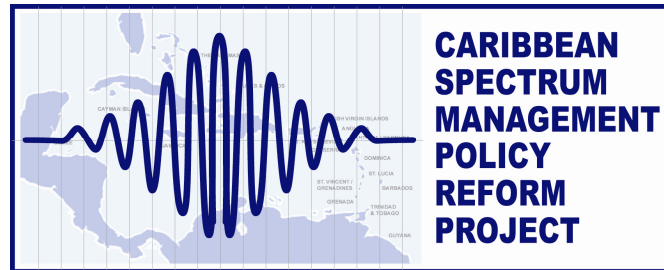




Caribbean Telecommunications Union



Caribbean Spectrum Management Policy Framework

Funded By:



Canadian International
Development Agency

Agence canadienne de
développement international

Prepared By: Caribbean Spectrum Management Task Force

Date: 4th October, 2007

Issue: 1.8

EXECUTIVE SUMMARY

In September 2004, the 7th General Conference of Ministers of the Caribbean Telecommunications Union (CTU) mandated the CTU Secretariat to establish a Caribbean Spectrum Management Task Force to review the spectrum management policies and make recommendations for spectrum use in the region. Following two multi-stakeholder regional spectrum policy seminars which confirmed support for harmonising spectrum management policies in the Caribbean, a functional level Spectrum Management Task Force was appointed in July 2006 along with a Steering Committee of four members drawn from the level of the CTU's Executive Council in order to guide the Task Force's work.

This document incorporates some initial work of the CTU Secretariat with the results of the deliberations of the Caribbean Spectrum Management Task Force. It reviews the technological, regional and international economic and regulatory trends and factors which impact on the use of spectrum as well as the results of an audit of regional spectrum management practices by external experts to justify a thrust towards regional collaboration and harmonisation of policies and operational practices for the economic benefit of the region. It proposes policy objectives and specific policy prescriptions for the creation, maintenance and governance of a region of standardised spectrum usage in the Caribbean. Policy objectives include:

- Reform of existing policies and procedures in licensing, allocation, assignment and pricing of spectrum to reflect the evolution of wireless technologies.
- Fair, efficient, transparent and non-discriminatory processes for accessing spectrum
- Harmonization of policies across the region.
- Establishment of a regional spectrum management advisory body, such as the Spectrum Management Task Force.
- Ensuring that spectrum is available for important public purposes (e.g. law enforcement, public safety, emergency) and recognition of the social, public safety, security, privacy protection and public nuisance issues relating to its use
- Ensuring that spectrum is made available for new technologies and services, and flexibility is preserved to adapt to new market needs.

Among other things, specific recommendations are made for:

- Consistent conformance with the spectrum allocation requirements of ITU Region 2, in which the Caribbean region is located, and development of an indicative Frequency Allocation table, consistent with the ITU Region 2, for use in the Caribbean
- Bi-lateral and multi-lateral initiatives to minimise frequency conflicts with neighbouring Caribbean states which for reasons of political structure do not at present conform to ITU Region 2 requirements
- Common approaches to compliance and enforcement

- regional standards and procedures e.g. in certification of radio amateurs and GMDSS operators, in type approvals and mutual recognition agreements
- adoption of common frequencies for disaster management and emergency communications as well as adoption of relevant international protocols on emergency communications e.g. the Tampere Convention etc.

The final section of this proposal identifies the short term actions which are recommended and are being requested of the CTU's General Conference of Ministers in order to enable effective implementation of the proposals.

Caribbean Spectrum Management Policy Framework

EXECUTIVE SUMMARY	2
1. INTRODUCTION	5
1.1 POLICY FRAMEWORK OVERVIEW	6
2 METHODOLOGY	6
3 RATIONALE FOR A CARIBBEAN SPECTRUM MANAGEMENT POLICY FRAMEWORK.....	7
3.1 TECHNOLOGICAL OVERVIEW.....	7
3.2 INTERNATIONAL CONTEXT.....	7
3.3 REGIONAL CONTEXT	8
3.4 CARIBBEAN CHALLENGES	9
3.5 POLICY FRAMEWORK IMPERATIVES.....	10
4 POLICY FRAMEWORK OBJECTIVES	11
5 PROJECT MONITORING AND EVALUATION	12
6 POLICY COORDINATION AND COMMON STRATEGY	12
7 SPECTRUM PLANNING	13
7.1 FREQUENCY ALLOTMENT AND ASSIGNMENT	14
8 LICENSING OF SPECTRUM	14
9 COMPLIANCE AND ENFORCEMENT	15
10 OPERATIONAL POLICIES AND PROCEDURES	16
11 INTERNATIONAL AND REGIONAL PARTICIPATION	16
12 LEGAL FRAMEWORK	17
13 CAPACITY BUILDING	17
14 CERTIFICATION	18
15 INSTITUTIONAL FRAMEWORK.....	18
17 POLICY FRAMEWORK IMPLEMENTATION ACTIONS	19
APPENDIX 1 - QUESTIONS / ISSUES CONSIDERED FOR DRAFTING THE POLICY FRAMEWORK	21
APPENDIX 2 - INTERNATIONAL AND REGIONAL BODIES.....	23
APPENDIX 3 - CARIBBEAN SPECTRUM MANAGEMENT POLICY FRAMEWORK CONTRIBUTORS	24

CARIBBEAN SPECTRUM MANAGEMENT

Policy Framework

1 Introduction

In September 2004, the 7th General Conference of Ministers of the Caribbean Telecommunications Union (CTU) mandated the CTU Secretariat to establish a Caribbean Spectrum Management Task Force to review the spectrum management policies and make recommendations for spectrum use in the region. In pursuance of this mandate, the Secretariat conceived the Spectrum Management Policy Reform Project encompassing the following activities:

- Face to Face Consultations.
- Training.
- Spectrum Field Audits.
- Data Collection and Analysis.
- The Establishment of a Caribbean Spectrum management Task Force.
- The Development of a Spectrum Policy Framework document.

In October 2005, the CTU organized a multi-stakeholder Caribbean spectrum policy seminar in Trinidad and Tobago to solicit views on the formulation of and the key issues to be addressed by the project. A follow-up Spectrum Management Workshop and Consultation was held from 27th to 29th March, 2006 in Antigua which attracted forty on-site senior officials from government, regulatory agencies, operators and private sector supplier companies. Additionally over 125 persons from 20 countries participated via an interactive web cast of the proceedings. Delegates supported the establishment of a Caribbean Spectrum Management Task Force to develop the Caribbean Spectrum Management Policy Framework Document and to oversee on-going spectrum use in the Caribbean. Additionally they recommended that the data collection and analysis should inform the development of the policy framework.

The Task Force was established in July 2006. A Steering Committee of senior regional policy-makers was also established to provide technical guidance to the work of the Task Force. Data collection and analysis commenced in September 2006 and the first meeting of the Task Force was held from 2nd to 4th October 2006 in St Vincent and the Grenadines. Subsequent meetings have been held in March 2007 in St. Lucia, August 2007 in Curacao and September 2007 in Trinidad along with on-line collaboration. The Steering Committee met in February 2007 in Trinidad and has since provided constructive guidance to the work.

The contents of this document incorporate some initial work of the CTU Secretariat with the results of the deliberations of the Caribbean Spectrum Management Task Force.

1.1 Policy Framework Overview

The General Conference of Ministers unanimously agreed that the member States of the Caribbean Telecommunications Union shall work collaboratively to develop and apply a harmonized policy framework for the management of the radio spectrum to include allocation, assignment and licensing and take into consideration the consumer demands for new services, technological developments, the various stages of telecommunications developments and the particular circumstances in member States.

The **Caribbean Spectrum Management Policy Framework** is intended to facilitate the harmonization of policy approaches to spectrum management in the Caribbean. It is recognized that the framework would need to be revised periodically to take into consideration the evolution of new technologies and services, consumer demands for new services, and regional and international developments. The Caribbean Spectrum Management Policy Framework is expected to promote a regional environment of regulatory certainty which encourages private sector participation and investment and ensures that spectrum is utilized efficiently, economically and rationally in keeping with the rapid evolution of wireless technologies and services. The spectrum should also be utilized within the wider framework of economic diversification and development which maximizes the contribution of spectrum resources to the advancement of the social welfare of the countries and the Region.

2 Methodology

This Policy Framework proposal has been informed by the recommendations submitted by participants of the consultative meetings held in Trinidad and Tobago in October 2005 and then in Antigua and Barbuda in March 2006. These recommendations were further developed by the Caribbean Spectrum Management Task Force which convened its 1st Spectrum Policy Development Meeting in St Vincent and the Grenadines from 2nd to 4th October 2006.

At this meeting the Task Force, supported by expert practitioners in the field, broke into three working groups, each of which was responsible for formulating the policy approach for specific issues relating to spectrum use. The groups' recommendations were subsequently discussed in plenary session and further refined to develop an initial draft policy framework document. Appendix 1 shows a list of questions covering the scope of issues identified for development of the framework.

An on-line spectrum management forum was initiated on 23rd October 2006 and comments were posted by the International Amateur Radio Union. Members of the Task Force were requested to seek comments on the draft document. Based on consultations, feedback and comments were received from Qualcomm, Digicel and Cable and Wireless. Additionally, the Regulatory Authorities of Trinidad and Tobago and St Vincent and the Grenadines provided written comments on the document.

On February 1 to 2, 2007, there was a meeting of the Spectrum Management Steering Committee (SMSC). The objectives included the review of the draft field audit reports and the draft policy framework document. The SMSC provided specific recommendations for the review of the framework document and the future assignments of the Task Force.

The 2nd meeting of the Task Force was held from 7th to 9th March 2007 in St. Lucia. The objectives of the meeting included the refinement of the draft framework document

taking into consideration comments received from the SMSC and all other stakeholders (including QUALCOMM, Digicel, Cable and Wireless and the presenters). Further refinements were completed at further meetings in August 2007 in Curacao, September 2007 in Trinidad and also via on-line collaboration.

3 Rationale for a Caribbean Spectrum Management Policy Framework

3.1 Technological Overview

When wireless telecommunications services were introduced at the turn of the twentieth century, the frequency assignment process was based essentially on mitigating interference and the spectrum was used only by a few operators. At that time, the technology did not have intelligence capabilities to discriminate between different frequencies with precision.

Over the last two decades there have been several technological innovations which produced intelligent wireless devices that not only utilize spectrum more efficiently and are more discriminating in terms of frequency use and rejection, but also facilitate converged services.

In addition to the improved technical capabilities of these devices, they are becoming more compact / miniaturized and affordable to the end user. This trend is one of the key drivers responsible for the proliferation of wireless devices in every aspect of human life.

Consequently, while there have been gains in frequency efficiency and discrimination, there is an ever growing challenge of balancing existing with new and varied spectrum uses.

In most Caribbean countries, the pace of policy development and the attendant legislative and regulatory reform have not kept pace with the rapid evolution in wireless technologies. As a result, the traditional methods for spectrum management have become impractical and inefficient in the context of new technologies and could become a barrier to entry for prospective investors.

3.2 International Context

The telecommunications sector, including radio communications, is organized internationally within the framework of the International Telecommunication Union (ITU), which provides the basic framework for global coordination and management of the radio-frequency spectrum. Member States of the ITU agree to observe the instruments relevant to spectrum management: ITU Constitution, The Convention and the Radio Regulations. In addition the Constitution entrusts ITU's Radio-communication Sector (ITU-R) with the task of ensuring "rational, equitable, efficient and economical use of the radio-frequency spectrum by all radio communication services."

The Radio Regulations constitute the principal regulatory framework within which States undertake to operate radio services and the basic tools for international

spectrum use. They have international treaty status and are periodically reviewed (about every three years) by the World Radiocommunication Conference (WRC)¹, which provides the opportunity for member States to influence the direction of international spectrum policy.

The ITU Radio Regulations, for example, contain the international frequency allocation table ("ITU Allocation Table"). This table is important in that it forms the global framework for regional and national spectrum planning.

One of the key features of the ITU Allocation Table is that it sets out the frequency bands that have been allocated to services and divides the world into three distinctive regions. The Caribbean, along with the Americas, falls within the parameters of Region 2 of the ITU Allocation Table.

3.3 Regional Context

3.3.1 Regional Regulatory Overview

In 1997 many of the Caribbean countries entered into commitments under the World Trade Organisation (WTO) agreement and adopted the Reference Paper guidelines to liberalize their telecommunication markets by dismantling the exclusive agreements entered into with the various incumbent operators.

In 2000, Jamaica became the first English speaking Caribbean country to liberalize the telecommunications sector on a phased basis, starting in March 2000 and ending in March 2003. The Office of Utilities Regulation (OUR), was given the main responsibility for regulating the sector, while the Fair Trading Commission, the Spectrum Management Authority and Broadcasting Commission have responsibility for other regulatory functions which are not handled by the OUR.

The countries of the Organisation of Eastern Caribbean States² (OECS) followed in 2000 by adopting a unique model which established a central advisory regulatory agency, the Eastern Caribbean Telecommunication Authority (ECTEL), for the five constituent nations via the ECTEL Treaty. The Telecommunications Acts were passed in some of these states in 2000 and all the Acts came into effect in 2001, thereby establishing the National Telecommunications Regulatory Commissions in each of the participating territories to handle the regulatory functions.

Barbados opened its market in 2003 with the Government Ministry responsible for Telecommunications and the Fair Trading Commission regulating different aspects of the sector.

In 2005 Trinidad and Tobago opened its market, approximately one year after establishing the Telecommunication Authority of Trinidad and Tobago (TATT) to regulate the market.

¹ WRC 2007 will be held in Geneva from 22 October - 16 November 2007

² Grenada, St Vincent and the Grenadines, St Kitts and Nevis, Dominica and St Lucia

Each of these administrations has independently adopted different approaches, practices and methodologies for regulating the sector. While some commonalities may exist, the development of regulatory policies and functions across the Caribbean reflect the diversities in the different experiences and circumstances in the nations of the region.

While only examples in the English speaking countries have been considered, there are Spanish, Dutch and French speaking countries in close proximity, some independent and others dependent on a Governing body outside of the Caribbean, also with differing approaches to spectrum management.

Whatever the regulatory model followed, the experience has been that in all the territories, cellular mobile telephone market was the first area of telephony competition and the growth in wireless services has been unprecedented, in many cases supplanting wire-line services.

3.3.2 Regional Economic Overview

In 1989 the Caribbean Community³ (CARICOM) Heads of Government took a decision to establish the Caribbean Single Market and Economy (CSME). The CSME which came into force on 1st January 2006 represents a move to deepen the regional integration process and to better respond to the challenges and opportunities presented by globalisation and the increased intensity of trade liberalization.

The ultimate goal of the CSME is to improve the social and economic status of Caribbean citizens. This would be accomplished by enhancing levels of international competitiveness and regional coordination of the economic policies of Member States.

Liberalisation of the services sector, one of the goals of the CSME, would necessitate addressing the heterogeneous nature of the sector, removing barriers/measures to trade in services which exist in the form of regulations, administrative decisions, formal and informal policies and practices which were developed over a period of time and establishing information resources for providing guidance on the status of the CSME.

3.4 Caribbean Challenges

The Caribbean covers an area of approximately 2 million km², with island and continental states, democracies and colonial dependencies; countries ranging in size from 261 km² to 216, 000 km². Populations range from less than 50, 000 to tens of millions and GDP per Capita from US\$1,600 in the poorest nations to US\$16,000 in wealthier nations. English, French, Spanish and Dutch are spoken along with several hundred dialects.

This diversity of the nations in the Caribbean gives rise to a number of constraints and points to some critical needs as regards spectrum management.

³ Members: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago. Associate Members: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands

The following constraints currently exist:

1. Limited financial and human resources for effective national spectrum management.
2. Insufficient experienced persons trained in such areas as international conventions and regulations.
3. Inadequate institutional arrangements to deal with the evolving spectrum issues resulting from the proliferation of wireless technologies.
4. Insufficient information on spectrum management best practices.
5. Lack of central coordination of spectrum management in the Caribbean.
6. The challenges associated with developing economies and markets.
7. Independently evolving regulatory practices.
8. Varied legal and regulatory Frameworks.
9. Lack of coordination and resources to analyze and solve problems of interference between neighbouring countries.
10. Diversity and difficulties in pricing regimes.
11. Dissimilar spectrum allotment and assignment in several bands.

3.5 Policy Framework Imperatives

The following summarises the technological, regulatory and economic issues which necessitate the development of a Caribbean Spectrum Management Policy Framework.

- Current and emerging wireless technologies are more sophisticated and efficient in the use of spectrum resources however current spectrum management policies are limiting the speed of proliferation and access to the benefits of these technologies e.g. new converged services.
- There is a dearth of technical expertise and experienced Spectrum Management practitioners.
- The use of radio frequency spectrum transcends national or regional boundaries. Consequently, there is a need for Caribbean nations to cooperate in the methodologies to be employed in managing spectrum usage.
- The diverse regulatory structures and institutions for spectrum management in the region limit opportunities for regulators in individual countries to benefit from regional cooperation and practical experience as markets are progressively liberalized.
- Existing outmoded spectrum policies and practices are delaying response to the increasing demand for spectrum-based services and devices.

- Existing spectrum management policies and practices could prove to be barriers to the smooth functioning of the CSME as they pose challenges to the cost effective entry of new players into the telecommunications market and obstacles to the timely provision of new services to the market by new and existing service providers.

4 Policy Framework Objectives

The Caribbean Spectrum Management Policy Framework must express the social, economic and sector development imperatives of the region recognizing the rapid pace of technological innovation. It must ensure that Caribbean telecommunications markets operate effectively to offer Caribbean citizens affordable access to the full range of telecommunications services available from wireless technologies. In addition the Framework must address the issues Caribbean nations face in deriving maximum benefit from the explosion in wireless technologies under the CSME.

The Framework proposes at minimum, recommendations for the following:

- Reform of existing policies and procedures in ,allocation, pricing, assignment, and licensing of spectrum to reflect the evolution of wireless technologies.
- A fair, efficient and transparent process for awarding licenses
- Harmonization of policies across the region.
- Promotion of the most efficient, productive use of spectrum across the Caribbean.
- Promotion of non discriminatory access to spectrum.
- Development of an indicative Frequency Allocation table, consistent with the ITU Radio Regulation Frequency Allocation table, for use in the Caribbean.
- Making frequency allocation and assignments based on market demands and other appropriate means
- Incorporation of mechanisms for monitoring and sharing information relating to spectrum use
- Establishment of a regional spectrum management advisory body, such as the Spectrum Management Task Force.
- Ensuring that spectrum is available for important public benefits (i.e. law enforcement, public safety, emergency and other services of national interest).
- Recognition of the social, public safety, security, privacy protection and public nuisance issues relating to wireless technologies.
- Ensuring that spectrum is made available for new technologies and services, and flexibility is preserved to adapt to new market needs
- Promotion of competition

5 Project Monitoring and Evaluation

Periodic monitoring and evaluation of the Spectrum Management Policy Reform Project are recommended against the proposed objectives and targets. The evaluation should include gap analyses to inform the future directions of spectrum management in the region.

6 Policy Coordination and Common Strategy

Through CARICOM, Caribbean countries have embarked on the CSME; a harmonized approach to sustainable economic development. One of the fundamental principles is that ICT is an important driver to economic development. With the liberalization of the ICT sector across the Region, there is increased recognition of the economic value and importance of the radio frequency spectrum. Therefore, as a common policy imperative, the Radio Frequency Spectrum should be managed in an efficient manner to promote economic, social, cultural and technological development for the countries in the Caribbean region.

The policy and strategy for the management of the spectrum should support inter-alia:

- The development of synergies in the area of disaster management within the context of the comprehensive disaster management framework developed by CDERA. The Caribbean countries, being exposed to the frequent occurrence of hurricanes in the region, should consider it as an utmost priority becoming signatories to the Tampere Convention, the Inter-American Convention on International Amateur Radio Permit and promote co-ordination among CDERA, the Amateur Radio Community and other relevant organizations.
- A harmonized approach to spectrum management.
- Technology neutrality.
- Spectrum planning to facilitate roaming and minimize frequency interference. Consideration should be given to a harmonized approach to unlicensed spectrum.
- New and emerging technologies, e.g. broadband wireless systems and services, satellite to home, and digital broadcasting, etc.
- The use of Spectrum Management software/hardware and databases of technical and administrative information on spectrum usage.
- The utilization of the Radio Frequency spectrum for safety and security purposes including maritime, aeronautical and search & rescue services.
- Market-based assignment of spectrum to users, and to uses, that derive higher economic value from the use of the resource. However, consideration should be given to the assignment for public interest goals.

- Mechanisms for responsiveness and flexibility to changes in market demand, innovations in technology and changes in ITU radio regulations, giving due consideration to CITEL recommendations.
- The adoption of common technical standards.
- The development of suitable environmental guidelines and their enforcement in collaboration with all relevant agencies.
- Ensuring ongoing awareness of satellite resources (orbital slots) allocated to Caribbean countries by the ITU and determination of their technical and economic viability.

7 Spectrum Planning

Bearing in mind the sovereign rights of member states and recognising the substantial benefits to be derived from regional coordination of spectrum use planning, it is recommended that the Caribbean adopt a harmonized frequency allocation table for the region to allocate services to the various frequency bands as per the ITU Region 2 guidelines. This is vital for the region to operate as a single trading block.

Spectrum planning as a fundamental activity in spectrum management shall therefore follow the following processes:

- The allocation of the radio frequency spectrum for the Caribbean region's island and continental states shall be based on the allocation table for Region 2 as recommended by the International Telecommunications Union. Notwithstanding the commitment of countries to harmonize frequency plans, countries may exercise flexibility in the applications (usage) as appropriate.
- Recognizing that there are some territories that because of political considerations are governed by Region 1 policies, these countries will have the flexibility to enter into bi-lateral arrangements to the benefit of the Region, while making representation at the international level to achieve harmonization in this area.
- The radio frequency spectrum shall be allocated in accordance with national public policy objectives, while ensuring a balance between the public sector and private sector to the benefit of all the people of the Region. The reallocation of and access to the spectrum should be adapted to meet changing user needs and to facilitate the deployment of new and emerging services.
- Radio spectrum planning shall allow for reserved frequency allocations for law enforcement, public safety, emergency and other services of National interest.
- Spectrum reallocation and spectrum sharing among various services and users shall be based on appropriately defined criteria and conditions in order to fulfil growing demand for spectrum.
- Spectrum planning shall at all times give due regard to spectrum efficiency in policy formulation and spectrum management practices.

- Spectrum planning shall give due regard to the decisions of future international and regional conferences in terms of new allocations of spectrum for various services.

7.1 Frequency Allotment⁴ and Assignment⁵

Frequency allotment and assignment within spectrum bands shall be undertaken in the context of an overall spectrum plan consistent with ITU Region 2 recommendations. Notwithstanding the commitment of countries to harmonize frequency plans, countries can exercise flexibility in the applications (usage) as appropriate. In order to promote efficiency in policy formulation and spectrum management practices, the following principles shall be adopted:

- Radio frequency allotments and assignments *shall* be made in accordance with public policy objectives, while ensuring a balance between the public sector and private sector to the benefit of all the people of the Region.
- Radio frequency allotments and assignments *shall* allow for reserved frequencies for law enforcement, public safety, emergency, future needs and other services of national regional interest.
- The Regulator shall have the authority to re-assign spectrum and authorize spectrum sharing among various services and users based on appropriately defined criteria and conditions in order to fulfil growing demand for spectrum and ensure its efficient usage.

8 Licensing of Spectrum

The different methodologies now in use in the Caribbean should be reviewed to adopt a common approach that reflects the following:

- A consistent approach to the establishment of regional guidelines for the development of operational policies.
- The national spectrum management authority should have the power to assign and re-assign radio frequency spectrum. However, where the spectrum is used for offering public telecommunications and broadcasting services, the Government or the appropriate authority which licenses the spectrum should approve the offering before the spectrum is assigned or re-assigned.

⁴ Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more administrations, for a service in one or more identified countries or geographical areas under specified conditions.

⁵ Assignment: Authorization given by an administration for a radio station to use a given frequency or channel under specified conditions

- An appropriate transparent methodology for licensing should be utilized in order to promote efficient spectrum use,
- The licensing procedures adopted should be efficient in order to facilitate access to the spectrum.
- The standardization of the technical information requested on licence application forms used for engineering analysis and evaluating the various types of licence applications.
- The inclusion of a licence-exempt regime for the use of low-powered mass market radio devices.
- Spectrum pricing principles which:
 - i.) reflect the economic value of the spectrum,
 - ii.) promote policy goals
 - iii.) are derived from a transparent process
 - iv.) take into account the level of spectrum usage
 - v.) foster the provision of services at an affordable price and minimize cost barriers to entry.

9 Compliance and Enforcement

Common approaches to Compliance and Enforcement in Spectrum Management should be adopted so that the various regulatory efforts within the region may be optimized.

These approaches include:

- Effective regulation that mitigates inefficient spectrum usage
- Laws, regulations and the required resources to ensure effective enforcement.
- Comprehensive mechanisms and resources (e.g. monitoring equipment) that facilitate monitoring operator compliance as well as the enforcement of regulations
- A common regional approach to procurement of monitoring equipment which will leverage the benefits of economies of scale.
- Technical standards, RF radiation policy and testing procedures authorized region-wide by regulatory bodies.
- Sharing of information amongst all regulatory authorities regarding the level of compliance with the standards and regulations by operators which offer services in multiple Caribbean territories.

10 Operational Policies and Procedures

Operational policies and procedures are critical for effective Spectrum Management. A common approach to operational activities in spectrum management would engender a better understanding and easier collaboration amongst countries of the Caribbean. In this regard, it is recommended that there is harmonization of operational policies and procedures which are based on international best practices for spectrum management activities including:

- Spectrum planning.
- Licensing of spectrum.
- Spectrum Monitoring, and,
- Compliance and Enforcement.

11 International and Regional Participation

A mutually acceptable framework should be established for effective representation of the Caribbean region's island and continental states and colonial dependencies of varying population sizes, economic situations, linguistic diversity and various political systems.

Bearing in mind the sovereign rights of member states, appropriate mechanisms shall be utilised for consultation, exchange of ideas, collection and dissemination of information among all stakeholders in order to advance best practices in spectrum policy, planning and management, while recognizing the commitment to the community of stakeholders:

- International and Regional bodies⁶.
- Operators.
- Consumers including youth, indigenous population and other disadvantaged groups.
- Regulators
- Policy makers.

⁶ A list of such International and Regional bodies can be found in Appendix 2.

12 Legal Framework

The Caribbean Spectrum Management Policy Framework recognizes that the situation in the Caribbean reflects different levels of authority and decision making by national telecommunications Ministers and/or national regulatory authorities in the various countries. The Policy Framework also recognizes the existence of the various legal frameworks within each country as well as those that are established in line with the regional and international organizations, including the CARICOM Treaty, the CTU, ECTEL Treaty, ITU Constitution and Conventions et al.

Within the legal framework, provisions must be made for legal instruments which clearly define:

1. The regulatory body responsible for spectrum management.
2. The role, functions, powers, rights and obligations of the Regulator.
3. The linkages between the regulatory body and other members of the Governmental structure, including Ministers.
4. Linkages with regional and international organizations.
5. The working methods of the Regulator.

At the regional level, provision should be made for the framework of the SMTF to be so embedded in the CTU in order to achieve its tasks for regional harmonization of spectrum management.

13 Capacity Building

In recognition of the need for building human capacity and expertise in relation to the management of the spectrum, Caribbean countries shall actively engage in the following, utilizing regional resources and institutions where appropriate:

- Training and development to be provided by national and regional institutions with specific focus on the principles and practices of radio spectrum management inclusive of all technical and administrative aspects.
- Information sharing
 - Documentation of best practices and experiences,
 - Development of web-based facilities.
- Examination of available alternatives for training.
- Coordination of existing avenues for training and development.
- Training Needs Assessment/Audit.

13.1 Capital Resources

Recognizing the need for adequate and appropriate spectrum management software and hardware to effectively manage the spectrum, countries shall seek to implement such systems in the most cost-effective manner. This may involve co-ordination in the acquisition of such services where necessary to achieve economies of scale.

13.2 Financial Resources

All member states should appreciate the necessity and make provisions for adequate funding for the development of harmonized spectrum management in the Caribbean Region. In this context, the Caribbean should seek appropriate funding opportunities and sources.

14 Certification

The following is recommended for certification:

- The formulation of a regional approach to the examination and certification of Radio Amateur and GMDSS operators.
- The formulation of a regional approach to the certification of radio-communication equipment via a standard type approval regime and mutual recognition agreements.

15 Institutional Framework

The Caribbean institutional framework for spectrum management must provide the necessary structure for integrating existing spectrum systems, therefore:

- Administrations should seek to ensure that one agency / authority manages the entire radio frequency spectrum.
- The current Spectrum Management Task Force (SMTF) and its constituent bodies should be adopted as a permanent spectrum management harmonization mechanism and be constituted as a virtual regional authority for spectrum management, having a steering committee and administrative and technical support that are embedded in the CTU's operating process under the legal authority of its Council of Ministers and ultimately the CARICOM treaty (cf. the Permanent Consultative Committees of CITEL).
- An appropriate representative from each national authority serving from time to time will constitute the Spectrum Management Steering Committee (SMSC). Administrative and technical personnel will be sourced from the national authorities from time to time, as issues arise.
- The SMSC through the Conference of Ministers will provide advice to all national spectrum management authorities regarding legislative and regulatory policy issues to facilitate regional harmonization in spectrum management.

16 Policy Framework Implementation Actions

The following actions are recommended in order to realize the objectives of the proposed Policy Framework:

0 - 6 Months (short term):

- Adoption of this Spectrum Management Policy Framework proposal by the General Conference of Ministers.
- Authorisation of the Task Force and the Secretariat to formally circulate the Document to Caribbean Governments for consideration and comments with a view to adoption by the Caribbean Governments.
- Establishment of the Task Force as a permanent standing committee within the CTU to continue the study and development of spectrum issues, to review and update the Spectrum Management Policy Framework Document, to research spectrum issues with a view to formulating Caribbean responses to international developments.
- Mandate the Task Force to examine the recommendations of the Field Audit Report to determine modalities of implementation by Regional Spectrum Management Authorities where applicable
- Determination by the Task Force in collaboration with the Secretariat of the appropriate configuration for employing the ITU Spectrum Management Software for Developing Countries and establishment of a Caribbean Centralised Spectrum Management Data Base.
- Specification of appropriate sources of funding for the work of the Task Force
- Mandate the Task Force in collaboration with the Secretariat to facilitate achievement of certain “quick win” specific recommendations herein identified e.g. certification for Amateurs, GMDSS, type approvals, disaster communications etc.

6 - 12 Months (medium term):

- Engagement by the Task Force in collaboration with the Secretariat of Caribbean countries and dependent territories not operating according to ITU Region 2 Spectrum Allocation Table to address the co-ordination issues to minimize cross border interference particularly in the broadcast bands.
- Examination by the Task Force in collaboration with the Secretariat of appropriate allocations of spectrum to new services such as digital broadcasting etc. so as to ensure that going forward the Caribbean Region continues on an harmonized path
- Development of a Spectrum Pricing Policy Framework Document including recommendations for market based approaches to spectrum pricing by the Task Force in collaboration with the Secretariat.

Ongoing

- Authorisation of members of the Task Force from time to time to represent and speak on behalf of the Caribbean at international fora on spectrum management issues.

17 APPENDIX 1 - Questions / Issues Considered for Drafting the Policy Framework

Countries and stakeholders were required to answer the following questions. The responses were discussed by the Spectrum Management Task Force and the comments were used to develop and revise the Spectrum Management Policy Framework document.

- Are there compelling reasons for harmonization of spectrum management procedures and practices in the Caribbean Region?
- Do you agree with the initial recommendations in paragraphs 5 to 15 as suggested at the 1st meeting of the Spectrum Management Task Force? Can you add to these recommendations or suggest changes?
- Do you believe that the suggested institutional structure is an appropriate mechanism for taking the project forward?
- Recognising that this is a continuing work in which areas would you suggest that immediate results can be achieved?
- Having regard to the Caribbean region, in your opinion what frequencies should be allocated to WIMAX, WIFI and unlicensed spectrum?
- Are you satisfied that there is sufficient coordination to facilitate communications in the region to deal with natural disasters? If not what would be your recommendations?
- What new wireless services the region should be anticipating and what frequency plans should be put in place in anticipation of these services? For example should the region reserve any frequencies for new services?
- Does the WRC 07 Agenda have any implications for the Caribbean? If so what suggestions would you make to protect or advance the interest of the region both regionally at CITEL forum and Internationally at the ITU forum?
- Do you believe that a single spectrum data base should be maintained for the Caribbean region?
- Should a Caribbean Allocation Table be put in place?
- In your experience are there any immediate interference issues that should be addressed in the region?
- Does the Caribbean concern itself at this time with the prospects of Digital Broadcasting issues and digital television? If so how in what time should this issue be addressed?
- How should the Caribbean address the environmental issues associated with the proliferation of wireless technologies?
- What approaches should be adopted for the disposal of cellular handsets, batteries and other hazardous waste associated with the wireless technologies?

- Should the Caribbean give consideration to a Regional Satellite Service? If so what are the required steps?
- Should a Glossary of standard terms be developed?
- Do you have any suggestions for the inclusion of other areas and issues in the proposed Regional Policy Framework Document?

18 APPENDIX 2 – International and Regional Bodies

International Bodies:

ITU - International Telecommunication Union

CTO - Commonwealth Telecommunication Organization

Regional Bodies

CANTO - Caribbean Association of National Telecommunications Organizations

CITEL - Inter-America Telecommunications Commission

CARICOM - Caribbean Community

ECTEL - Eastern Caribbean Telecommunication Authority

OOCUR - Organization of Caribbean Utility Regulators

CBU - Caribbean Broadcasting Union

CEDERA - Caribbean Disaster and Emergency Response Agency

19 APPENDIX 3 – Caribbean Spectrum Management Policy Framework Contributors

19.1 CTU SECRETARIAT

Bernadette Lewis	Secretary General
Selby Wilson	Telecommunications Strategist

19.2 SPECTRUM MANAGEMENT STEERING COMMITTEE

Ernest W. Smith	Jamaica, Chairman
Chelston Bourne	Barbados
Sylvester Cadette	Dominica, Vice-Chairman
Wilfredo Lopez Rodrigues	Cuba

19.3 SPECTRUM MANAGEMENT TASK FORCE

Apollo Knights	St Vincent and the Grenadines	director@ntrc.vc
Clement Samuel	Antigua and Barbuda	clement.samuel@antigua.gov.ag
Karlene Francis (Chair)	Jamaica	kfrancis@mct.gov.jm
Kirk Sookram	Trinidad & Tobago	ksookram@tatt.org.tt
Michele Thomas	Jamaica	mthomas@sma.gov.jm
Moises Cortes Escobar	Cuba	moises@mic.cu
Nigel Cassimire	Trinidad & Tobago	nigel.cassimire@ctu.int
Noel Donawa	Trinidad & Tobago	9y4ned@tstt.net.tt
Rawlins Rambaran	Trinidad & Tobago	rambaran@ttol.co.tt
Roy Humes (Vice Chair)	St. Lucia	rhumes@ectel.int
Valmikki Singh	Guyana	md@nfm.gov.gy

19.4 PARTICIPATING STAKEHOLDERS

Delreo Newman	Antigua and Barbuda
Delroy Brown	Jamaica
Denfield Roberts	Cable and Wireless
Denzil West	Montserrat
Fritz Smith	Anguilla

Graciela Piedras	CITEL
Gregory Nelson	British Virgin Islands
Joses Jean-Baptiste	Haiti
Kieron Swift	Trinidad and Tobago
L. Spencer Thomas	Grenada
Lee Madison	Cayman Islands
Leonard Adderley	Bahamas
Lisamae Gordon	Jamaica
Marcella Ost	USA
Michael Davis	Bahamas Telecommunications Company
Perry Mason	St. Lucia
Phillip Cross	ITU
Reginald Bourne	Barbados
Robert Finlay	Grenada
Robert Jarrin	United States of America
Roberto Young	Belize
Shernon Osepa	Curacao
Sola Hines	Jamaica
Sylvester Cadette	Dominica
Sylvester Vital	Dominica
Thea Smith	Suriname
Victor Archangel	Curacao
William Henry	Antigua and Barbuda
Yves Ephraim	Antigua and Barbuda
Peter Mitchell	Trinidad and Tobago
Courtney Jackson	Jamaica
Cris Seecheran	Trinidad and Tobago

Jettie Olf	Suriname
Clement Samuel	Antigua
Joses Jean-Baptiste	Haiti
Michele Thomas	Jamaica
Moises Cortes Escobar	Cuba
Renell Alamilla	Belize

19.5 GUEST SPEAKERS

Ernest King	Congress WBN, Trinidad and Tobago
Marlon Jameson	Congress WBN, Trinidad and Tobago
Winston Hay	Former Executive Director, OUR, Jamaica

19.6 INDUSTRY SPEAKERS

Graciela Piedras	CITEL
Robin Burton	Allan Dick Corporation
Carlos Killian	IA450 Director, Latin America and the Caribbean
Dr John Prince	Executive Director, TATT
Joslyn Read	NewSkies
Jonas Eneberg	Immarsat
Carmelo Rivera	US Department of Commerce
Bob Aamoth	Attorney at Law, Washington DC

19.7 FACILITATORS

Adrian Foster	Attorney at Law, McClean Foster and Co.
Robert Jones	Radio Communication Consultant
Prof. Martin Cave	Spectrum Researcher and Consultant
Mark Connolly	Spectrocan
Phillip Cross	ITU Caribbean Representative
Fergie Legge	Aerosystems
Juan Suarez	Spectrocan
Bjorn Wellenius	Former World Bank Telecommunications Advisor

Dirk-Oliver von der Emden Legal and Economic Affairs, Frequency Management, Swiss
Regulatory Authority

19.8 FIELD AUDITORS

Maurice Drew Radio Regulatory Consultant, Spectrocan, Canada

Hubert Pambrun Radio Regulatory Consultant, Spectrocan, Canada