SPECTRUM MANAGEMENT IN THE GLOBAL VILLAGE

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TOPICS FOR DISCUSSION

• PRINCIPLES OF SPECTRUM MANAGEMENT
• WHAT IS SPECTRUM MANAGEMENT?
• HOTTEST TOPICS
• NATIONAL SPECTRUM MANAGEMENT HANDBOOK
• BEST PRACTICES
• SPECTRUM REFORM
• CONCLUSIONS
PRINCIPLES OF SPECTRUM MANAGEMENT

1. COMPETITION
2. MAXIMUM FLEXIBILITY
3. PUBLIC INTEREST
4. CONSTRUCTIVE LICENSING AND FEE POLICIES
5. ADMINISTRATIVE CERTAINTY WITH MINIMUM DELAY
6. NATIONAL DECISIONS IN A GLOBAL MARKET CONTEXT
WHAT IS SPECTRUM MANAGEMENT?
WHAT IS SPECTRUM MANAGEMENT?

- **LEGAL AND REGULATORY FOUNDATION**
- **SPECTRUM MONITORING**
- **LAW ENFORCEMENT**
- **SPECTRUM PLANNING AND ALLOCATION**
- **INSPECTION OF INSTALLATIONS**
- **SPECTRUM ENGINEERING**
- **LICENSING, ASSIGNMENT, AND BILLING**
- **REGULATIONS AND STANDARDS**
- **FREQUENCY COORDINATION AND NOTIFICATION**
WHAT IS SPECTRUM MANAGEMENT?

- Legal and Regulatory Foundation
- Spectrum Monitoring
- Spectrum Planning and Allocation
- Spectrum Engineering
- Regulations and Standards
- Database
- Frequency Coordination and Notification
- Licensing, Assignment, and Billing
- Law Enforcement
- Inspection of Installations
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SPECTRUM MONITORING

DATABASE

SPECTRUM MANAGEMENT

LAW ENFORCEMENT

INSPECTION OF INSTALLATIONS

LICENSING, ASSIGNMENT, AND BILLING

FREQUENCY COORDINATION AND NOTIFICATION

SPECTRUM PLANNING AND ALLOCATION

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SPECTRUM MANAGEMENT
HOW DO WE ACHIEVE SPECTRUM MANAGEMENT?

- WORLD AND REGIONAL RADIO CONFERENCES
- GLOBAL RECOMMENDATIONS
- TECHNICAL CHARACTERISTICS
- OPERATIONAL PROCEDURES
- ELIMINATING HARMFUL INTERFERENCE
- MASTER INTERNATIONAL FREQUENCY REGISTER
- PROVIDE TOOLS, INFORMATION, AND SYMPOSIA
HOTTEST TOPICS

- SPECTRUM ECONOMICS
- BROADBAND
- SOFTWARE-DEFINED RADIOS
- TERRESTRIAL SHARING WITH GEOSTATIONARY SATELLITE NETWORKS
- ULTRA-WIDEBAND
SPECTRUM ECONOMICS

- Applies to all terrestrial, and national satellite spectrum/orbits
- Being studied, applied, and modified in many countries
- One-time application or inspection fees, periodic regulatory fees, periodic auctions, secondary markets
BROADBAND

- LARGELY DRIVEN BY THE INTERNET
- ALSO DRIVEN BY CONVERGENCE OF VOICE, VIDEO, AND DATA
- COMPETITION AMONG SATELLITE DELIVERY, WIRED TELEVISION (CABLE OR FIBRE), WIRED TELEPHONE (DSL), AND ACCESS OVER POWER MAINS
SOFTWARE-DEFINED RADIOS

- COMPUTER-DRIVEN RADIOS USING SOFTWARE RATHER THAN HARDWARE TO CHANGE FREQUENCY, MODULATION, AND POWER LEVELS
- WILL ALLOW MORE EFFICIENT USE OF SPECTRUM
- WILL ASSIST INTEROPERABILITY, PARTICULARLY FOR PUBLIC SAFETY, AND BETWEEN NATIONAL AND LOCAL OFFICIALS
TERRESTRIAL SHARING WITH GEOSTATIONARY SATELLITE NETWORKS
ULTRA-WIDEBAND

UWB SIGNAL DEFINITION:

- The fractional bandwidth is greater than 20% of the center frequency, or
- The -10 dB bandwidth occupies 500 MHz or more of spectrum.
UWB MONOCYCLE
TIME AND FREQUENCY DOMAINS

![Diagram showing UWB monocyte in time and frequency domains](image)
UWB Emission Limits

Part 15 = -41.3 dBm/MHz

-75.3 dBm/MHz

UWB Emission Limit for Outdoor Systems

Equipment must be hand-held.

U.S. LIMITS
NATIONAL SPECTRUM MANAGEMENT HANDBOOK

SPECTRUM MANAGEMENT FUNDAMENTALS
SPECTRUM PLANNING
FREQUENCY ASSIGNMENT AND LICENSING
SPECTRUM MONITORING, SPECTRUM INSPECTION AND INVESTIGATION
SPECTRUM ENGINEERING TECHNIQUES
SPECTRUM ECONOMICS
AUTOMATION FOR SPECTRUM MANAGEMENT ACTIVITIES
SPECTRUM EFFICIENCY
SPECTRUM MANAGEMENT INFORMATION ON THE ITU WEBSITE
SPECTRUM MANAGEMENT TRAINING
SPECTRUM BEST PRACTICES
SPECTRUM POLICY REFORM

FCC SPECTRUM POLICY TASK FORCE CONCLUSIONS:

- SPECTRUM ACCESS IS A MORE SIGNIFICANT PROBLEM THAN SPECTRUM SCARCITY
- TECHNOLOGY IS ALLOWING SYSTEMS TO BE MORE TOLERANT TO INTERFERENCE
SPECTRUM POLICY REFORM

FCC SPECTRUM POLICY TASK FORCE RECOMMENDATIONS:

- MIGRATE TO MORE MARKET-ORIENTED MODELS
- GIVE MORE EMPHASIS TO TIME SHARING
- ALLOW UNLICENSED SERVICES IN COMMON BANDS
- PERMIT LOW-POWER USERS HAVING SMART RADIOS TO OPERATE JUST ABOVE THE AMBIENT NOISE BUT BELOW LEVELS OF SIGNALS NEEDED BY OTHERS
CONCLUSIONS

SPECTRUM MANAGEMENT MUST BE APPROACHED ON A GLOBAL BASIS USING COMMON STANDARDS, COMMON PROCESSES, AND COMMON FREQUENCY ALLOCATIONS, SO AS TO REACH EVERY VILLAGE.

ALTHOUGH WE ARE DIFFERENT TRIBES AND DIFFERENT TONGUES, WE ARE THE SAME PEOPLE.

LET US NOT FORGET THAT TELECOMMUNICATIONS TIE US TO THE PAST, CONNECT US IN THE PRESENT, AND LINK US FOR THE FUTURE.