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ICTP - URSI - ITU/BDT WORKSHOP ON THE USE OF RADIO FOR DIGITAL COMMUNICATIONS IN DEVELOPING COUNTRIES

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"Radiofrequency Spectrum Management in Developing Countries: Nigeria as a Case Study"

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**RADIOFREQUENCY SPECTRUM MANAGEMENT IN DEVELOPING COUNTRIES:
NIGERIA AS A CASE STUDY.**

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1. INTRODUCTION

- MODERN TELECOMMUNICATIONS OR INFORMATION TECHNOLOGY: SLOGAN
- Evolution of a system that enables anyone , anywhere, anytime to communicate via voice, fax, video, data transmissions.
- PHYSICAL BOUNDARIES SEPARATING NATIONS, LAND, SEA, AND AIR REMOVED:
ENTIRE WORLD NOW A GLOBAL VILLAGE WITH RAPIDLY SHRINKING SIZE IN TERMS OF TELECOMMUNICATIONS NETWORK.

2. DIGITAL RADIO COMMUNICATIONS

- CENTRAL TO THE ACHIEVEMENT OF EMERGING INTEGRATED SERVICES AND NETWORKS.
- RADIOFREQUENCY SPECTRUM MANAGEMENT HAS ASSUMED GREATEST IMPORTANCE IN SYSTEMS IMPLEMENTATION.

3. SERVICES FOR WHICH RF SPECTRUM IS REQUIRED

3.1 BROADCASTING:

RADIO : MW, HF, VHF (FM)
TV : VHF/UHF (terrestrial)
MICROWAVES (satellite)

3.2 TELECOMMUNICATION:

FIXED SERVICES : Telephone, Telex, Fax

MOBILE : HF, VHF/UHF (Land, Aeronautical, Maritime)

: VHF/UHF (Cellular Mobile)

: MICROWAVES (Mobile Satellite)

4. RF SPECTRUM MANAGEMENT ORGANISATIONS

4.1 INTERNATIONAL: ITU/BR AND WRC (World Radiocommunication Conference)

⇒ RESPONSIBLE FOR :

- * Periodic reviews and revisions of the Radio Regulations (RR) in the light of new technologies applications and spectrum needs of member nations.
- * Frequency registration and coordination procedures to ensure absence of harmful interference possibilities between Radio Systems operating across international boundaries.
- SATELLITE BASED SYSTEMS ARE OF PARTICULAR CONCERN
- THE RR CONTAINS THE FREQUENCY ALLOCATION TABLE, REGULATORY PROVISIONS AND OPERATIONAL PROCEDURES.
- FREQUENCY BANDS ARE ALLOCATED TO SERVICES ON PRIMARY, PERMITTED AND SECONDARY CATEGORIES ; with one, two or more services sharing the same bands as appropriate.
- THE WORLD IS DIVIDED INTO THREE REGIONS: 1 ,2 and 3.

TABLE 1 SHOWS EXAMPLE OF FREQUENCY ALLOCATION ON EITHER REGIONAL OR WORLD-WIDE BASIS:

REGION 1	REGION 2	REGION 3
4,750 - 4,850 kHz	4,750 - 4,850 kHz	4,750 - 4,850 kHz
FIXED	FIXED	FIXED
AERO MOBILE (OR)	MOBILE except aero mobile (OR)	BROADCASTING
LAND MOBILE		Land Mobile
BROADCASTING	BROADCASTING	

4,850 - 4,995 kHz

FIXED

LAND MOBILE

BROADCASTING

Table 1 : Frequency sharing between services

- OBSERVE FREQUENCY SHARING BETWEEN FIXED, MOBILE AND BROADCASTING SERVICES.

4.2 NATIONAL

- EACH NATION IS RESPONSIBLE FOR ITS NATIONAL FREQUENCY ALLOCATION IN THE CASE OF RR SHARED BANDS.
- EACH NATION IS RESPONSIBLE FOR FREQUENCY ASSIGNMENT TO INDIVIDUAL RADIO STATIONS.
- OBJECTIVE IS TO ACHIEVE RELIABLE, EFFICIENT, EQUITABLE FREQUENCY OCCUPATION AND UTILIZATION FREE OF HARMFUL INTERFERENCE BETWEEN SERVICES.

- SIZE AND COMPLEXITY OF FREQUENCY DEMANDS REQUIRE APPLICATION OF COMPUTER-AIDED DATA BASES FOR OPTIMUM ALLOCATION AND ASSIGNMENT AS WELL AS MONITORING.

5. RF SPECTRUM MANAGEMENT IN NIGERIA

5.1 ORGANISATIONAL SET-UP

- FEDERAL MINISTRY OF COMMUNICATIONS (MOC) IS THE GOVERNMENTAL AUTHORITY FOR MANAGEMENT AND CONTROL OF TELECOMMUNICATIONS MATTERS INCLUDING FREQUENCY MANAGEMENT.
- A DIVISION IN MOC (TECHNICAL SERVICES DIVISION, TSD) WITH SKELETAL STAFF AND MANUAL OPERATIONS IS RESPONSIBLE FOR RF SPECTRUM MANAGEMENT. THEREFORE, THE MANAGEMENT IS INEFFICIENT. NO NATIONAL FREQUENCY ALLOCATION TABLE AND NO OBVIOUS TECHNICAL BASIS FOR FREQUENCY ASSIGNMENT. FREQUENCY IS SOLD TO APPLICANTS ON FREQUENCY BAND AND BANDWIDTH BASIS. IT IS DIFFICULT TO UNDERSTAND THE BASIS OF FEES CHARGED, BUT THE SPECTRUM ADMINISTRATOR MEASURES THE MANAGEMENT EFFECTIVENESS IN TERMS OF REVENUE GENERATED!
- UNTIL RECENTLY (1992), THE NIGERIAN TELECOMMUNICATIONS LIMITED (NITEL), A GOVERNMENT PARASTATAL, HAD THE SOLE MONOPOLY FOR PLANNING, INSTALLATION, OPERATION AND MAINTENANCE OF ALL TELECOMS INFRASTRUCTURE.
- HOWEVER, IN 1992, GOVERNMENT SET UP TWO COMMISSIONS: THE NATIONAL BROADCASTING COMMISSION (NBC) AND THE NIGERIAN COMMUNICATIONS COMMISSION (NCC) AS REGULATORY AND CONTROLLING BODIES FOR THE DEREGULATED BROADCASTING AND TELECOMS SERVICES, RESPECTIVELY.

- THE FUNCTIONS OF THESE TWO COMMISSIONS AND THOSE OF THE MOC HAVE INADVERTENTLY COMPLICATED THE PROBLEM OF EFFECTIVE FREQUENCY MANAGEMENT: the NBC is empowered to allocate broadcast frequencies to radio and TV stations; the NCC to license operators of radio based services without power to assign frequencies.
- A TRIPARTITE CONFLICT SITUATION IN FREQUENCY MANAGEMENT HAS THEREFORE ARISEN THAT REQUIRES URGENT RESOLUTION.

5.2 PROPOSAL TO ESTABLISH FREQUENCY MANAGEMENT BOARD (FMB)

- NIGERIA IS CURRENTLY REVIEWING ITS TELECOMS POLICY.
- THE ISSUE OF RF SPECTRUM MANAGEMENT IS A VERY IMPORTANT ASPECT OF A GOOD POLICY FRAMEWORK THAT MUST STAND THE TEST OF TIME.
- IT IS PROPOSED THAT AN FMB BE SET UP INDEPENDENT OF EXISTING BODIES, WITH MEMBERSHIP DRAWN FROM MAJOR INTEREST GROUPS IN MATTERS RELATING TO RF SPECTRUM MANAGEMENT.
- THE FMB IS TO BE RESPONSIBLE FOR THE PLANNING, COORDINATION, ALLOCATION, ASSIGNMENT, REGISTRATION AND MONITORING OF THE SPECTRUM.
- THE BOARD TO BE SERVICED BY COMPETENT TECHNICAL AND ADMINISTRATIVE SUPPORT STAFF EQUIPPED WITH COMPUTER AIDED RESOURCES AND ADEQUATE FUNDS TO PERFORM EFFECTIVELY.
- THE FMB PERSONNEL TO EFFECTIVELY PARTICIPATE IN RELEVANT ITU CONFERENCES, SEMINARS, WORKSHOPS, STUDY GROUPS AND WORKING PARTIES SO AS TO BE ABREAST OF WORLD-WIDE DEVELOPMENT IN TELECOMS SYSTEMS, AND BE CAPABLE OF UNDERTAKING RELEVANT R & D IN SUPPORT OF NATIONAL TELECOMS DEVELOPMENTS.

6. CONCLUSION

- THE NIGERIAN SITUATION WITH REGARDS TO INEFFECTIVE MANAGEMENT OF THE FREQUENCY SPECTRUM IS BY AND LARGE TRUE OF MOST DEVELOPING COUNTRIES.

THE FOLLOWING ARE TYPICAL PROBLEMS:

- ⇒ ABSENCE OF AN EFFECTIVE BOARD OR AUTHORITY (e.g. like FCC in USA or RA in UK)
 - ⇒ LACK OF FUNDS, TECHNICAL PERSONNEL AND KNOW-HOW.
 - ⇒ LACK OF EQUIPMENT, PARTICULARLY COMPUTER RESOURCES.
 - ⇒ LACK OF COLLABORATION BETWEEN GOVERNMENTAL ADMINISTRATIONS , PRIVATE OPERATORS AND ACADEMICS.
 - ⇒ ISOLATION FROM INTERNATIONAL INTERACTIONS, PARTICULARLY FROM OTHER DEVELOPING COUNTRIES.
 - ⇒ APPARENT APATHY FROM GOVERNMENT OR LACK OF INTEREST OR APPRECIATION FOR THE ROLE THAT TELECOMS CAN PLAY IN ENHANCING OTHER SECTORS OF THE ECONOMY, HENCE THE LOW PRIORITY STATUS ACCORDED TELECOMS MATTERS.
- THE MODEL OF COLLABORATION ENGENDERED BY THIS TYPE OF ICTP-URSI-ITU/BDT WORKSHOP IS PRAISEWORTHY AND SHOULD BE ENCOURAGED TO CONTINUE.

