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Eighth Eastern Caribbean Civil Aviation Technical Group (E/CAR/CATG/8) Meeting
Miami, United States, 22 to 24 October 2024

- Agenda Item 4: Update of the E/CAR/CATG Work Programme and Activities**
4.2 ICAO NACC current projects and initiatives supporting the E/CAR region in ANS matters

THE ESTABLISHMENT OF A GEOMATICS UNIT IN THE TRINIDAD AND TOBAGO CIVIL AVIATION AUTHORITY

(Presented by Trinidad and Tobago)

EXECUTIVE SUMMARY	
To fulfil electronic Terrain and Obstacle Data (eTOD) and aeronautical charts as required in the Trinidad and Tobago Civil Aviation Regulations (TTCARs) and ICAO SARPs, a Geomatics Unit within the Air Navigation Services Division was established.	
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency• Economic Development of Air Transport
<i>References:</i>	<ul style="list-style-type: none">• Annex 14 Vol. I - Aerodromes• Annex 15 - Aeronautical Information Services (AIS)• Annex 4 - Aeronautical Charts• Document 8126 - AIS Manual• Document 8697 - Aeronautical Chart Manual• Document 9674 - World Geodetic System - 1984• Document 9881 - Guidelines for Electronic Terrain Obstacle and Aerodrome Mapping Information• Document 10066 - PANS Aeronautical Information Management (AIM)

1. Introduction

1.1 The Trinidad and Tobago Civil Aviation Authority (TTCAA), Air Navigation Services Division, in 2015 established a Geomatics Unit. The Geomatics Unit, is a highly technical and specialized Unit within the Aeronautical Information Management department.

1.2 The Geomatics Unit is responsible for acquiring and managing eTOD, as well as developing mandatory aeronautical charts for the State of Trinidad and Tobago. The staff of the Geomatics Unit are qualified with a Bachelor of Science in Geomatics Engineering.

1.3 The Unit's staff reviewed and studied the relevant ICAO Annexes and Documents to gain the aviation knowledge relevant for the management of eTOD and aeronautical charts.

1.4 This information paper aims to briefly outline the Geomatics Unit's mission and objectives, Scope of Operations and Key Technologies and Tools utilized.

2. Discussions

2.1 The Geomatics Unit fulfils management of geospatial data through the application of geospatial knowledge, skills and attitudes together with applicable geospatial technologies. The primary objectives include:

- a) Provision of accurate, timely and reliable terrain and obstacle data to support aviation operations.
- b) Acquisition of data and information through physical measurement or analysis of data received (e.g. LiDAR data analysis, Terrain modelling, conventional surveys).
- c) Management of a spatial database involving the security, maintenance and conformance of data to specifications specified by TTCARs and ICAO's SARPs.
- d) Coordination and collaboration with internal and external bodies for the acquisition of data and support.
- e) Evaluation of obstacle data based on Obstacle Collection Surfaces, Obstacle Limitation Surfaces, and Obstacle Identification Surfaces. The unit develops obstacle evaluation reports in response to requests from external stakeholders, such as state agencies, specifically for the construction of structures like buildings, towers, and antennae that may impact these surfaces.
- f) Fulfilment of the AIM charting responsibilities of providing the necessary charts for the elements of the Aeronautical Information Publication for the Eastern Caribbean. This includes ensuring compliance with TTCARs and ICAO SARPs for chart production. Examples of mandatory charts include:
 - i. Aerodrome Obstacle Chart – ICAO Type A
 - ii. Instrument Approach Charts - ICAO
 - iii. Precision Approach Terrain Charts - ICAO
 - iv. En-route Charts - ICAO
 - v. World Aeronautical Chart – ICAO
- g) Facilitation of IFP Chart generation, involving the production of:
 - i. RNP/RNAV Approach Charts
 - ii. Conventional Approach Charts (e.g. ILS)
 - iii. Standard Instrument Departure Charts – Instrument (SIDs)
 - iv. Standard Arrival Charts – Instrument (STARs).

2.2 The Geomatics Unit scope of operations encompasses a myriad of activities such as:

- a) Use of satellite imagery through Google Earth Pro for horizontal verification of obstacles and surveillance of obstacles.
- b) Acquisition and processing of drone imagery and LiDAR data for obstacle collection and evaluation.
- c) Conventional and Global Navigation Satellite System (GNSS) Surveying for precise positioning and alignment of obstacles and aviation related features.
- d) Use of Geographical Information System (GIS) for spatial analysis, obstacle evaluations and cartographic composition including the development of aeronautical charts.

2.3 The AIM-Geomatics Unit has access to the following technologies internally as well as through State collaborations. These tools such as:

- a) Conventional survey equipment for real-time and accurate data collection of natural and man-made features for the purpose of mapping precise three-dimensional locations.
- b) Global Navigation Satellite Systems (GNSS), for accurate three-dimensional positioning and navigation.
- c) LiDAR (Light Detection and Ranging) technology for high-resolution terrain mapping and obstacle detection.
- d) Unmanned Aerial Vehicles (UAVs) for aerial surveys and monitoring of aviation infrastructure.

3. Conclusions

3.1 The Geomatics Unit is dedicated to supporting the Air Navigation Services and the broader Aviation community through the use of geospatial solutions to achieve the outlined objectives to ensure safety, efficiency and sustainability in the Piarco Flight Information Region and Aviation Industry by extension.

3.2 The meeting is invited to note the information presented.