SPECTRUM MANAGEMENT IN A MULTI-ISLAND ENVIRONMENT

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Introduction

- The Organization of Eastern Caribbean States (OECS) became the first group of countries to create a regional body aimed at establishing the harmonization of policy approaches to spectrum management.

Introduction Cont'd

- The unified body, under treaty, established a Multi-Island organization called the Eastern Caribbean Telecommunications Authority, ECTEL, having specific responsibility, *inter alia.* for ensuring that the radio spectrum is utilized efficiently, economically and rationally in keeping with the rapid evolution of wireless technologies and services.

What Is ECTEL

- Regional Telecommunications Regulatory Advisory body for Member States
- Member States are : Dominica, Grenada, St Lucia, St Kitts and Nevis, St Vincent and the Grenadines
- Established by Treaty in 2000 May 04
- Directorate located in St Lucia

What Are Its Core Responsibilities

- To harmonize and coordinate approaches to telecommunications regulations in Member States

- To manage and regulate telecommunications services and the radio frequency spectrum

Responsibilities Cont'd

- Ensure a competitive environment for telecommunications in ECTEL member States

- Advise National Telecommunications Regulatory Commission and the governments on matters relating to telecommunications and the spectrum

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Legislative Framework

Structure

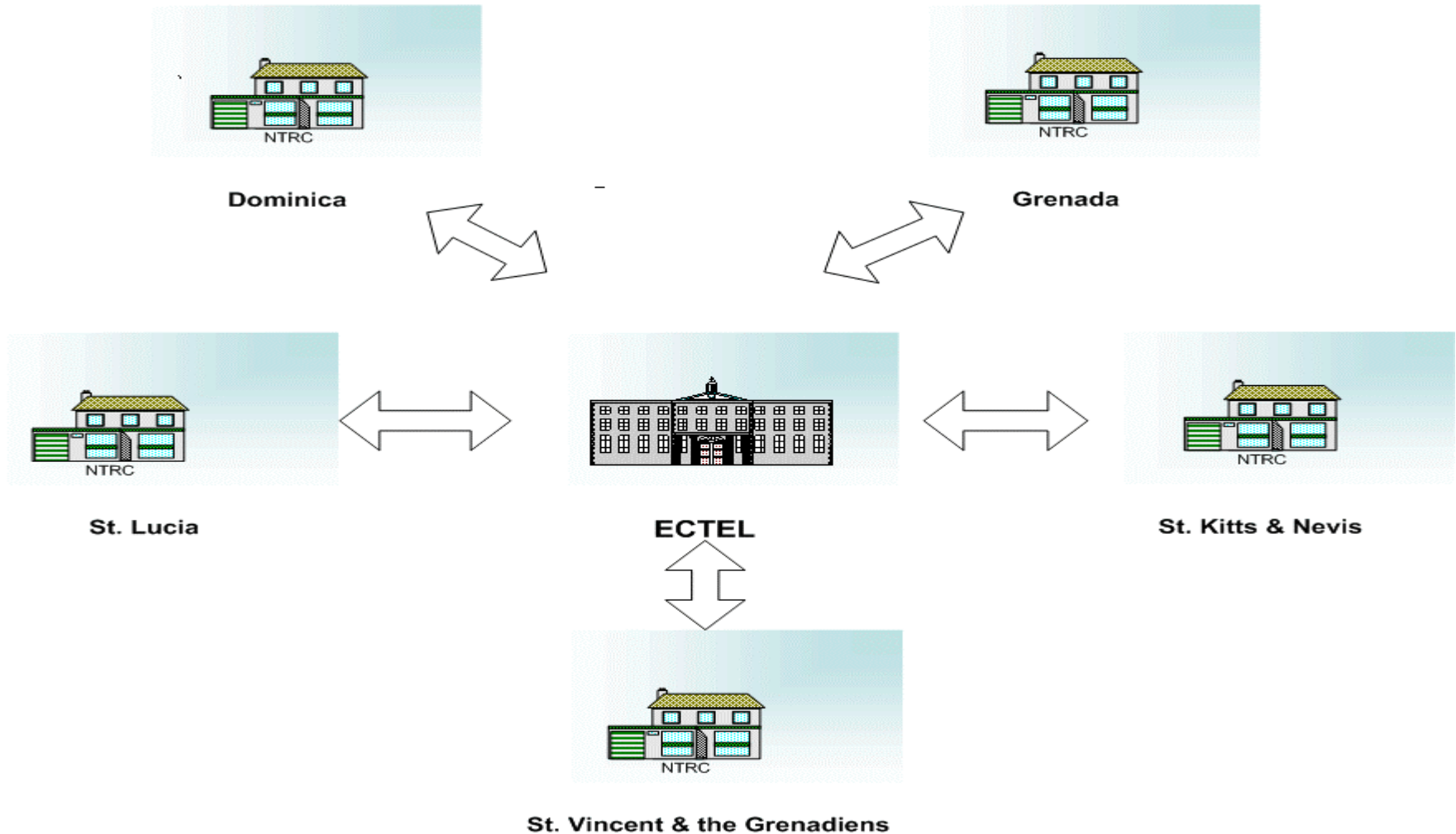- **Council of Ministers**

  Formulation of Policy

- **Board of Directors**

  Implement Policies

- **Secretariat**

  General administration of Treaty and day to day running of ECTEL

Relationship between ECTEL and NTRCs

Dominica

Grenada

St. Lucia

ECTEL

St. Kitts & Nevis

St. Vincent & the Grenadiens

Acts And Regulations

ECTEL has drafted similar Telecommunications Laws which are promulgated throughout the five islands

- These Laws Establish the Procedures for Granting of various Telecommunications Licences

Acts and regulations Cont'd

- Spectrum Management Regulation

- Fees regulation

- Licensing Regulation

- Exemption Regulation

Licensing

- Individual Licence

- Class Licence

- Frequency Authorization

- Special Licence

Spectrum Planning

Regional Spectrum Plan

- National Policy

- National Demand

- National Allocation Plan

- National Assignment Based on Regional Plan

Regional Spectrum Plan

- Regional Allocation Plan (Harmonized)

- Standardized frequency Arrangements for allocation - ITU Channel Arrangements
  - ITU-R Rec. F Series

- Link Length Policy

- Clustering of Broadcast Frequencies

Radio Spectrum Management System

Management of the radio Spectrum in ECTEL Member States is comprised of an automated spectrum management system which is established in each island.

The system has the capability to perform the following functions.

- Licensing
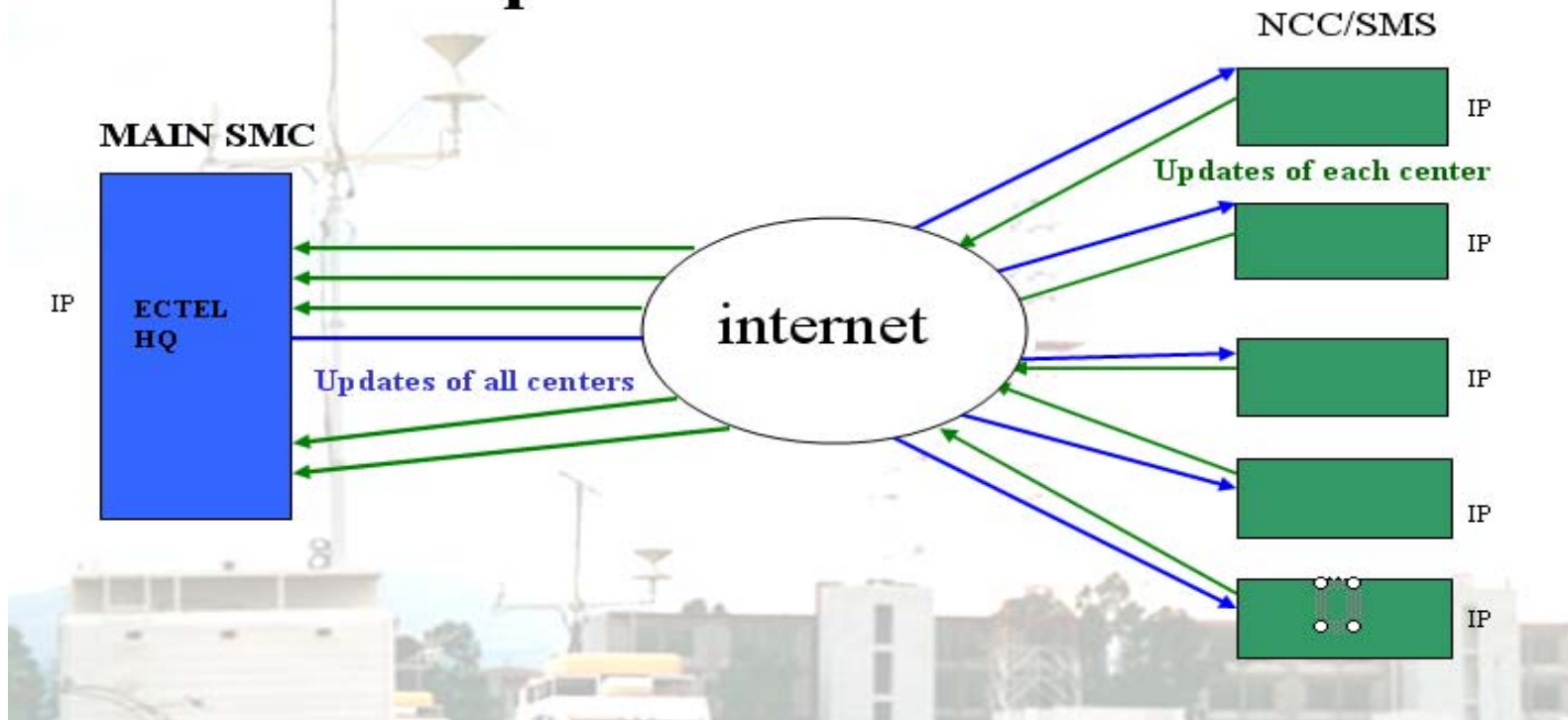- Billing
- Database Management System

Radio Spectrum Management System

- Interference Analysis

- Propagation analysis and Link Budget determination

- Frequency Allocation

Automated Spectrum Management

RSMS

Database replication

Monitoring

- Spectrum Monitoring

- Spectrum Analysis

- Channel Occupancy

- Direction Finding

Spectrum Monitoring Systems

- Spectrum Monitoring systems are the ears of any spectrum management organization

- Provide real-time information on radio usage as well as on-the-spot measurements of new and existing radio installations.

Spectrum Monitoring Systems

□ In conjunction with a <u>Spectrum Management</u> system, a monitoring system plays a key role in policing the use of the radio spectrum and making sure that effective and efficient use of this valuable resource can be controlled.

What Is Being Monitored?

- Fixed monitoring and HF direction finding

- VHF/UHF mobile and remote monitoring

- AM, FM, television, and microwave monitoring

- Fixed satellite monitoring

How Is Spectrum Monitoring Performed

- In its most basic form, Spectrum Monitoring can be conducted with a simple hand-held measuring tool

- In an advanced form, Spectrum Monitoring systems can comprise a number of remote, automated monitoring stations linked back to a central control centre for coordinated monitoring activities and analyses.

Questions Faced By the Engineer

- What geographic coverage is required?

- What range of frequencies is to be covered (HF/VHF/SHF)?

- Is operation 24/7, office hours or other mix?

- Is control centralised or regionalised?

Key Aspects Of The Spectrum Monitoring Process

- ☐ Validating information on users/proposed user. (This is stored in the IRIS data) base.

- ☐ Evaluating real levels of usage of the spectrum. (ITU and ECTEL standards)

Key Aspects Of The Spectrum Monitoring Process

- Identifying areas for further use, sharing or reallocation.

- Monitoring band occupancy:

At the allocation stage when existing band undergoes a change of use or introduction of new services.To verify removal of old services from the band or that sharing arrangements are working

- Monitoring channel occupancy:

This will confirm or detect the level of use of frequency assignments in particular channels.

Key Aspects Of The Spectrum Monitoring Process

- Resolving Problems of interference (Most common in ECTEL especially FM band)

  - Interference investigation:

  Dealing with the complaints regarding interference.

  Scanning Band for unwanted Frequency (Triangulation

Key Aspects Of The Spectrum Monitoring Process

- Compliance (routine) monitoring:

  -Routine monitoring to ensure or confirm that new users meet license conditions. Such a random and selective inspections are particularly effective in terms of improving and maintaining compliance levels.
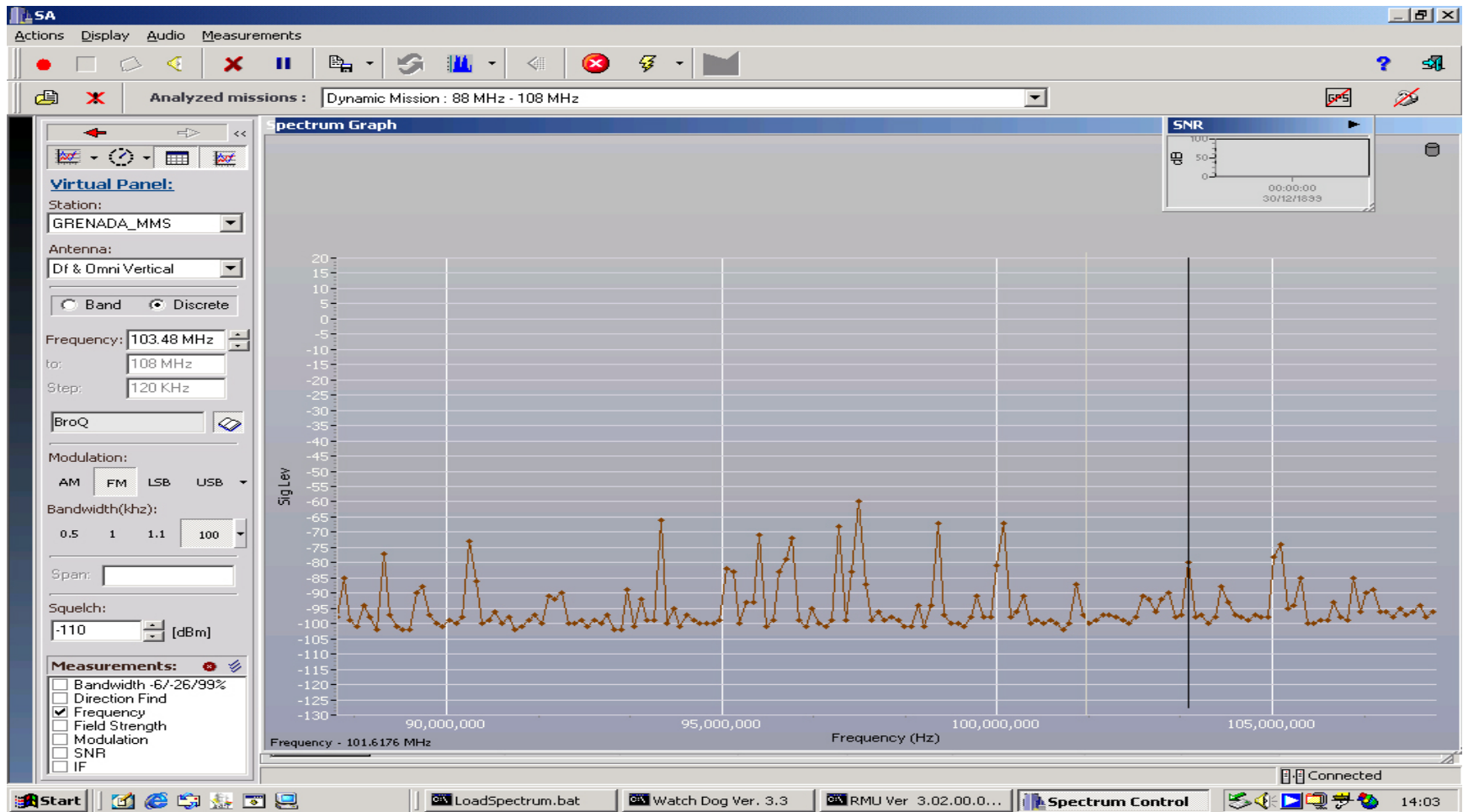
Monitoring

Mobile Monitoring Station
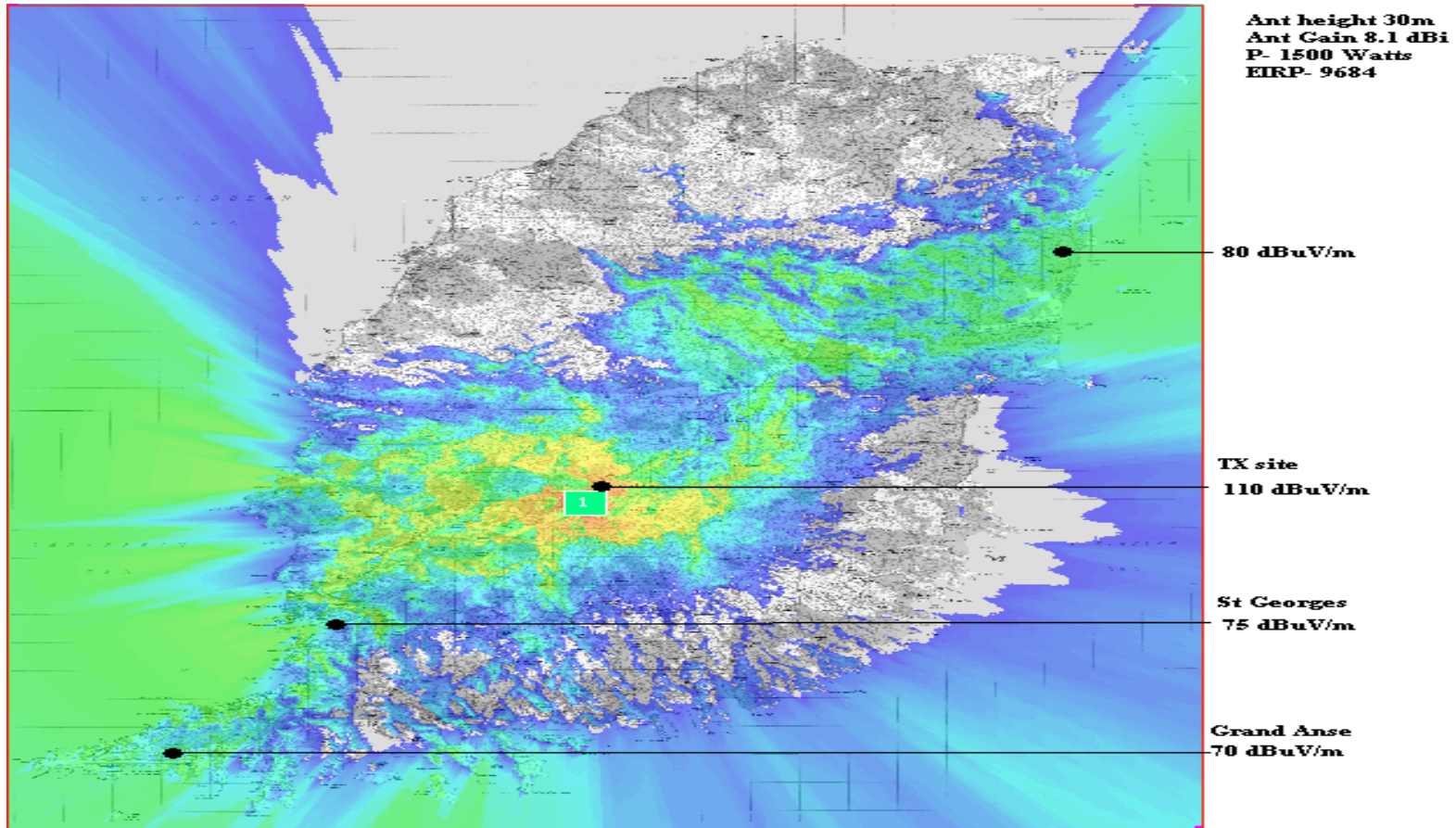
Direction Finding

Field Operation

Spectrum Analysis

FM Broadcast Band

Site Analysis

Compliance and Enforcement

- ❑ Effective regulation that mitigates inefficient spectrum usage

- ❑ Comprehensive mechanisms and resources (e.g. monitoring equipment) that facilitate monitoring operator compliance and enforcing regulations

- ❑ Routine monitoring to ensure or confirm that new users meet license conditions. Such a random and selective inspections are particularly effective in terms of improving and maintaining compliance levels.

Compliance and Enforcement

Common approaches to Compliance and Enforcement in Spectrum Management should be explored so that the various Regulatory efforts within the Region could be maximized. These approaches include:

❑ Technical standards authorized region-wide by regulatory bodies

❑ Sharing of information with all regulatory authorities regarding compliance by operators in multiple Caribbean territories with standards and regulations

Challenges Cont'd

- Interference issues

- Broadcasting spectrum demand

- Coordination of spectrum use

- Compliance and Enforcement

Challenges Cont'd

- Dealing with cross border interference

- Bi-lateral and Multi-lateral matters

- Sovereignty issues

- Dynamics for Regional vs. National

- Lack of appropriate expertise in Member States

Conclusion

☐ The harmonized Spectrum Management approach created in the ECTEL Member States has sought to ensure the social, economic and sector development imperatives of the region commensurate with the rapid pace of technological innovation.

☐ In carrying out its mandate it has ensured, notwithstanding its challenges, that the telecommunications markets operate effectively to offer the citizens affordable access to the full range of telecommunications services available from wireless technologies.

The End

THANK

YOU

FOR

YOUR

KIND

ATTENTION