current allocations;
    - ✓ User plans for changes in use;
    - ✓ Projected crowding in specific bands;
    - ✓ Any changes due to WRC (changes made to Art 5)

Planning Processes

- ✓ Factors that may influence spectrum planning:
  - ✓ Policy and legal factors:
    - ✓ National radiocommunication laws, regulatory requirements, ITU frequency allocation table, user needs, security and public safety, regional frequency management bodies, standardization policy, etc.
  - ✓ Economic factors:
    - ✓ Globalization, market needs and marketing issues, spectrum auctions or fees, procedures and practices used by service providers, overall economic growth, etc.
  - ✓ Social and ecological factors:
    - ✓ Changes in demand as a result of changes in social structure, electromagnetic pollution and radiofrequency interference, etc.
  - ✓ Technical factors:
    - ✓ User mobility, signal processing, communication media, coding and modulation techniques, antenna design and characteristics, etc.

Planning Processes - Objectives

- ✓ Important to identify and establish objectives. To do so, it requires
  - ✓ Optimizing the use of the radio spectrum:
    - ✓ Potential growth of existing radio services;
    - ✓ Introduction and growth of new services and applications;
    - ✓ Changes in use of spectrum by industries, businesses, government and the general public.
  - ✓ Including inputs from local and national government agencies, relevant industries and from all appropriate geographically-dispersed interests;
  - ✓ An evaluation of any current national spectrum planning processes and elements to determine strengths and weaknesses as perceived by industry and government.
- ✓ The outcome of these evaluations will form the basis of establishing the planning objectives.

Planning Processes – Elements to consider

- ✓ Inventory of spectrum users and to identify what spectrum is available
  - ✓ The number of spectrum users, relevant characteristics of the radio stations, geographical distribution of the radio stations, potential influence of the radio stations on one another.
- ✓ Evaluate the current use based on the national frequency register. This register should contain technical and management information, such as:
  - ✓ Frequency, user name, location, equipment used, costs involved with system implementation and details of technical characteristics;
- ✓ If used for international communication, the national register should be supplemented by the BR IFIC;
- ✓ Information obtained through spectrum monitoring onthe actual use of frequencies to supplement the national register;
- ✓ Exchange of information with other administrations as it will have an impact on spectrum users outside the national borders;

Planning Processes – Elements to consider

✓ General consultative inquires as it allows the gathering of a wide range of information on specific topics such as frequency ranges and other provisions of radio services;

✓ Future national and international uses of the spectrum;

✓ International trends which can be crucial to plans involving future use. These trends can be identified through professional literature, through direct consultation with businesses or government representatives of other countries or through participation in ITU-R study groups and WRCs;

✓ Spectrum use forecasts is also another way of understanding the future use of the spectrum. Forecasting can be defined as the processes and methods of estimating spectrum requirements based on projection.

Final remarks

✓ In order to have an optimum use of spectrum, it is important to have a well structured national spectrum management system;

✓ Spectrum planning is definitely an important activity within it;

✓ It is important that the spectrum planning processes:

  ✓ Are not rigid as the radiocommunications environment is dynamic;

  ✓ Irreversible decisions should be avoided as much as possible;

  ✓ Any commitment to long-term planning must include a commitment to a process of revision in which mangers regularly reconsider plans in the light of developments.

✓ Important to keep in mind international trends, future spectrum use and to take into consideration the national register and monitoring information on the actual use of the spectrum.

Thank you for your attention!

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