



FINAL  
REPORT  
OF THE  
FIFTY-SEVENTH MEETING  
OF THE  
CARIBBEAN  
METEOROLOGICAL  
COUNCIL



**CHAIRPERSON:**

**Honourable** Sir Robin Yearwood, Minister of Public Utilities, Civil Aviation and Transportation of **ANTIGUA AND BARBUDA**

**VENUE AND DATE:**

Jolly Beach Resort and Spa,  
Bolans Village  
**ANTIGUA AND BARBUDA**  
16-17 NOVEMBER 2017



## 1. OPENING OF THE SESSION AND ELECTION OF CHAIRPERSON

1.1 At the kind invitation of the Government of Antigua and Barbuda, the Fifty-seventh Session of the Caribbean Meteorological Council was held at the Jolly Beach Resort and Spa at Bolans Village in Antigua on 16-17 November 2017. The Caribbean Meteorological Council is the Governing and policy-making body of the Caribbean Meteorological Organization (CMO).

1.2 **Mr Orvin Paige** of the Meteorological Service of Antigua and Barbuda, commenced the Opening Session of the Meeting by extending words of welcome, after the National Anthem and a prayer by **Archdeacon Franklin Reid**. **Mr Keithley Meade**, Director of the Antigua and Barbuda Meteorological Service, also made some opening remarks, which were followed by a musical rendition by a local guest artist, **Kaiso Joe**.

1.3 **Mr Tyrone Sutherland**, Coordinating Director of the CMO, delivered remarks that focussed primarily on the catastrophic impacts of the 2017 hurricane season on some CMO Member States, particularly in the Eastern Caribbean. He pointed out that the trail of utter destruction and death caused by two category 5 hurricanes had not been seen in decades, such that the economies of the affected islands had been set back by a long way and many citizens had to rebuild their lives. He suggested that, taking into account predicted future regional changes in climate that could lead to more events of this magnitude, governments and the people should rebuild to higher standards that would vastly improve the ability to withstand such storms in the future.

1.4 The feature address was delivered by **Honourable Sir Robin Yearwood**, Minister of Public Utilities, Civil Aviation and Transportation of Antigua and Barbuda. Sir Robin first recognized the many dignitaries in the audience, including **Sir Claire Roberts**, Deputy to the Governor General of the nation. Sir Robin paid particular attention to the impacts of a particularly brutal hurricane season on the Caribbean, in which a number of CMO Member States had been affected in some way by major hurricanes and storms. He noted that, in addition to being the seventh most active season since records began in 1851, in particular with the highest number of major hurricanes since 2005, it was the costliest hurricane season on record with a preliminary estimated total of 316 billion US dollars in damages across the region. He referred to the spirit of friendship, camaraderie and kindness that was demonstrated among the people of the region in the wake of these disasters in 2017.

1.5 He recognized that the region had been facing a number of weather and climate-related challenges, from the impacts of severe droughts on water sources and food security, to the destruction emanating from floods and landslides in vulnerable communities. He expressed the view that these challenges would test the resolve of the region and called on governments, regional institutions and the people to find new and innovative ways to effectively combat the weather and climate challenges that threaten us.

1.6 After the feature address, **Mr Edson Joseph**, Permanent Secretary in the Ministry of Public Utilities, Civil Aviation and Transportation of Antigua and Barbuda delivered the closing remarks to the session.

1.7 The Meeting elected Honourable Sir Robin Yearwood as the Chair of the Caribbean Meteorological Council for its 57<sup>th</sup> session and the intercessional period until the next annual meeting of the Council.

## 2. ADOPTION OF AGENDA AND PROCEDURAL MATTERS

2.1 The Agenda adopted by the Meeting is shown in **ANNEX I** of this Report. The Meeting fixed its hours of work and determined the order in which it would conduct its business. The list of Delegates attending the Meeting is attached as **ANNEX II** to this Report.

## 3. CMO EXECUTIVE REPORTS

### 3(a) Coordinating Director's Report

3.1 The CMO Coordinating Director presented his report on the activities and issues concerning the CMO Headquarters Unit since the previous session of the Council. The Council first engaged in a lively review of the major impacts of weather in the region during the hurricane season of 2017; which turned out to be the most active since 2005 in the Atlantic/Caribbean basin and the 7<sup>th</sup> most active on record behind 1933, 2005, 1893, 1926, 1995, and 2004. In particular, the Council looked at the major destruction and loss of life caused by **category 5 Hurricanes Irma** and **Maria** to Member States in the Eastern and Northern Caribbean. Council expressed its sympathy to the people of Antigua and Barbuda, Anguilla, the British Virgin Islands, the Turks and Caicos Islands and particularly to Dominica, along with the French-Dutch island of Saint Martin/Sint Maarten, for their damage and loss as a result of these systems. .

3.2 In this discussion, Council noted that in addition to these major hurricanes, there were several other impacts on the Caribbean, such as **Tropical Storm Bret** that crossed Trinidad in June – its first such system that far south since 1974. By the end of August, there were already nine (9) tropical storms and hurricanes, including **Tropical Storm Franklin** that skirted just to the north of Belize, **Harvey** that drenched Barbados and the Windward Islands as a *tropical storm*, before impacting the US State of Texas and others as a *major Hurricane*. Council also discussed the number of heavy rainfall episodes that had significant economic and social impacts in the many parts of the region in 2017.

3.3 It was particularly important to note that the occurrence of the two category 5 hurricanes in the Eastern Caribbean, and in quick succession, was not normal and actually quite unprecedented. Council took particular note that the warnings issued by the main forecast offices in the region, along with the local alerts by the individual National Meteorological Services, were most timely and appropriate for all these tropical storms and hurricanes, as well as other severe weather events that affected the Caribbean, such as major widespread floods in October in Trinidad.

3.4 With such extensive destruction in so many of CMO Member States, Council was not surprised that the Meteorological Services in the affected islands suffered extensive damage to equipment. Council noted the emergency assistance provided by CIMH and others and also noted the information provided by the CMO Headquarters that the World Meteorological Organization (WMO) also operates an emergency fund for situations such as these.

3.5 Council noted that, while hurricane-related activities were dominant in 2017, many of the activities of the CMO Headquarters were aimed at regional implementation of many global programmes and initiatives, particularly those set in motion by the World Meteorological Organization (WMO) as they relate to the Caribbean region in general and CMO Member States in particular. Council recognized that, as one of the pillars of its mandate, the Caribbean Meteorological Organization must actively participate in WMO activities at the highest possible level in order to ensure that the interests of small developing states are represented and to guide and advise the CMO Member States in their own related activities.

3.6 For this reason, Council recognized the role undertaken by the Coordinating Director, as an elected member of the WMO Executive Council since 1999, in maintaining a strong and experienced team of senior Advisors and Experts that individually and collectively had become very involved in WMO's programmes and activities, including the participation of relevant regional experts in the technical work of the WMO for the benefit of the entire CMO Membership.

3.7 Council was briefed on the ongoing collaboration between the CMO Headquarters and the Caribbean Community Secretariat on aspects of the "*CMO Operational Programme 2016-2019*" and its link to the implementation of the *Caribbean Community Strategic Implementation Plan 2015-2019*. Within that Implementation Plan was the *Community Operational Plan (COP) 2017–2018*, which comprised the consolidated body of work undertaken by the Secretariat and Regional Institutions, supported by the actions of Member States. Also linked to the Community Plan was the development of the CARICOM Results-Based Management (RBM) System.

3.8 Council also recalled its discussion on the possible establishment of a *Caribbean Community Administrative Tribunal (CCAT)*, which was intended to involve as many regional institutions as possible. The CMO Headquarters informed the Council that during 2017, the Caribbean Court of Justice (CCJ) and the Caribbean Community Secretariat, which were leading the efforts in this regard, had concluded that there were still many technical issues to be resolved by a number of regional institutions before the CCAT could become a reality; thus the CCAT process was not concluded in 2017. Council was informed that the CMO Headquarters and the CIMH would continue to be involved in relevant discussions with the CCJ and CCS in this regard.

3.9 On a staff-related matter, the Council was presented with a proposal to make a second amendment to the CMO Headquarters ***Staff Terminal Benefit Fund***, which the Headquarters Unit operated in lieu of a staff pension fund, because of the small size of the staff complement. Council considered the reasons given for the proposal, as well as the legal opinions contained therein.

### 3.10 **The Council:**

**Noted** the activities and issues concerning the CMO Headquarters in 2017, particularly those dealing with the implementation of major WMO-related activities, and issues concerning the wider Caribbean Community;

**Discussed** the weather-related impacts on the region in 2017, which featured the catastrophic passage of two **category 5 Hurricanes *Irma* and *Maria*** to Member States in the Eastern Caribbean and the Turks and Caicos Islands;

**Approved** a second amendment to the Deed of the CMO Headquarters Staff Terminal Benefit Fund Plan, as shown in **ANNEX III**.

### 3(b) **CIMH Principal's Report**

3.11 The Principal of the Caribbean Institute for Meteorology and Hydrology (CIMH) presented his report to the Council on the activities of the CIMH since its last session in 2016. Council was informed that the CIMH had steadily provided benefits to the Member States for the past eleven years. The CIMH had supported the Region in the area of disaster management, including support prior to, during and after the impacts of Hurricanes *Irma* and *Maria*.

3.12 The Principal indicated that it was widely believed that the Institute was good for the Caribbean and that Member States were better off with, rather than without, the Institute. At a time that Governments in the Region were talking about value proposition for their investments, the CIMH's increasing importance to the Region was highlighted as a positive return on the investment for the Governments.

3.13 The Council was informed that the Government of Barbados was very accommodating to the CIMH as they worked to complete a *Host Country Agreement*. As the CIMH celebrated its fiftieth anniversary this year – 2017, Council was of the strong view that the stature of the Institute had grown during that period both regionally and internationally. Council was informed that *Dr. Colin Depradine*, the longest serving Principal of the Institute, died in 2017 and that his family had agreed to the renaming of the Main building to the “**Depradine Wing**” in his honour.

3.14 The Council was informed of discussions undertaken by the CIMH about new ways of attracting investments, in which one such possibility was through the Caribbean Development Bank (CDB) Strategic Framework (2015-2019). Two areas were identified in which the CIMH and others could attract investment through the promotion of environmental sustainability, noting that within environmental sustainability, there was a climate component and a disaster risk component which could be leveraged. Council noted that CIMH was able to receive funding from the CDB through the alignment of its work programme with the CDB’s strategy.

3.15 Council noted the Institute's growing international activities, including South-South partnerships with the South Pacific and joint scientific research activities with European institutions, such as the Max Planck Institute and its EUREC<sup>4A</sup>, which was a French-German initiative with operations based out of Barbados in support of the *World Climate Research Programme*. The visibility of the CIMH was highlighted, since it was the second year in a row that a CIMH-facilitated project and a co-authored paper were featured on the front cover of the Bulletin of the American Meteorological Society (AMS).

3.16 The Principal briefed the Council on the process that led to the CIMH being designated as a WMO Regional Climate Centre (RCC). He pointed out that the CIMH was the first designated RCC in the North America, Central America and the Caribbean region and the first RCC hosted by a Small Island Developing State (SIDS). The Council noted that the WMO RCC for the Caribbean continued to be viewed as good investment by the international community, while the *Green Climate Fund* expressed an interest to establish a “Climate Innovation Hub” at CIMH, based on the innovation and creativity present in the RCC programme. Council was also informed that the ACP-EU had expressed interest in providing monetary assistance to support climate services development and delivery in the Caribbean. There were also other funding agencies which were interested in or were providing funds to support climate services.

3.17 The **Representative of Grenada** commended the Principal on the achievement of the CIMH and recommended that avenues be explored so that there may be electronic teleconferences with a greater frequency between meetings of the Caribbean Meteorological Council.

3.18 **The Council:**

**Noted** the Principal’s Report and **commended** the Principal for the excellent role that the CIMH continued to play in contributing towards the Region’s development.

**3(c) CIMH Board of Governors’ Report**

3.19 The Chairman of the CIMH Board of Governors presented to the Council, the following decisions that were made at the 54<sup>th</sup> meeting of the Board, which took place on 13-14 November 2017:

1. With reference to Doc 4.7 Staffing Matters: The Board **agreed** to create a new position of Social Scientist at the level of Assistant Lecturer. It was further **agreed** that the remuneration for the post will be met from the funds allocated for the vacant post of Agro-meteorologist.

2. With reference to Doc 4.7 Staffing Matters: The Board **agreed** that the incumbents Mr Shawn Boyce and Ms Kathy-Ann Caesar, acting holders of the position of Chief Hydrologist and Chief Meteorologist respectively, would be appointed to the relevant posts effective 1 December 2017.

### 3.20 The Council:

**Noted** the decisions emanating from the BOG-LIV.

## 4. STATUS OF ACTIONS FROM THE PREVIOUS SESSION

4.1 Following every session of the Council, the CMO Headquarters produced a single document containing an **Action Sheet** that would allow the Council to follow-up on the actions taken on the decisions of its previous session, and to discuss any further actions if required. A summary of the decisions of CMC56 (Grenada, 2016) was presented to Council, giving the status of actions taken to implement these decisions of Council, and indicating areas where action as proposed had not materialized.

4.2 Under CMC56 Agenda Item 6, Special CMO and WMO Issues, (f) Aeronautical Meteorological Services, the Council was informed of the continuing urgent need for Member States to review and complete any outstanding procedures with regards to implementation of the *Quality Management System* (QMS) that had been mandated by the *International Civil Aviation Organization* (ICAO).

4.3 Council was reminded of the discussions, under CMC56 Agenda Item 8 - CMO Budget Estimates for 2017, on the CMO Headquarters' proposal to produce a draft revision of the formula used to determine the level of contributions by Member States to the budgets of the organs of the CMO. This was proposed because of economic and other changes in the region since the last revision in 2002. Council had delayed an earlier attempt to carry out this exercise because there had been an expression of interest by a regional State in joining the CMO. The resulting proposal for a review of the Contribution Formula is shown under Agenda item 7 of this Report.

4.4 Under CMC56 Agenda Item 11 - CMO Weather Radar Network, Council was informed that the use of weather radars by entities other than the Meteorological Services and by the public is well known around the world. Council had been advocating for the wide publicity of regional radars and related composites on websites and by the media, as well as a formal long-term commitment to the operations of the regional radar composite. Significant work was still required in this regard. The formation of a CMO *Operational Radar Working Group* was still to be undertaken by the CMO Headquarters. This had been delayed in 2017 because two of the radars had been out of service for significant periods. These remain items of importance.

## 5. SPECIAL CMO AND WMO ISSUES

5.1 The Coordinating Director briefed the Council on the following special CMO and WMO-related issues in connection with the following topics:

- (a) Outcome/Highlights of the 2017 Executive Council (EC) of the World Meteorological Organization
- (b) WMO Integrated Global Observing System (WIGOS) – Pre-Operational Phase
- (c) Reception of new Geostationary Satellite Imagery in CMO Member States
- (d) The Global Framework for Climate Services (GFCS)
- (e) Issues emerging from the 16<sup>th</sup> session of WMO Commission for Basic Systems

- (f) Aeronautical Meteorological Services – Priority Activities
  - (i) Progress in the Implementation of Quality Management Systems (QMS)
  - (ii) Staff Competency Standards and Training
- (g) Tropical Cyclone Programme and Regional Severe Weather Forecasts and Warning Systems
- (h) The 2017 session of the WMO Regional Association IV.

**(a) Outcome/Highlights of the 2017 Executive Council (EC) of the World Meteorological Organization**

5.2 The 69<sup>th</sup> session of the WMO Executive Council was held at the Headquarters of the World Meteorological Organization in Geneva from 10 to 17 May 2017. The Coordinating Director of the CMO was a member of the WMO Executive Council, having been first elected in 1999 and then serving as the Second Vice-President of the WMO for the maximum two terms between 2003 and 2011. The Coordinating Director was accompanied to this session by a team of advisers and experts, comprising *Dr. David Farrell*, Principal of the CIMH, *Mr Glendell De Souza*, Science and Technology Officer at the CMO Headquarters and *Mr Keithley Meade*, Director of the Meteorological Service of Antigua and Barbuda.

5.3 This 2017 session of the Executive Council continued the implementation process for the programmes set out by the WMO Congress in 2015, particularly the seven priorities for the period 2016-2019. Of particular relevance to the CMO Member States were:

- (i) WMO's **Disaster Risk Reduction** (DRR) programmes and activities to improve the accuracy and effectiveness of impact-based forecasts and multi-hazard early warnings of high-impact hazards;
- (ii) Enhancing the implementation of the **Global Framework for Climate Services**(GFCS), particularly for countries that lack adequate climate services;
- (iii) Promoting the full and mandatory implementation of the **WMO Integrated Global Observing System** (WIGOS) and the **WMO Information System** (WIS) in order to strengthen the global observing systems;
- (iv) Improving operational meteorological and hydrological monitoring, prediction and services in **Polar and High Mountain Regions** ("Third Pole");
- (v) Measures to improve the ability of National Meteorological Services to provide sustainable high-quality **Aviation Meteorological Services**;
- (vi) **Capacity Development** for developing and least developed countries aimed at the delivery of improved weather, water and climate predictions;
- (vii) Improving the **Governance of WMO** based on a strategic review of WMO structures, operating arrangements and budgeting practices.

5.4 The WMO Executive Council made several decisions that affect CMO Member States on the seven priorities above and other related matters, with greater details provided on some of these in the sections below. The Executive Council also held a special dialogue with senior representatives of the aviation sector. Aviation, one of the most weather-sensitive of all economic sectors, was changing rapidly. With air traffic doubling every 15 years, competition increasing and air safety more important than ever, the demand for an expanded array of national and regional weather services had been steadily rising. Thus, with major changes taking place in the aviation sector, Meteorological Services globally and regionally must monitor and adapt to the sector's requirements.

**(b) WMO Integrated Global Observing System – Pre-Operational Phase (2016-2019)**

5.5 The Caribbean Meteorological Council recalled its substantial discussions on the *WMO Integrated Global Observing System* (WIGOS), which is an all-encompassing approach to the improvement and evolution of WMO's global observing systems, and which were needed in all countries to consolidate progress in meteorological and climate research, numerical modelling, and computer and communication technologies. Closely tied to WIGOS is the implementation of the new *WMO Information System* (WIS). WIGOS, together with WIS, form the basis for the provision of accurate, reliable and timely weather, climate, water and related environmental observations and products by all Members and WMO Programmes, which would lead to improved service delivery. Council noted that both WIGOS and WIS were very essential to all technical and scientific activities of Meteorological Services in the Caribbean and worldwide.

5.6 In this regard, the Caribbean Meteorological Council was reminded that WIGOS moved into its Pre-operational Phase in 2016. This Phase was scheduled to end in 2019, with WIGOS to become fully operational from 2020. Council discussed the fact that it was imperative for the Meteorological and Hydrometeorological Services in CMO Member States to develop links and partnerships with other entities that also operated various observing systems at the national level, with the goal of including all related data into the national platforms as part of WIGOS. Council reiterated the goal that CMO Member States and their partners should benefit from a fully operational WIGOS from 2020.

**(c) Reception of new Geostationary Satellite Imagery in CMO Member States**

5.7 Council engaged in a discussion on the new *Geostationary Operational Environmental Satellite - R Series (GOES-R)*, which had been successfully launched from Cape Canaveral in Florida on 19 November 2016. This GOES-R, renamed GOES-16 after launch, was the first of a new generation of geosynchronous environmental satellites that provide atmospheric and surface measurements of the Earth's Western Hemisphere for weather forecasting, severe storm tracking, space weather monitoring and meteorological research.

5.8 Council was informed that between 30 November and 11 December 2017, GOES-16 would be repositioned to its final operational location of 75.2 degrees West, which was the GOES-East location that included the Caribbean footprint. Council discussed the massive technological advances in geostationary observations from this new series of satellites, which would provide National Meteorological Services with unprecedented new capabilities. In this regard, Council noted that personnel from the CMO Headquarters and the CIMH had been directly involved with the US National Weather Service in preparing for the operational use of GOES-16 among CMO Member States. Council urged those Member States that had not made their choice of systems to access the GOES-16 data and imagery to complete the process with urgency before the end of transmission of the outgoing satellite.

**(d) The Global Framework for Climate Services (GFCS)**

5.9 The Caribbean Meteorological Council recalled the discussions on the implementation of the ***Global Framework for Climate Services*** (GFCS), which was a UN-led initiative spearheaded by WMO, to guide the development and application of science-based climate information and services in support of decision-making. The governing structure for the GFCS is an *Intergovernmental Board on Climate Services* (IBCS), which is accountable to the WMO Congress. The Management Committee of the IBCS is determined by the various WMO Regional Associations. Membership for North America, Central America and the Caribbean (WMO Region IV) is through the British Caribbean Territories (BCT), Canada, Costa Rica and the USA. *Dr. David Farrell* was the BCT/CMO representative on the Management Committee with *Mr Adrian Trotman* as the alternate.

5.10 The priority areas for the GFCS were (i) Agriculture and food security (ii) Disaster risk reduction, (iii) Energy (iv) Health and (v) Water. It had been found that a number of countries, particularly developing ones and Small Island Developing States (SIDS), did not provide adequate climate services. Therefore, the GFCS was being implemented through eight global projects, many with an emphasis on developing countries and Small Island Developing States. Several of the GFCS Projects involved or would involve the CIMH. For example, the "*Programme for Implementing the Global Framework for Climate Services (GFCS) at Regional and National Scales*" was funded by a grant from Canada to implement GFCS in the Pacific, the Caribbean, South Asia and the Arctic. This would be achieved by providing improved climate information, predictions, products and services to support climate risk management and adaptation strategies, decision making and actions at national and regional levels.

5.11 In this regard, Council discussed the special role for the *Caribbean Institute for Meteorology and Hydrology* in the implementation of the GFCS, which is discussed in section **5(e)** below. A mechanism had also been created to guide WMO contributions to the GFCS in line with a country-focused, results-based framework. As part of this mechanism, a checklist for the implementation of climate services had been developed in mid-2017 to provide step-by-step guidance to CMO Member States on the implementation of climate services and to assist in identifying areas where support was needed.

#### **(e) Important issues for the 16<sup>th</sup> session of WMO Commission for Basic Systems (CBS 16)**

5.12 Council was reminded that the WMO **Commission for Basic Systems** (CBS) was the WMO Commission with a leading role in overseeing the global development, implementation and operation of integrated systems for observing, data processing, data communication and data management. The sixteenth session of the Commission was held in Guangzhou, China from 23-29 November 2016. CMO Member States that participated in CBS were Trinidad and Tobago (*Mr Marlon Noel*) and the British Caribbean Territories/CMO (*Dr. David Farrell* and *Mr Adrian Trotman* of the CIMH and the CMO Coordinating Director).

5.13 CBS, through the WMO *Global Data Processing and Forecasting System* (GDPFS), strongly supports the implementation of the *Global Framework for Climate Services* (GFCS)(section 5(d) above). An integral component of the GDPFS, in this regard, was a network of WMO-designated **Regional Climate Centres** (RCCs). The WMO RCCs are *Centres of Excellence* that create regional products, including long-range climate forecasts that support regional and national activities and thereby strengthen capacity of WMO Members in a given region to deliver the best climate services to national users.

5.14 The Caribbean Meteorological Council recalled that CIMH had been functioning as a *WMO Regional Climate Centre "in demonstration phase"* for the Caribbean since 2013. Once the CIMH and the CMO Headquarters were satisfied that the Caribbean RCC in Barbados was ready for full operational designation, a formal application to WMO was made by the CMO Headquarters. After a series of reviews by the WMO *Commission on Climatology* (CCI), CIMH had to undertake a detailed technical demonstration of its capabilities to the full CBS-16 session in China. Following a very successful demonstration, CBS-16 recommended to the WMO Executive Council, the formal recognition of the CIMH as a WMO RCC. This process was later completed and formalized at the 69<sup>th</sup> session of the Executive Council and therefore, **effective May 2017**, the CIMH became the *WMO Regional Climate Centre (RCC) for the Caribbean* – the first such designation in the North America, Central America and the Caribbean region.

## **5(f) Aeronautical Meteorological Services – Priority Activities**

5.15 The Caribbean Meteorological Council recalled that, for several years, it had examined the vital issue of Meteorological Services for the aviation sector. Aeronautical meteorology has always been vital for the efficiency, safety and environmental sustainability of civil aviation, and a major or even prime focus for many National Meteorological and Hydrometeorological Services around the world, including the Caribbean. A fundamental factor in the provision of meteorological services to the aeronautical sector has been the implementation of a **Quality Management System (QMS)** for all types of service to civil aviation, imposed by the *International Civil Aviation Organization (ICAO)*, in collaboration with the *World Meteorological Organization (WMO)*. Closely tied to a QMS for aeronautical meteorological services was the requirement for **Staff Competency Standards and Training**.

5.16 The National Meteorological Services in most CMO Member States had been making some progress towards implementation of a QMS for aeronautical meteorology, but the overall pace of progress was still somewhat difficult to fully ascertain. During 2016 and into 2017, a number of Meteorological Services reported to WMO on their compliance with staff competency standards and training for their Aeronautical Meteorological Observers (AMO) and Aeronautical Meteorological Forecasters (AMF). Those that had not yet done so were again urged to inform WMO as soon as possible on the status of their implementation of the competency and qualification requirements, noting that the entry into force of the WMO standard on required qualifications for the Forecasters (AMF) was 1 December 2016. In addition, Council was reminded that ICAO was preparing an amendment to its publication "*Annex 3- Meteorological Service for International Air Navigation*" which, among other things, would call for a "*Demonstration of compliance of the quality system*" by National Meteorological Services. This amendment was expected to come into effect from November 2018.

5.17 The issue of QMS for aviation services led to a significant discussion by Council on the roles between the Meteorological Service as a Service Provider and the roles of the National Meteorological Authority and the service regulator. The Council recognized that there was some confusion over these roles that needed urgent clarification. Of particular significance was the situation with the Meteorological Services within the Organization of Eastern Caribbean States (OECS), in which the identification of the National Meteorological Authority and service regulator was unclear. Council urged the CMO Headquarters to raise this matter with the appropriate regional authorities and ICAO with the aim of achieving clarity on the various entities.

## **5(g) Tropical Cyclone Programme and Regional Severe Weather Forecasts and Warning Systems**

5.18 At every annual session, the Caribbean Meteorological Council reviews the activities within the WMO *Tropical Cyclone Programme (TCP)*, since the TCP remains among the most important to the Caribbean and other tropical basins. The TCP was essential to help reduce the disaster risk associated with tropical cyclones. Council noted that the main regional activity under the TCP was the WMO *Hurricane Committee*, serving the *North Atlantic and Caribbean Basin*. The Hurricane Committee had at its core, the *US National Hurricane Center*, which was one of WMO's primary *Regional Specialized Meteorological Centres (RSMCs)* for tropical cyclones. Council recognized that the regional warning system for tropical cyclones under the WMO TCP was a very efficient system built on maximum collaboration between all Meteorological Services of the region, irrespective of language.

5.19 It had been recognized that there would always be areas that could be improved in any warning system. This was particularly true when one considered that many episodes of severe weather and thus potential natural disasters were not always the result of a tropical cyclone. Council recalled that in November 2015, it had endorsed a proposal being pursued by CMO and partners, to implement a WMO **Severe Weather Forecasting Demonstration Project** (SWFDP) in parts of the Caribbean, with an aim, among others, to foster greater collaboration among National Meteorological Services and Disaster Management Agencies.

5.20 Council was reminded that:

- (i) The SWFDP would cover all the islands from Trinidad in the South to Puerto Rico in the North, with special arrangements for Haiti;
- (ii) The Météo-France Centre in Martinique will serve as the *Regional Forecast Support Facility* for the Project;
- (iii) The Caribbean Institute for Meteorology and Hydrology (CIMH) which, among other functions, is a WMO Training Centre, a WMO Centre of Excellence for Satellite Meteorology and a WMO Regional Climate Centre, would provide technical support for the SWFDP.

5.21 Council was briefed on actions taken by WMO and regional partners, particularly the CMO Headquarters that had been leading the efforts with WMO. It noted that Meetings of the *Expert Group on the SWFDP* took place in Martinique in November 2016 and in Florida in May 2017. Council noted that the Expert Group included Mr Keithley Meade of Antigua and Barbuda, Ms Kathy-Ann Caesar of the CIMH and the Coordinating Director of the CMO (Co-chair), and that the Expert Group would bring in various personnel from the relevant Meteorological Services as required.

5.22 Council was informed that the SWFDP was being developed in four phases: 1) Overall Planning; 2) Implementation plan development and execution; 3) Demonstration; and 4) Operational (no longer a project). Phases 3 and 4 would include capacity building through training of Meteorologists, Public Weather Service focal points and the media. Council was informed that the Development of a *Regional Sub-Project Implementation Plan* (RSIP) for the SWFDP was expected to be completed by the end of 2017, with the demonstration phase expected to begin in June-July 2018. Council was informed that the Expert Group sought to identify a regional entity to manage the program in phase 4 and that it had agreed that the *Caribbean Meteorological Organization* (CMO), through its Headquarters and organs, would be the regional entity to support SWFDP in the operational phase.

#### **5(h) The 2017 Session of the WMO Regional Association IV**

5.23 Council was briefed on the outcome of the 17<sup>th</sup> Session of the *WMO Regional Association IV* (North America, Central America and the Caribbean), which met from 27-31 March 2017 in San José, Costa Rica. Antigua and Barbuda, Barbados, Belize, the British Caribbean Territories, Jamaica and Trinidad and Tobago were the CMO Member States that attended the session. The Association examined the implementation of the regional components of the global programmes set in motion by the WMO Congress.

5.24 At this session, the Regional Association re-elected *Mr Juan Carlos FallasSojo* (Costa Rica) as its President and *Dr. Albert Martis* (Curaçao and Sint Maarten) as its Vice-president for the next four-year period.

## 5.25 **The Council:**

- (i) **Noted** the key issues emanating from the 2017 session of the Executive Council (EC) of the **World Meteorological Organization**;
- (ii) **Urged** CMO Member States to ensure that their NMHSs accelerate activities during the Pre-Operational Phase of WIGOS (2016-2019) period;
- (iii) **Urged** Member States to **complete the process** for reception of the new GOES-16 weather satellite data and products before the termination of transmission of the current satellite.
- (iv) **Continued** its strong support for the *Global Framework for Climate Services* and **urged** Member States to actively participate in GFCS projects and activities as appropriate;
- (v) **Noted** the important issues emerging from the 16<sup>th</sup> session of WMO *Commission for Basic Systems*(CBS-16);
- (vi) **Recognized and commended** the formal designation of the CIMH as a WMO Regional Climate Centre (RCC) for the Caribbean, and **urged** Member States to provide the CIMH with all the necessary support required to undertake this mandate;
- (vii) **Urged** Member States to review and complete any outstanding matters in their implementation of the ICAO-mandated *Quality Management System* (QMS) for meteorological services to aviation, taking particular note of deadlines set by the *International Civil Aviation Organization* (ICAO);
- (viii) **Continued its strong support** for the implementation of a WMO *Severe Weather Forecasting Demonstration Project* for parts of the region.

## 6. **FINANCIAL REPORTS**

### 6(a) **Status of Refundable Balances**

6.1 The Council was informed that among the sixteen Member States of the CMO, eight were also Member States of the World Meteorological Organization (WMO), while the five British Overseas Territories in the Caribbean collectively formed a single Member Territory of the WMO [called the *British Caribbean Territories* (BCT)]. The annual BCT contribution to the WMO was paid by the CMO Headquarters on behalf of the British Government and was therefore included in the annual budget of the CMO Headquarters, thus forming part of individual CMO Member States' contribution to the CMO Headquarters. A percentage of this amount was refunded to the CMO by the UK Department of Transport upon receipt of the annual Audited Statement of Accounts of the CMO Headquarters. Therefore this amount was refundable to the Member States that were also Member States and Territories of the WMO. The balance as of 30 September 2017 in both TTD and USD was as follows:

		USD *
<b><u>BRITISH CARIBBEAN TERRITORIES</u></b>	<b>TTD</b>	<b>BALANCE</b>
Anguilla	105,904	15,576
BVI	88,625	13,034
Cayman Islands	459,489	67,579
Montserrat	51,003	7,501
Turks and Caicos Islands	179,575	26,411
	<b>884,596</b>	<b>130,101</b>
<b><u>CMO MEMBERS OF WMO</u></b>		
Antigua & Barbuda	13,894	2,043
Barbados	30,183	4,439
Belize	21,985	3,233
Dominica	17,650	2,596
Guyana	15,886	2,336
Jamaica	197,383	29,030
Saint Lucia	11,287	1,660
Trinidad and Tobago	142,588	20,971
	<b>450,855</b>	<b>66,308</b>
<b>TOTAL</b>	<b>1,335,452</b>	<b>196,409</b>

\* USD equivalent calculated at rate of exchange at September 20th, 2017

6.2 By Members' consent, these funds were held by the CMO Headquarters Unit to assist Members in attending important Met/Hydro Meetings, participating in training opportunities and purchasing spares. They had been used very effectively in pursuit of these objectives, including during 2017.

6.3 The amounts shown in paragraph 6.1 were first calculated for accounting and auditing purposes. However, as the BCT contribution to WMO was included in the individual CMO Member State's contribution to the CMO Headquarters, disbursement was contingent upon countries meeting the annual contributions to CMO on a regular basis. Therefore, the actual amount available for drawdown by each State was linked to their financial status to the Organization. In keeping with a decision made during the 47<sup>th</sup> session of the Council (2007), each session of the Council was provided with the actual amount of refundable balance that each Member State was entitled to and the amount available for drawdown, as shown in the table below:

	USD *	USD AVAILABLE FOR USE
<b><u>BRITISH CARIBBEAN TERRITORIES</u></b>		
Anguilla	15,576	15,576
BVI	13,034	13,034
Cayman Islands	67,579	67,579
Montserrat	7,501	7,501
Turks and Caicos Islands	26,411	26,411
	<b>130,101</b>	<b>130,101</b>
<b><u>CMO MEMBERS OF WMO</u></b>		
Antigua & Barbuda	2,043	-
Barbados	4,439	4,439
Belize	3,233	-
Dominica	2,596	-
Guyana	2,336	2,336
Jamaica	29,030	5,000
Saint Lucia	1,660	1,660
Trinidad and Tobago	20,971	20,971
	<b>66,308</b>	<b>34,406</b>
<b>TOTAL</b>	<b>196,409</b>	<b>164,507</b>

\* USD equivalent calculated at rate of exchange at September 20th, 2017

6.4 The 56<sup>th</sup> session of Council (Grenada 2016) agreed that the basis used for apportioning the total refunded by the UK should be reviewed. A review was undertaken and it was confirmed that whilst the annual BCT contribution to WMO was included in the individual CMO Member State's contribution to the CMO Headquarters, non-BCT Members which are also members of WMO were not refunded the full amount included in their annual contribution to the CMO. Although the impact may be marginal, the CMO proposed to revise the basis of apportionment to ensure that these non-BCT Members which are also Members of WMO, receive a full refund of the amount included their contribution towards the annual BCT contribution to the WMO.

6.5 **The Council:**

**Noted** the status of the Refundable Balances Account, as well as the basis which would be used for apportionment of reimbursements effective from 2018.

6(b) **CMO HQ - Auditor's Report**

6.6 The financial statements of the CMO Headquarters Unit for 2016 were audited by the Auditor General's Department of the Ministry of Finance during May 2017. The audited financial statements for 2016 were presented to Council by the Finance and Administrative Officer.

6.7 **The Council:**

**Noted, Reviewed and Accepted** the audited Statement of Accounts for 2016, noting with pleasure that the CMO Headquarters received an unqualified audit report.

### 6(c) Statement of Contributions and Arrears (CMO HQ & CIMH)

6.8 The *Caribbean Meteorological Council* (CMC), as the Governing Body of the Caribbean Meteorological Organization (CMO), is responsible for approving the budgets of both arms of the CMO, namely the *Headquarters Unit* and the *Caribbean Institute for Meteorology and Hydrology* (CIMH). Each year, the Coordinating Director of the CMO and the Principal of the CIMH are challenged to hold the operating budgets of their institutions to a minimum with the hope that all Member States would meet their annual contributions towards these budgets in a timely manner.

6.9 Regrettably, delays in remittances, and non-payment by some Member States, had constrained the implementation of programmes and activities in the past and would soon affect core operations, if left unaddressed. The Council had repeatedly urged Member States to make regular payments toward the current approved budget and to establish a plan to liquidate arrears in a phased manner.

6.10 The pleas of previous sessions of the Council for Member States to make regular contributions bore some results during the 2014 – 2016 period as some ten Member States routinely made their full annual contributions, whilst an increasing number of Members States made an effort to liquidate their arrears in a phased manner.

6.11 The Auditor General of Trinidad and Tobago continued to raise concerns over the state of arrears in the Report on the Financial Statements of the CMO Headquarters Unit. By virtue of the persistent non-payment by some Member States, the accumulation of arrears and the absence of any formal plans to liquidate the arrears, contributions in arrears for more than one year were reclassified as non-current assets in accordance with *International Financial Reporting Standards* (IFRS), whilst only contributions in arrears for the current year were classified as current assets. Council discussed the fact that the implications arising from delays and non-payment of contributions were likely to impact the operations of the Headquarters Unit, since monies held by the CMO for Member States that operate rawinsonde and radar stations, as well as the Refundable Balances, had been classified as “restricted cash” in the Statement of Financial Position at the end of 2017 and were therefore not available to the Headquarters for use in operations.

6.12 In the case of the CIMH, Council was informed that during 2017, CIMH received approximately 56.82% of approved subventions. For the corresponding period in fiscal 2016, 47.26% of the approved budget had been received. High arrears remained a concern and during the audit, it was viewed by the Auditors as an irrecoverable sum.

#### 6.13 The Council:

**Examined** the Statements of Contributions and Arrears of the CMO Headquarters and the CIMH;

**Commended** the States which had made an effort to liquidate their arrears to the arms of the Organizations;

**Urged** Member States in arrears to make regular payments toward the current approved budget and to establish a plan to liquidate arrears in a phased manner.

## **7. CONSIDERATION OF A REVISED CMO CONTRIBUTION FORMULA FOR MEMBER STATES**

7.1 Council recalled the fact that, at the previous sessions back to 2014, it discussed the need for a revision of the formula that determined the level of contributions by Member States to the Organs of the CMO. The 56<sup>th</sup> session of the Council (Grenada, November 2016) decided that the CMO Headquarters would undertake a draft revision of the *CMO Contribution Formula* in 2017 by producing one version with the existing Member States of CMO and another version that would take into account a possible increase in membership of the CMO, namely by Suriname.

7.2 Council examined and deliberated in detail, the proposed revision of the CMO Contribution Formula, as prepared by the CMO Headquarters. The outline of the new Formula, in units form, is shown in **ANNEX IV**. Full details of the Contribution Formula will be made available to Member States in a separate CMO document.

### **7.3 Council:**

- (i) **Decided** that the proposed revised Contribution Formula was acceptable to all its Members in the form presented;
- (ii) **Accepted** the proposed Revised Contribution Formula, based on existing Membership of the Organization and, taking into account the varying budgetary cycles of Members States, **decided** that the Revised Contribution Formula would become effective from **2020**;
- (iii) **Decided** that the version of the Revised Contribution Formula with the inclusion of Suriname would be used if that country requested to become a Member State of the Organization. A similar methodology would be used if any other State requested membership of the CMO.

## **8. CMO BUDGETS (Headquarters Unit, CRN and Radar, CIMH)**

### **8(a) CMO HQ Budget Estimates for 2018**

8.1 In the presentation of the CMO Headquarters Budget Estimates for 2018, it was noted that during 2017, Trinidad and Tobago, the home of the CMO Headquarters Unit, experienced severe pressure on its foreign exchange reserves with a consequential fall in the value of the local currency. This had resulted in, and was expected to continue to cause, a negative impact on the operating expenses of the Headquarters Unit since its two major elements of costs were tied to foreign currencies. Base salaries were denominated in East Caribbean dollars (XCD) because of the link to the Caribbean Community, while foreign travel was closely linked to the United States dollar (USD). Further declines were anticipated in 2018; thus the budget proposed for the CMO Headquarters Unit provided for a decline of 6.3% over actual in the exchange rate for XCD and a decline of 6.6% over actual in the exchange rate for USD, based on economic indicators available to the CMO.

8.2 Council noted that the CMO Headquarters was set to incur significant one-time costs associated with the "changing of the guard" as the incumbent Coordinating Director would retire in 2018. Terminal costs obligations were accrued in 2015 and 2016. Therefore, the budget estimates for 2018 included only the first time costs associated with the relocation and the costs associated with a seven-month overlap period between the Incumbent Coordinating Director and the Coordinating Director-Designate.

8.3 For the budget for 2018, the CMO Headquarters considered both local and regional economic conditions and economic forecasts. The economic indications from some Member States at the time suggested that the economic difficulties experienced in 2017 would continue into 2018, while those Member States impacted by **Hurricanes Irma** and **Maria** in September 2017 would face a long road to recovery.

8.4 This paragraph has been deliberately removed from this version of the document.

8.5 Without considering the one-time and overlap costs described in paragraph 8.2 above, the budget estimates of expenditure for 2018 would reflect an increase of 4.2% in local currency (TTD) or 1.7% in USD, which is the currency used for invoices. However, with the inclusion of these one-time and overlap costs, the budget estimates of expenditure for 2018 in TTD reflect an abnormal increase of 23.2% driven by the cost of repatriating the Incumbent Coordinating Director and relocating the Coordinating Director-Designate to the headquarters in Trinidad, as well as emoluments and overseas travel during the overlap period.

8.6 The total estimates for the year 2018, upon which the contributions from Member States were based, was **TTD x,xxx,xxx**, or the equivalent of **USD xxx,xxx**. This TTD figure represented an increase of 23.2% in comparison to the 2017 figure of **TTD x.xxx.xxx**, but an increase of 20.3% compared to the USD equivalent of **USD xxx,xxx.xx** due to the anticipated depreciation of the TTD against the USD. As agreed by Council at CMC55 in Belize (2015), contributions to the CMO Headquarters, the Caribbean Rawinsonde and Radar Networks and the CIMH are payable in **United States currency**.

8.7 **The Council:**

- I. **Approved** the budget of **TTD x,xxx,xxx.xx**, equivalent to **USD xxx,xxx.xx**, as shown in paragraph 8.6 above and as outlined in **ANNEX V**, with Member contributions as indicated in **ANNEX VI**;
- II. **Approved** the extension of the employment contract of the incumbent Coordinating Director for a period of seven (7) months from 1 May to 30 November 2018 to cover the period of overlap between the incumbent Coordinating Director of the Organization and the Coordinating Director-Designate to ensure a smooth transition for the Organization;
- III. **Urged** Members to give priority to meeting annual contributions, through quarterly, bi-annual or more frequent part-payments if necessary, and to make every effort to pay off arrears to the Organization;
- IV. **Reminded** Members that when forwarding their contributions to CMO Headquarters by bank transfers, to deposit funds into the account noted on the invoice;
- V. **Also Urged** Members to inform the CMO Headquarters of their transfer of funds, including the date, amount and currency, in order to address difficulties in properly identifying the origin of funds within the banking system.

8(b) **CIMH Budget Estimates for 2018**

8.8 The Chairman of the Board of Governors informed the Council that the CIMH presented the Estimates of Expenditure for the financial year 2018 to the Board of Governors for its consideration. The total amount requested was **BBD x,xxx,xxx.xx** or **USD x,xxx,xxx..** This represented an increase of 1.45% over the estimates approved for fiscal 2017. Considering the importance of the work that the CIMH had been doing on behalf of Member States, the Board decided to recommend to Council that the requested budget estimates be approved.

8.9 **Council** held further deliberations on the proposal from the Board of Governors and:

**Approved** the Estimates of Expenditure for 2018 of **BBD x,xxx,xxx.xx** or **USD x,xxx,xxx.xx** for the CIMH, as presented by the Board of Governors. Member States' contributions based on that figure are indicated in **ANNEX VI**.

## 9. SUCCESSOR TO THE CMO COORDINATING DIRECTOR

9.1 Council recalled that, at its 54<sup>th</sup> session in Kingston, Jamaica (November 2014), the incumbent Coordinating Director, Mr Tyrone Sutherland, informed the Caribbean Meteorological Council of his intention to demit office in 2018. As a result, the 56<sup>th</sup> session of the Council set up the process to identify suitable candidates for the post, which would be brought to its 57<sup>th</sup> Session of CMC in November 2017 for deliberation and decision.

9.2 Council set up the following **Nomination/Interview Committee** to undertake the task in collaboration with the CMO Headquarters:

- (i) Member of the CMC Human Resources Committee: **Mrs Corse! Robertson**, Director of Airports, St. Vincent and the Grenadines [*Chair of Committee*];
- (ii) Regional Human Resource Expert: **Mr Phillip Brown**, Director, Human Resources and Administration, Caribbean Development Bank (CDB);
- (iii) International Expert: **Mr Oscar Arango**, Regional Representative, World Meteorological Organization (WMO);
- (iv) Retired Director of a National Meteorological Service: **Mr Chester Layne**, retired Director of the Barbados Meteorological Service.

The Incumbent Coordinating Director, **Mr Tyrone Sutherland**, served as a non-voting Advisor to the Committee. Non-voting Secretary to the Committee was **Mrs Natalie Araujo-O'Brien**, Finance and Administrative Officer, CMO Headquarters.

9.3 The Nomination/Interview Committee held its meeting from 9-13 October 2017 at the Headquarters of the Caribbean Development Bank (CDB) in Barbados. The Committee's role was to undertake the following assigned tasks:

- review the applications;
- undertake interviews;
- prepare a short list of preferred candidates for submission to the 57<sup>th</sup> session of the Caribbean Meteorological Council in November 2017.

9.4 The 57<sup>th</sup> session of the Council deliberated on the Report of the Nomination/Interview Committee in an in-camera session on 16 November 2017. The Chair of the Committee briefed the Council on the very modern and professional system used by the CDB for assessing applicants, which was deemed to be very rigorous and comprehensive and equally fair to all applicants. The Committee's report to Council indicated that there were 11 applications for the post, and after its work had been completed, it provided the Council with the names of two (2) of the candidates considered to be best suited for the post. The Council deliberated on the candidates proposed and decided to offer the post of Coordinating Director of the Caribbean Meteorological Organization to **Dr. Arlene Laing**, a national of Jamaica who, at the time, worked as a Scientific Analyst at the NOAA/Earth System Research Laboratory, Cooperative Institute for Research in the Atmosphere (CIRA) in Boulder, Colorado, USA. Council also decided that if, for whatever reason, Dr. Laing could not take up the post, it would offer the post to Mr. Keithley Meade of Antigua and Barbuda, the other suitable candidate presented to it by the Committee.

## 9.5 Council also:

- (i) **Confirmed** the decision of the 56<sup>th</sup> session of the Council that there should be an overlap period of six (6) months between the selected candidate (Coordinating Director-Designate) and the outgoing Coordinating Director, with that period to include the WMO Executive Council in June 2018 and the 58<sup>th</sup> session of the Caribbean Meteorological Council in November 2018;
- (ii) **Agreed** with the recommendation, particularly from the British Overseas Territories, that every effort should be made for the incoming Coordinating Director, as the Permanent Representative of the British Caribbean Territories with WMO, to retain a seat on the WMO Executive Council;
- (iii) **Decided** that the commencement of duty will be 1 June 2018 or at a date as soon as possible thereafter;
- (iv) **Decided** that the incumbent Coordinating Director's contract be extended to 30 November 2018 to accommodate the transition period;
- (v) **Authorized** the incumbent Coordinating Director of CMO to inform the chosen candidate of the decision of the Council, through the Chair of the Council, and for the CMO Headquarters to initiate all necessary measures for the commencement of duty of the Coordinating Director-Designate;
- (vi) **Requested** the CMO Headquarters to prepare, in collaboration with the Chairperson of the CMC Human Resources Committee, an appropriate transition plan for the overlap period referred to.

## 10. ANNUAL MEETING OF THE DIRECTORS OF METEOROLOGICAL SERVICES

10.1 The Caribbean Meteorological Council considered the Report of the Annual Meeting of Directors of Meteorological Services, held on 15 November 2017, presented by Mr Glendell De Souza, Science and Technology Officer of the CMO Headquarters. The Report provided the Council with the following summary of the deliberations and recommendations of the Directors on a wide range of technical and scientific topics, which would have an impact on future costs, policy decisions, training opportunities and service delivery. The following three items were drawn to the attention of Council:

### 1. *Training*

The Caribbean Institute for Meteorology and Hydrology (CIMH) recognized that Mathematics continued to be a problem for students in 2017 and this problem could be exacerbated by the University of the West Indies' movement away from 4-credit courses to 3-credit courses. This meant that students pursuing a degree in Meteorology may now have to take as many as five Mathematics courses in the new 3-credit course paradigm rather than the two courses under the 4-credit course system. A possible solution to reduce the number of Mathematics courses under the 3-credit system was being investigated and a future Meeting of the Directors of Meteorological Services (DMS) would be provided with the solution.

### 2. *Impact-Based Forecast and Warning Services*

The primary responsibility of National Meteorological and Hydrological Services (NMHSs) is to provide timely and accurate forecasts and warnings of meteorological events and hazards. However, in order for governments, economic sectors and the public to take appropriate action, they need to know how the meteorological hazard would impact their lives, livelihoods, property and the economy.

It was recognized that understanding disaster risk and forecasting meteorological impacts were generally beyond the remit of only meteorologists and hydrologists. The risk associated with a meteorological hazard depends on the knowledge of how that hazard may impact human beings, their livelihoods and assets, due to their vulnerability and exposure. Hence, a new paradigm was needed to progress from providing the meteorological forecast (what the weather will be) to the impact of a hazard (what the weather will do). Such forecasts would ensure that critical weather information was communicated about societal impacts to individuals and sectors most at risk.

### 3. *National Implementation Plans of the WMO Integrated Global Observing System (WIGOS)*

National Meteorological and Hydrological Services (NMHSs) were expected to become the key integrators at the national level, both by strengthening their own observing systems according to the regulations and guidance provided by the WIGOS framework, and by building national partnerships and providing national leadership based on their experience in the acquisition, processing and dissemination of observational data for environmental monitoring and prediction purposes.

The leadership role of NMHSs in integrated observing systems and the engagement with national partners was central to the success of WIGOS implementation. WIGOS provided an opportunity to strengthen the role of NMHSs in all aspects of their national mandates, from national coordination and exchange of observations across all relevant domains and to reinforce their status as the national meteorological and hydrological service provider of choice.

NMHSs operate in a rapidly changing environment in terms of technological advances and the increasing demand for more and more diverse services from increasingly sophisticated and capable users. To assist NMHSs to meet the increasing demand for services, it was expected that by the 18<sup>th</sup> World Meteorological Congress (Cg-18) in 2019, all Member States should be “WIGOS Ready” according to the overall WMO Plan for the WIGOS pre-operational phase. To achieve at least the minimum expected outcomes of the pre-operational phase, all NMHSs in CMO Member States must develop and implement a National WIGOS Implementation Plan.

## 10.2 **The Council:**

**Noted**, with some minor amendments, the Report of the 2017 Meeting of the Directors of Meteorological Services.

## 11. **CMO WEATHER RADAR NETWORK**

11.1 Council recalled that the CMO Weather Radar Network comprised of six S-band Doppler radars, namely, the US-made radar in Jamaica, installed in 1999; and five German-made radars in Belize, Barbados, the Cayman Islands, Guyana and Trinidad and Tobago. This network, along with other pre-existing radars in other Caribbean islands, provided the Caribbean with a modern sophisticated tool that complements other surface, upper-air and satellite-based weather observing platforms, as part of the regional early weather warning system.

11.2 The radars in the CMO Member States have a significant impact on weather surveillance, forecasts and warnings in the Caribbean. The reliance on the system had been growing within and outside of the region and, under the auspices of the *World Meteorological Organization (WMO)*, plans had been in place to integrate, in stages, the data from these radars with all other radars in the entire Caribbean basin, as part of a larger weather surveillance system. For a CMO-wide or the larger Caribbean-wide radar network to properly function, all radar-operating States need to work steadily to ensure reliability of their individual radar operations.

**(a). Status of CMO Radar Network Operations**

**Operational Status**

11.3 Council was informed that 2017 was not as good a year as 2016 in terms of radar availability. The furthest east of the radars, Barbados, had a major outage in November 2016. The component that failed had to be rebuilt by the manufacturer in Germany. That was a prolonged process that was not resolved until early November 2017. The other radars operated quite steadily throughout the year, except that the radar in Guyana also had a prolonged maintenance outage from September 2017.

11.4 The **Representative of Jamaica** briefed the Council about the status of the project underway in Jamaica for the replacement of its existing radar, which had been installed in 1999, with a new S-band dual-polarised radar. It was hoped that the project implementation would get underway in 2018 to be completed in 2019. In an answer to questions about what would become of the existing radar, the Representative indicated that it would be too expensive to utilize that radar to provide coverage over difficult sectors, such as to the northeast of the country.

11.5 The session also discussed the availability of radar on the Websites of the National Meteorological Services, including data from the Composite system developed by the Barbados Meteorological Service. Council **urged** Services utilizing the composite to liaise with the Barbados Meteorological Service to facilitate proper access and use. The wider use of weather radar data by the television media was also **encouraged**. Recognizing that the radar composite generated by Barbados had become a primary tool in the region, Council once more **urged authorities in Barbados** to provide formal support for the regional radar composite, so that it would be accepted as an input into the *WMO Integrated Global Observing System (WIGOS)*.

**12. OTHER PROJECT UPDATES AND PROPOSALS**

**12(a) Finland Initiative - Complementary Project to the SIDS Caribbean Project and SHOCS I and II (COPS)**

12.1 Council recalled that, between 2001 and 2004, the Government of Finland funded the SIDS-Caribbean Project titled "*Preparedness to Climate Variability and Global Change in Small Islands States, Caribbean Region*". This was followed by a project entitled "**Strengthening Hydrometeorological Operations and Services in the Central America and the Caribbean (SHOCS)**".

12.2 Phase I of SHOCS, called SHOCS I, was implemented between 2010 and 2012 with a budget of 0.5 million Euros. A Phase II, called SHOCS-II, was implemented between 2013 and 2015 with a budget of one Million Euros. The Project was implemented by the Finnish Meteorological Institute (FMI) in partnership with the *Association of Caribbean States (ACS)*, WMO and CMO. The beneficiaries of the Project have been the National Meteorological and Hydrological Services (NMHS) and Disaster Management Agencies in participating countries, along with the CIMH as a regional institution.

12.3 At the conclusion of SHOCS-II, there were residual funds available from the components of SIDS and SHOCS, so that the Project Board identified priorities for capacity building during a continuing phase called the **Complementary Project to the SIDS - Caribbean Project and SHOCS I and II (COPS)**.

12.4 In this regard, the COPS Project commenced late in 2016 and was expected to end late in 2017. The CMO Headquarters arranged for some COPS funds to be used to support training for some radar technicians in Belize. The work plan included updating of software in the in-country missions which assured that the region had the newest software available in utilization. On FMI's behalf, some of the activities had been intentionally scheduled to latter half of 2017 due to the software development work (especially with SmartAlert software) done at FMI.

12.5 The plan for the last quarter of 2017 was to conduct in-country training missions to SmartMet "main site" countries (Antigua and Barbuda, Cuba and Jamaica) by FMI experts, each mission lasting one week. Each mission was conducted by one FMI forecaster trainer and one FMI IT trainer with the training given to SmartMet and SmartAlert systems jointly during the same mission.

12.6 The **Representative of Antigua and Barbuda** thanked FMI for the support provided over the life of the projects. The SmartMet had assisted Antigua and Barbuda tremendously in providing forecasts and alerts to Antigua and Barbuda, Anguilla, the British Virgin Islands, Montserrat and St. Kitts and Nevis.

#### **12(b) Lightning Detection System**

12.7 Council recalled that, in the past, the CMO Headquarters indicated its intention to establish a ground-based Lightning Detection System in the region in partnership with the Meteorological Service of France [Météo-France]. The CMO Headquarters has studied this system in great detail and was of the opinion that such a system was very necessary in the Caribbean. In 2012, the CMO Headquarters reported to the 52<sup>nd</sup> session of the Council, the results of a demonstration period of a long-range lightning detection system that showed its tremendous value to the prediction of severe weather in the region.

12.8 A long-range system can acquire lightning data over the oceanic areas associated with weather systems that are well outside of radar range. At this distance, the resolution of the data at these distances is not critical. However, at distances closer to land, higher accuracy and thus a high-resolution detection were necessary. **Ground-based systems** use triangulation from sensors at multiple locations to determine location of the lightning flash. Therefore, for this higher resolution to be achieved, it would be necessary to install some lightning sensors along the island chain to allow for adequate triangulation.

12.9 The 52<sup>nd</sup> session of the Council discussed three basic options for consideration for an island-chain set of sensors; (i) the number and location of processing units for the data; (ii) the mode of transmission among the countries involved and (iii) the method of paying for the system. Over the years, the CMO Headquarters has received several proposals from a number of lightning-detection suppliers. The CMO Headquarters had not found the lease or rental approach to the acquisition of a lightning-detection system for the region to be viable since any failure to pay by the Member States would lead to the system being "turned off" or removed.

12.10 The CMO Headquarters asked the Council's 57<sup>th</sup> session to consider a capital project approach, in which international funding could be sought, in the same way as was done for the **CMO Radar Project**, through an internationally-tendered process, in which the equipment purchased and installed under such a project would be owned and operated by the CMO for the benefit of all CMO Member States and the region in general. There would be the added possibility that lightning data could also be provided for a fee to interested parties that require such information for their commercial operations.

12.11 Council discussed the matter and endorsed the concept of a *CMO Lightning Detection Network*(CLDN). However, it was felt that more information was required as to the cost of, and a sustainability model for the system. The **Representative of Trinidad and Tobago** suggested that before a decision could be made on CLDN, the *GOES Lightning Mapper* (GLM), which would be available on the new GOES-East satellite, should be evaluated prior to deciding on the CLDN.

#### 12.12 **The Council:**

**Noted** the updated information on the Finland-funded Project Complementary Project to the SIDS-Caribbean Project and SHOCS I and II (COPS);

**Discussed** the benefits to the Caribbean region of installing an operational ground-based lightning detection system;

**Requested** CMO Headquarters to seek further information on the cost of the system and sustainability model which can be used and inform next session of the Council;

**Requested** Members to evaluate the GOES Lightning Mapper (GLM) during the next year.

### 13. **ANY OTHER BUSINESS**

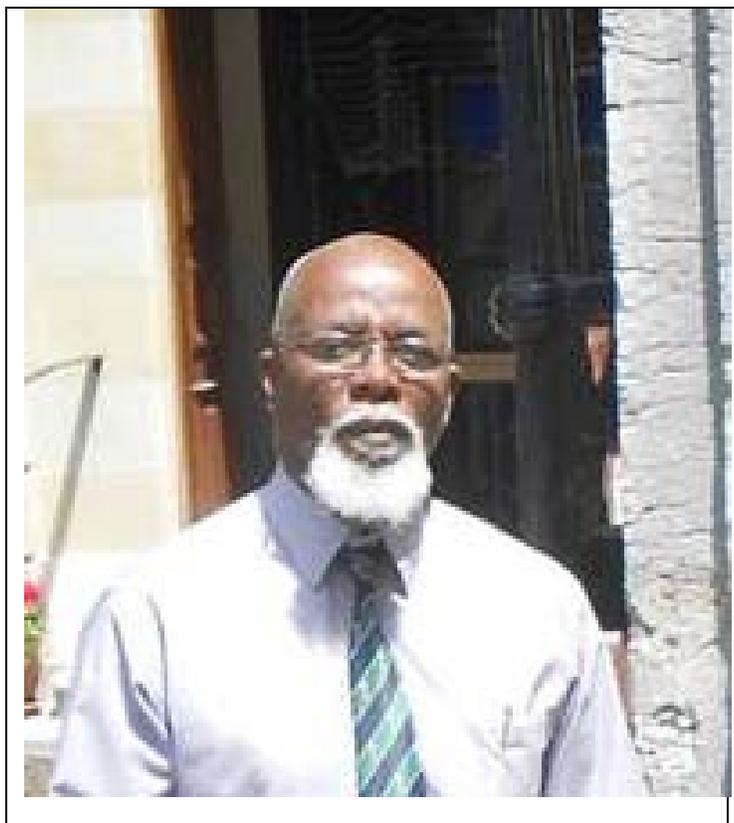
13.1 Council recalled that an ad-hoc Human Resource Committee had been created by CMC54 (Jamaica, 2014). At that time, the Committee comprised Mr Denzil Jones (Montserrat, Chairman), Mrs Vidiah Ramkhelawan (Trinidad and Tobago) and Mrs Corsel Robertson (St. Vincent and the Grenadines), with a mandate to look at the administrative procedures and processes at both CMO Headquarters and CIMH, particularly in relation to the recruitment, employment and retention of key post holders, such as the Coordinating Director of CMO and the Principal of the CIMH.

13.2 The Council discussed the fact that there were some matters outstanding from the Human Resource Committee in relation to the Principal's terms of employment. Council recognized that two of the three HR Committee members had moved on to other areas, which was considered as a possible reason why matters outstanding had not been completed. Council therefore replaced those members with two new persons, so that the CMO Human Resource Committee would now comprise *Mrs Corsel Robertson* (Chair), *Mr Andrew Gittens* of Barbados and *Mr John Smith* of the Turks and Caicos Islands. The Committee was mandated to revisit outstanding matters, in collaboration with the Coordinating Director and the CIMH Principal, with the aim of providing the Council Chair with concrete proposals for resolutions by mid-2018.

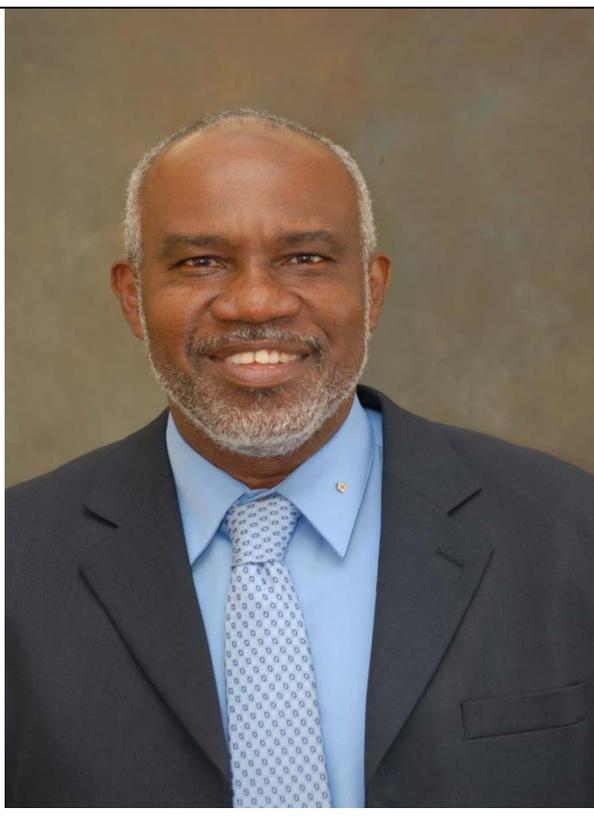
13.3 The **Representative of Grenada** informed Council that some Member States, such as Grenada and St. Kitts/Nevis, were considered to be "Tsunami-ready". He urged that other Member States look into their state of readiness.

13.4 Council discussed aspects of the *Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company* (CCRIF SPC) applications in the islands, particularly where there were States with more than one island in their composition. It was suggested that Member States may wish to examine whether risk insurance was appropriate for such States as a unit, or whether it would be better to consider risk insurance for each island component of such States.

13.5 Council was informed by the **Delegation of Barbados** that *Mr Hampden Lovell* had retired as the Director of the Barbados Meteorological Service on 30 June 2017. Council also recognized the retirement of *Mr Denzil Jones* as Airport Manager in Montserrat on 31 March 2017. Council congratulated Mr Lovell and Mr Jones on their achievements, thanked them for their sterling services to their countries and the region and wished them well in the future.



**Mr Hampden Lovell, Barbados**



**Mr Denzil Jones, Montserrat**

#### **14. DATE AND VENUE OF CMC58 (2018)**

14.1 Council invited Member States to indicate their willingness to host the next session, CMC58, in 2018. Council also encouraged Member States to also give consideration to CMC59 in 2019. The Coordinating Director indicated that he would contact various Member States in the near future with the hope that a host for CMC58 could be identified.

#### **Close of Meeting**

14.2 There being no other business, the Meeting ended with an exchange of courtesies.

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## SPECIAL TRIBUTE:

The Caribbean Meteorological Council expresses its deep sorrow at the sudden passing of **Mr Franklin Penn**, Delegate from the British Virgin Islands, who lost his life in a tragic manner in his homeland on November 22 - just days after returning from attending the 57<sup>th</sup> session of the Council in



Antigua and Barbuda. **Franklin Penn**, a Senior Air Traffic Control Officer and Meteorological Services Assessor in the British Virgin Islands, was a fairly regular participant for the BVI at the Caribbean Meteorological Council and related meetings. Mr Penn began his career with the Civil Aviation Department in the BVI on February 1<sup>st</sup> 1996 as an Air Traffic Control Trainee and was later transferred to the BVI Airports Authority on 1<sup>st</sup> June 2006. Along with his formal training as an Air Traffic Control Officer, he was trained at the *Caribbean Institute for Meteorology and Hydrology* as a Weather Observer. He rose through the ranks and was second in command to the Air Traffic Services Manager. He was a very loyal and dedicated worker who remained true and faithful to his job right down to the very end. He will be missed in his homeland, as well as in the meteorological community throughout the Caribbean.

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**AGENDA**

1. OPENING OF SESSION AND ELECTION OF CHAIRMAN
2. ADOPTION OF AGENDA AND PROCEDURAL MATTERS
3. CMO EXECUTIVE REPORTS
  - (a) Coordinating Director's Report
  - (b) CIMH Principal's Report
  - (c) CIMH Board of Governors' Report
4. STATUS OF ACTIONS FROM PREVIOUS SESSION
5. SPECIAL CMO AND WMO ISSUES
  - (a) Outcome/Highlights of the 2017 Executive Council (EC) of the World Meteorological Organization
  - (b) WMO Integrated Global Observing System – Pre-Operational Phase
  - (c) Reception of new Geostationary Satellite Imagery in CMO Member States
  - (d) The Global Framework for Climate Services (GFCS)
  - (e) Issues emerging from the 16<sup>th</sup> session of WMO Commission for Basic Systems
  - (f) Aeronautical Meteorological Services – Priority Activities
    - (i) Progress in the Implementation of Quality Management Systems (QMS)
    - (ii) Staff Competency Standards and Training
  - (g) Tropical Cyclone Programme and Regional Severe Weather Forecasts and Warning Systems
  - (h) The 2017 session of the WMO Regional Association IV
6. FINANCIAL REPORTS
  - (a) Status of Refundable Balances
  - (b) CMO HQ - Auditor's Report
  - (c) Statement of Contributions and Arrears (CMO HQ & CIMH)
7. CONTRIBUTION FORMULA  
Consideration of a revised CMO Contribution Formula for Member States
8. CMO BUDGETS (Headquarters Unit, CRN and Radar, CIMH)
  - (a) CMOHQ Budget Estimates for 2018
  - (b) CIMH Budget Estimates for 2018

9. SUCCESSOR TO THE CMO COORDINATING DIRECTOR
  10. ANNUAL MEETING OF THE DIRECTORS OF METEOROLOGICAL SERVICES
  11. CMO WEATHER MEETING OF RADAR NETWORK
    - Status and operations of CMO Radar Network Operations
  12. OTHER PROJECT UPDATES AND PROPOSALS
    - (a) Finland Initiative - Complementary Project to the SIDS Caribbean Project and SHOCS I and II (COPS)
    - (b) Severe Weather Forecast Demonstration Project (SWFDP)
  13. OTHER MATTERS
  14. DATE AND VENUE OF CMC58 (2018)
-

**ANNUAL MEETING OF THE CARIBBEAN METEOROLOGICAL COUNCIL**  
**ST. JOHN'S, ANTIGUA AND BARBUDA**  
**16<sup>TH</sup> - 17<sup>TH</sup> NOVEMBER 2017**

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**AMENDMENT #2 TO THE CARIBBEAN METEOROLOGICAL ORGANIZATION  
HEADQUARTERS STAFF TERMINAL BENEFIT FUND PLAN**

**Reason for the Amendment:**

In November 2016, an employee of the Caribbean Meteorological Organization parted life. The employee had been a member of the CMO Headquarters Staff Terminal Benefit Fund (TBF) Plan, which provides for a lump sum payment on retirement, resignation, retirement on the grounds of ill health, redundancy or at the end of a contract period. The employee had opted to retire on the grounds of ill health, thereby qualifying for benefits. Regrettably, the employee parted life shortly thereafter. In accordance with the law, the employee's benefits from the TBF are payable to the Employee's Estate. Considering that the employee died shortly after retiring on the grounds of ill health, the question was raised about what would have been the legal status of the contributions made to the TBF on the death of this or any employee while still in employment.

The CMO Headquarters sought and received a legal opinion on this matter from a senior Attorney-at-law in the Office of the Solicitor-General of Trinidad and Tobago.

In summary, the legal opinion was that the TBF, in its existing form in 2017, does not make provision for payment in respect of any condition not stated therein, in particular there is no expressed payment upon the death of an employee. This is not expressly catered for in the TBF and therefore is not an option upon which one can be expressly entitled to receive payment. As currently structured, any employee of the CMO who is a member of the TBF and who dies, would not receive a payment as he or she would not have qualified for any benefit under Clause 1.

For the TBF to cater for any such payment, the TBF must be amended accordingly to include such a provision. Any amendment to the TBF must be via **Clause 15** of the TBF, which provides:

*15. The Employer with the written consent of the Council may at any time by Supplemental Deed make any amendments or additions to the Trust Deed provided that no such amendment or addition shall:*

- a) Vary the main object of the Plan;*
- b) Vary the rights of any employee in respect of benefits already accrued under the Plan and to which such employee shall have become entitled without the consent in writing of such employee;*
- or*
- c) Result in the payment of any part of the Plan or any benefits of the Plan to the Employer.*

Under the aforementioned **Clause 15**, the TBF can be duly amended to include a provision for payment (for example, "*on the death of the employee*"). The effect of this amendment (or any similar amendment) would be to provide lump sum payment upon the death of an employee (or as the case may provide according to the amendment made). The legal opinion is also that this amendment should also be in line with the other aspects of the separation provided for in Clause 1.

It was therefore recommended that **Clause 1** of the TBF be amended accordingly pursuant to Clause 15, that being to insert in a new sub-clause in Clause 1, that being, "**vi**" to read: "*on the death of an employee, after not less than ten (10) years of service or pro-rated between 6 – 10 years.*".

On the basis of the legal opinion sought and recommendation received from the Office of the Solicitor-General of Trinidad and Tobago and concurred with by the CCS General Counsel, the 57<sup>th</sup> **Caribbean Meteorological Council**(2017) approved a second amendment to Clause 1 of the Deed of the CMO Headquarters Staff Terminal Benefit Fund, in order to bring the Deed in line with similar Staff terminal benefit funds that expressly cater for payment upon the death of the employee, as shown below with the previous and amended text:

TBF Introduction and Clause 1 Text 2014 (including Amendment #1):	TBF Clause 1 Text 2017 Approved Amendment #2 (shaded text):
<p><b><u>WHEREAS</u></b></p> <p>A. The Employer has determined to establish a <b>STAFF TERMINAL BENEFIT FUND PLAN</b> (hereinafter called “the Plan”) for the purpose of securing lump sum payments of moneys for such of its present and future employees employed at the Headquarters Unit in Trinidad and Tobago.</p> <p>B. The employer has agreed to undertake to pay every month fifteen percent of each employee’s salary into the Plan, or at the rate determined under the CARICOM Conditions of Service that apply to staff at the Caribbean Meteorological Organization Headquarters Unit, which will be payable in a lump sum, upon an employee satisfying the conditions of service listed at clause 1. The employer will also pay into the Plan for staff on short-term contracts, in accordance with the terms of the individual contracts. Contracts that are renewed will continue to function as part of the Plan.</p> <p><b>NOW THIS DEED WITNESSETH</b> as follows:-</p> <p>1. The object of the Plan is to provide for employees a lump sum payment on retirement or resignation, subject to the fulfilment of any one of the conditions of service listed hereunder:</p> <p>i) On retirement at age not less than fifty five (55) years, or</p> <p>ii) On resignation after not less than ten (10) years of service or pro-rated between 6 – 10 years, or</p> <p>iii) On retirement on grounds of ill health certified by a medical practitioner nominated or approved by the Trustees, or</p> <p>iv) Due to redundancy, or</p> <p>v) <b>At the end of a contract period, as determined by the terms of each individual contract.</b></p>	<p><b><u>WHEREAS</u></b></p> <p>A. The Employer has determined to establish a <b>STAFF TERMINAL BENEFIT FUND PLAN</b> (hereinafter called “the Plan”) for the purpose of securing lump sum payments of moneys for such of its present and future employees employed at the Headquarters Unit in Trinidad and Tobago.</p> <p>B. The employer has agreed to undertake to pay every month fifteen percent of each employee’s salary into the Plan, or at the rate determined under the CARICOM Conditions of Service that apply to staff at the Caribbean Meteorological Organization Headquarters Unit, which will be payable in a lump sum, upon an employee satisfying the conditions of service listed at clause 1. The employer will also pay into the Plan for staff on short-term contracts, in accordance with the terms of the individual contracts. Contracts that are renewed will continue to function as part of the Plan.</p> <p><b>NOW THIS DEED WITNESSETH</b> as follows:-</p> <p>1. The object of the Plan is to provide for employees a lump sum <b>payment, subject</b> to the fulfilment of any one of the conditions of service listed hereunder:</p> <p>i) On retirement at age not less than fifty five (55) years, or</p> <p>ii) On resignation after not less than ten (10) years of service or pro-rated between 6 – 10 years, or</p> <p>iii) On retirement on grounds of ill health certified by a medical practitioner nominated or approved by the Trustees, or</p> <p>iv) Due to redundancy, or</p> <p>v) At the end of a contract period, as determined by the terms of each individual contract, or</p> <p>vi) <b>On the death of an employee after not less than ten (10) years of service or pro-rated between 6 – 10 years.</b></p>

## Approved 2017 CMO UNITS SYSTEM (without and with Suriname)

(i) CCS Member States	(ii)(b) Adjusted 2017 CCS Assessment (%)	(iii)(b) 2017 CCS Units without Suriname	(iv)(b) New Radar Units (Post Radar Project)	(v)(b) Met Units	(vi)(b) New Total Assigned Units (Post Radar Project)	(ii)(c) Adjusted 2017 CCS Assessment (%) with Suriname	(iii)(c) 2017 CCS Units with Suriname	(iv)(c) New Radar Units (Post Radar Project)	(v)(c) Met Units	(vi)(c) New Total Assigned Units (Post Radar Project)
Anguilla	1.70	7	1	1	9	1.19	5	1	1	7
Antigua and Barbuda	3.03	12	5	16	33	2.53	10	5	16	31
Barbados	9.45	39	5	16	60	8.95	37	5	16	58
Belize	3.84	16	5	16	37	3.34	14	5	16	35
British Virgin Islands	2.36	10	1	1	12	1.85	8	1	1	10
Cayman Islands	2.59	11	5	16	32	2.09	9	5	16	30
Dominica	2.38	10	1	1	12	1.87	8	1	1	10
Grenada	3.03	13	5	16	34	2.53	10	5	16	31
Guyana	8.59	35	5	16	56	8.08	33	5	16	54
Jamaica	24.74	101	5	16	122	24.23	99	5	16	120
Montserrat	1.70	7	1	1	9	1.20	5	1	1	7
St. Kitts and Nevis	3.03	12	1	1	14	2.52	10	1	1	12
Saint Lucia	3.03	13	5	16	34	2.53	10	5	16	31
St. Vincent and the Grenadines	3.03	12	1	1	14	2.52	10	1	1	12
<b>Suriname</b>						8.08	33	5	16	54
Trinidad and Tobago	25.70	105	5	16	126	25.20	103	5	16	124
Turks and Caicos Islands	1.80	7	1	1	9	1.29	6	1	1	8
	<b>100.00</b>	<b>410</b>	<b>52</b>	<b>151</b>	<b>613</b>	<b>100.00</b>	<b>410</b>	<b>57</b>	<b>167</b>	<b>634</b>



**FINANCIAL INFORMATION REMOVED**



**FINANCIAL INFORMATION REMOVED**

