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### **III. MANAGEMENT OF THE RADIO FREQUENCY SPECTRUM**

The Communications Regulation Commission is responsible for the effective management and use of the radio frequency spectrum, one of the key national natural resources. Its optimal management is a prerequisite for ensuring of a competitive environment for development of the telecommunications networks using radio frequency spectrum, for creation of conditions for introduction of new technologies as well as meeting the consumers' demand for new services with better quality. Easy and quick access to the radio frequency resource, maximizing the economical and social benefits, use of the spectrum in accordance with the national and international requirements – these are some of the main goals the Commission is seeking in the management of the radio frequency spectrum.

A main tool related to this management is the National Plan for Allocation of the Radio Frequency Spectrum in radio frequencies and radio frequency bands for civil needs, for the needs of the national security and defence, as well as for shared use between them. The allocation of the spectrum in the plan is in accordance with the Radio Regulations of the International Telecommunications Union, the European Table of Frequency Allocations and Utilizations (ERC/Report 25) and the Joint NATO agreement for the allocation of the frequencies for civil needs and for the needs of the defence, which is a guarantee for its harmonized use. CRC manages the radio frequency spectrum allocated for civil needs in accordance with its capacity, with the Principles and the Regulatory policy for management of the radio frequency spectrum allocated for civil needs, with the ordinances for determining the rules of procedure and the technical parameters for operation of the radio services as well as in compliance with the rules for use of the radio frequency spectrum in the European Union and in the International Telecommunications Union, observing the principles of transparency, non-discrimination, predictability, proportionality, objectivity and publicity.

In view of the great variety of short range radio devices and their rapid entering on the market an amendment and supplement of Ordinance No. 14 about the terms and conditions to carry out telecommunications through radio equipment and networks of radio equipment for own needs using radio frequency spectrum for common utilization was prepared, in accordance with the National plan for allocation of the radio frequency spectrum and Recommendation ERC/REC 70-03 of the Electronic Communications Committee. With the update of the ordinance new frequencies and radio frequency bands were identified for short range radio devices as well as technical and operational requirements for their work with the aim of implementing them in our country and harmonizing the use of the radio frequency resource for these radio devices.

#### **1. PLANNING, ASSIGNMENT AND EFFECTIVE USE OF THE RADIO FREQUENCY SPECTRUM**

CRC performs the planning of the radio frequency spectrum identified for civil needs so that to ensure its effective and interference-free usage. The assignment of frequency resource to telecommunications operators takes place after study of the technical feasibility of performing telecommunications through telecommunications networks with individually assigned frequency resource for each specific case regarding electromagnetic compatibility and health hazards, after national coordination and agreement of all the interested state bodies and authorities – and if needed after international coordination.

In view of the significance and the great variety of short range radio devices, their rapid entering on the market and in compliance with the National plan for allocation of the radio frequency spectrum and Recommendation ERC/REC 70-03 of the Electronic Communications Committee, the Commission prepared an amendment and supplement of Ordinance No. 14 about the terms and conditions to perform telecommunications through radio equipment and networks of radio equipment for own needs using radio frequency spectrum for common utilization. With the update of the ordinance new radio frequencies and radio frequency bands for short range radio devices have been identified as well as the technical conditions for their operation with the aim of introducing them in our country and harmonization of the use of the radio frequency resource for these radio devices.

##### **1.1. Mobile radio service**

In 2006 planning was performed of radio frequency spectrum for its assignment to different authorities and companies for carrying out telecommunications through private telecommunications mobile network PMR with national and local coverage and through telecommunications mobile network for paging. As a result of the planning and after carrying out national coordination (according to the provisions of the

Telecommunications Act) with all interested bodies and authorities 1142 frequencies were assigned to telecommunications operators.

In order to have effective use of the spectrum a repeated planning and reassignment of the radio frequency resource assigned for use to the telecommunications operators was performed. In connection with a clause of the individual licenses for carrying out telecommunications through private telecommunications mobile network PMR, with assigned for use radio frequency resource from the ranges 50 MHz, 60 MHz, 150 MHz and 400 MHz, for transition from radio channel bandwidth 25 kHz to 12,5 kHz, the prevailing part of the issued licenses were amended.

After the planning of the frequency range 420 MHz carried out in 2006 and the national coordination with all interested authorities of the radio frequency bands 412,5-414 MHz and 422,5-424 MHz, CRC declared intention to issue an individual license to carry out telecommunications through public telecommunications mobile network under the TETRA standard with national coverage and a term of 20 years. Within the announced period intention was declared by only one candidate and as a result frequency resource 2 x 1,5 MHz was assigned to "KAN" Ltd.

During the same month the Commission announced intention to issue an individual license for assignment of the geostationary orbital position (50,4±10)°, identified for the Republic of Bulgaria by Appendix 30B to the Radio Regulations of the International Telecommunications Union for a satellite system of the fixed satellite service BUL00000 with national coverage. Within the announced term intention was declared by only one candidate and the right to obtain an individual license was given to „BALKANSAT" Ltd.

### **1.2. Fixed radio service**

The trend continues for a significant growth of the traditional for this service networks of the type "point-to-point" (radio relay networks). Frequency planning and national coordination was performed for 3188 radio relay links, which is a 47,87% increase compared to 2005. CRC also approved the technical projects of 391 radio relay links. There was again great dynamics in the development of the fixed service networks of the mobile operators – the number of the radio relay links of „MOBILTEL" Plc has increased with 9,7%, of „COSMO BULGARIA MOBILE" Plc with 61,6% (the company already has the biggest radio relay network in the country), of „RADIOCOMMUNICATION COMPANY" Ltd with 37,3% and of „BTC MOBILE" Ltd with 130,9%. The increase registered in the number of radio relay links in the network of the „BULGARIAN TELECOMMUNICATIONS COMPANY" Plc was 12%. The analogue radio relay network decreased with 130 links and the main part of the remaining analogue network is concentrated in the transfer of television signals. Due to the increased interest a significant amount of radio frequency spectrum was planned and assigned for use by networks of the type „point-to-point" providing high-speed data transfer (with digital rate not less than 155 Mbit/s). The increase for these operators compared to 2005 is 14,7%.

In 2006 the Commission reassigned and made a new planning of part of the radio frequency spectrum allocated for the fixed radio service in the range 26 GHz, thus providing the opportunity for a more effective use of the frequency resource for networks of the type "point-to-multipoint" and creating conditions for the introduction of new technologies. Thanks to the declared significant interest by the operators CRC announced a sealed bid tender for issuing of individual licenses with national coverage and a term of 15 years for carrying out telecommunications through public telecommunications networks in the fixed service of the type „point-to-multipoint" in the range 26 GHz. A more flexible format was applied at the tender allowing the candidates to choose on their own how many of the available 25 duplex channels of 28 MHz they want to be assigned to them. They were allowed to apply for not less than two and not more than six duplex channels including a duplex channel for guard band. After checking the submitted applications for participation at the tender it was identified that the available frequency resource is sufficient to meet all the submitted applications and it was decided a *total of 20 pairs of 28 MHz duplex channels* frequency resource to be assigned.

### **1.3. Fixed satellite service**

In 2006 the Commission provided radio frequency resource to carry out telecommunications through networks in the fixed satellite service to three new operators and made 24 amendments of the technical parameters of licensed networks. National coordination and agreement of all interested state bodies and authorities was reached for 4 stations of public networks and 4 stations of private networks were nationally coordinated.

### **1.4. Positions of the geostationary orbit**

<sup>1</sup> 12th Report on the Implementation of the Telecommunications Regulatory Package, 2006

In January 2006 CRC announced intention to issue an individual license for assigning of position minus 1.2° of the geostationary orbit, allocated to the Republic of Bulgaria by Appendices 30 and 30A of the Radio Regulations of the International Telecommunications Union for a national satellite broadcasting system BUL02000 with national coverage. Within the announced term applications were received from two candidates which resulted in an announced competitive procedure for which three applicants have submitted documents. With the issued individual license 10 satellite channels have been assigned to „BULSATCOM” Plc, each with a bandwidth of 27 MHz in the frequency ranges 11,7-12,5 GHz (space - Earth) and 17,3-18,1 GHz (Earth - space).

During the same month the Commission announced also intention to issue an individual license for assigning the position (50,4±10)° of the geostationary orbit, allocated to the Republic of Bulgaria by Appendix 30B of the Radio Regulations of the International Telecommunications Union for a satellite system in the fixed satellite service BUL00000 with national coverage. Within the announced term intention was declared only by one candidate and the right to obtain an individual license was given to „BALKANSAT” Ltd. The radio frequency bands 4500–4800 MHz (space - Earth), 6725–7025 MHz (Earth - space) of the C band and 10.7–10.95 GHz and 11.2–11.45 GHz (space - Earth) and 12.75–13.25 GHz (Earth - space) of the Ku band were provided for use to the company.

## **1.4. Broadcasting**

### **1.4.1. Analogue broadcasting**

In 2006 CRC specified frequency channels for design and construction of new television stations for the networks of BNT, bTV and NOVA TV, for which 23 frequency assignments were made. 56 frequency assignments were made in the VHF FM range 87.5-108 MHz for the national networks of BNR and DARIK RADIO.

CRC determined and provided information about 82 frequencies and the respective parameters for terrestrial broadcasting of radio signals to the Council for Electronic Media for announcing and holding of competitions according to the provisions of the Radio and Television Act.

National coordination and agreement of all interested bodies and authorities was reached for 461 frequency assignments and technical parameters for radio and television broadcasting. 98 technical projects for construction of transmitting stations of licensed broadcasting operators were approved, 16 of them for national operators and 115 working projects for television broadcasting, 56 of which for national operators.

### **1.4.2. Digital broadcasting**

The development of the new technologies in the broadcasting area, mostly the trend for analogue to digital transition was the main reason for holding the Regional Radio Conference RRC/04-06 of the International Telecommunications Union for planning of terrestrial digital broadcasting. The main task of the conference was the preparation and adoption of a long term plan for allocation and assignment of radio frequency channels for terrestrial digital broadcasting in the ranges 174-230 MHz and 470-862 MHz. The Regional Radio Conference was held in two sessions, with intersession period of two years during which the actual planning of the radio networks for digital terrestrial broadcasting was conducted. The results of this planning were used as input data for the preparation of the plan for terrestrial digital broadcasting (Plan Geneva 2006), adopted at the second session of RRC/04-06, held from 15 May to 16 June 2006.

Within the intersession period experts from CRC developed a project of a national digital plan for terrestrial digital broadcasting, which was sent to the Radio Bureau of ITU for analysis of its compatibility with the plans of the other countries participating in the conference. After the publication of the results of this evaluation a thorough analysis was conducted in the Commission of the obtained results and the national plan was amended with the aim of providing it for the first planning exercise, which was held at the beginning of the second session of the Regional Radio Conference RRC/04-06.

In order to reduce the incompatibilities, in 2006, at the initiative of CRC, 2 meetings of the Balkan East-European Group for preliminary coordination of the frequency plans for introduction of terrestrial digital broadcasting were held, during which extensive review and analysis of the presented drafts of frequency plans of the Balkan countries were made. At the last meeting the plans of the participating countries were coordinated and adopted and an agreement was signed, according to which each country, including Bulgaria, presented to the International Telecommunications Union its plan for terrestrial digital broadcasting coordinated at this meeting.

The main goals of the conference were to create the possibility for introduction of terrestrial digital broadcasting and achieving of maximum flexibility for the future use of the frequency resource which shall be made available as a result of the implemented effective digital technologies. With the introduction of the

terrestrial digital broadcasting a more efficient use of the frequency spectrum is ensured as well as possibilities for distribution of programs with better quality compared to the analogue, provision of new services to the end users and planning of networks for mobile and portable reception of programs.

The active participation of the Commission's representatives in the planning process contributed to a great extent for the achieving of very good results for our country and virtually all requested frequency channels/blocks at the beginning of the conference were protected and registered in the plan Geneva 2006.

**Frequency resource is ensured with possibility for construction of:**

- 10 networks for terrestrial digital broadcasting of television programs with national coverage;
- 34 networks for terrestrial digital broadcasting of television programs with regional coverage;
- 23 networks for terrestrial digital broadcasting of television programs with regional coverage for the territory of the cities Sofia (12 networks) and Varna (11 networks);
- 2 networks for terrestrial digital broadcasting of radio programs with national coverage;
- 8 networks for terrestrial digital broadcasting of radio programs with regional coverage for the cities Sofia (6 networks) and Varna (2 networks).

In connection with the introduction of terrestrial digital broadcasting in CRC was conducted analysis of the results achieved at the conference and of the present condition of the terrestrial analogue broadcasting in Bulgaria and in the neighbouring countries and as a result frequency channels were identified for starting the terrestrial digital broadcasting of television programs.

Representatives of the commission participated in the preparation of a draft document for notification to the European commission of the introduction of digital distribution of radio and television programs in Bulgaria and the discontinuation of the analogue terrestrial television broadcasting and of a draft Plan for introduction of terrestrial digital television broadcasting (DVB-T) in the Republic of Bulgaria.

## **2. ELECTROMAGNETIC COMPATIBILITY**

In order to ensure the safety of aeronautical navigation, in 2006 were conducted 300 studies on electromagnetic compatibility between VHF FM broadcasting stations and the aeronautical navigation systems ILS, VOR and COM.

In connection with the work of CRC on identifying the sources of the trans-border interference to radio and television broadcasting stations measurement protocols were analyzed for registration of signals in the radio frequency bands allocated for broadcasting and the respective conclusions and recommendations to the operators for solving the problem with this interference were made.

Experts of the Commission checked 98 technical projects for construction of transmitting stations of licensed radio broadcasting operators and 115 for television broadcasting. The technical projects of 391 radio relay links of operators of telecommunications networks in the fixed service have also been checked.