ANTIGUA AND BARBUDA
State Air Navigation Plan

Date: November 6, 2018 –Draft

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Document History Record

Release	Date	Author(s)/Comments
Draft	November 6, 2018	Audrey Lorraine Davis (Air Traffic Services Operations Officer)
Version 1.0		

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1. Introduction

This document is Antigua & Barbuda's State Air Navigation Plan (ANP) describing the plan and status of aviation technology implementation. The background of the State ANP and the environment of our air navigation system are presented along with the method and process to evaluate and monitor aviation technology implementation.

1.1 Background

The ICAO Global Air Navigation Plan (Doc 9750, GANP) provides ICAO's vision to achieve sustainable growth of the global civil aviation system. It also presents all States with a comprehensive planning tool supporting a harmonized global air navigation system. The GANP is an overarching framework that includes key civil aviation policy principles to assist ICAO Regions and States with the preparation of their Regional and State Air Navigation Plans (ANPs).

Planning and Implementation Regional Groups (PIRGs) are expected to develop the regional ANPs reflecting the regional requirements. GANP obligates States to map their individual or regional programmes against the harmonized GANP, but provides them with far greater certainty of investment. GANP requires active collaboration among States through the PIRGs in order to coordinate initiatives within applicable regional ANPs.

The GANP introduces the Aviation System Block Upgrades (ASBU) methodology. The ASBU methodology and its description of future aviation capabilities define programmatic and flexible global systems engineering approaches allowing all States to advance their air navigation capacities based on their specific operational requirements.

To this extent, the North American, Central American and Caribbean (NACC) Regional Office (RO), has published the NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (RPBANIP, v3.1 in April 2014) aligning the activities and strategies with the ICAO ASBU methodology.

This document is the ANP for Antigua and Barbuda aligning activities and strategies to the GANP and RPBANIP. The information contained in the Antigua and Barbuda ANP is related mainly to:

- Planning: objectives set, priorities and targets planned at the state level
- Implementation monitoring and reporting: monitoring the progress of implementation towards targets planned. This information should be used for reporting purposes (i.e.: global and regional air navigation reports and performance dashboards); and/or
- Guidance: providing state guidance material for the implementation of specific system/procedures in a harmonized manner.

The Antigua and Barbuda ANP would be used as a tool for planning, monitoring, and reporting the status of implementation of the aviation capabilities.

1.2 Environment

The airport was built as a United States Army Air Forces base around 1941, and named Coolidge Airfield after Capt. Hamilton Coolidge (1895–1918), a United States Army Air Service pilot killed in World War I.

The Coolidge Air Force Base in 1948, was closed as a result of budgetary cutbacks in 1949.

Upon the closure of the base in 1949 it became a civil airport. It was known as Coolidge International Airport until 1985, when it was named V.C. Bird International Airport, in honor of Sir Vere Cornwall Bird Sr. (1910–1999), the first prime minister of Antigua and Barbuda.

In December 2005, the Antigua and Barbuda Millennium Airport Corporation announced it would invite tenders to construct the first phase of a new passenger terminal designed to serve the airport for 30 years. In 2006, the Antigua and Barbuda Airport Authority (ABAA) was established to replace the Antigua and Barbuda Millennium Airport Corporation. In 2012, they announced the construction of its second terminal.

The new terminal became operational on August 26, 2015. All flights operate from the new facility. The terminal covers 23,000 square meters (247,570 square feet), with four jet bridges, modern security screening facilities, up-to-date passenger processing and monitoring facilities, and a CCTV security system. It contains 46 check in counters, 15 self-check in kiosks, 5 baggage carousels, mini food court, multiple VIP lounges, retail stores, first class lounges, restaurants, and other facilities.

The old airport terminal is not fully out of use, as some administrative offices, the Air Traffic Services and Meteorological Services offices still remain there.
(*https://en.wikipedia.org/wiki/V._C._Bird_International_Airport*)

1.2.1 Authority of Antigua and Barbuda

Air Navigation Services are provided by the Government of Antigua and Barbuda through the Ministry of Public Utilities, Civil Aviation, Transportation and Energy (The ANSP). The departments which provide air navigation service on behalf of the Government are the Antigua and Barbuda Air Traffic Services and Antigua and Barbuda Meteorological Services.

The Antigua and Barbuda Airport Authority (ABAA) is a statutory body which falls under this Ministry. It was established by an Act of Parliament in November 2006. The mandate of this Statutory body was stated as "to provide for the establishment of an Airport Authority; to make provisions for the ownership, control, management and development of airports in Antigua and Barbuda; and for matters connected generally with management of airports". (*http://laws.gov.ag/acts/2006/a2006-17.pdf*) The Authority provides supporting services such as Aerodrome development and maintenance for the V. C. Bird International Airport on Antigua and the Codrington Airport located on Barbuda.

The organizational chart in Figure 1.2.1. shows the upper level of the organization which oversees the operation and is staffed by a highly motivated work force contributing to the sustainable, social and economic development of Antigua and Barbuda.

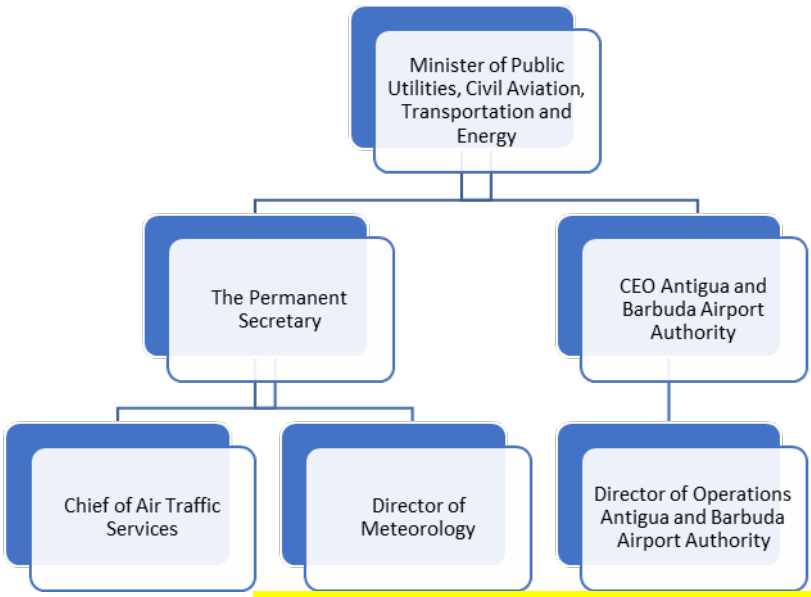


Figure 1.2.1: Organizational Structure of Antigua and Barbuda

1.2.2 Airspace

The V.C. Bird Terminal Control Area (TMA) is located at the most northerly end of the Piarco Flight Information Region (FIR) See Figure 1.2.2a. It extends laterally to 70 miles to the Northwest, 52 miles to the North, 27 Miles to the South and 60 miles to the Northeast with a vertical limit from 3000 ft. to FL240. The control zone extends from surface to 3000ft.

The TMA includes the islands of Barbuda, St. Kitts, Nevis, and Montserrat.
St. Kitts – Robert L. Bradshaw airport which controls a smaller TMA with a vertical limit of FL65 and a lateral limit of approximately 15miles and includes Nevis – Vance Amory Airport. The airport on Montserrat – John A. Osbourne - operates from sunrise to sunset. On Barbuda (part of the State) there are two uncontrolled airfields Codrington (state owned) and Coco Point (privately owned). See Figure 1.2.2b

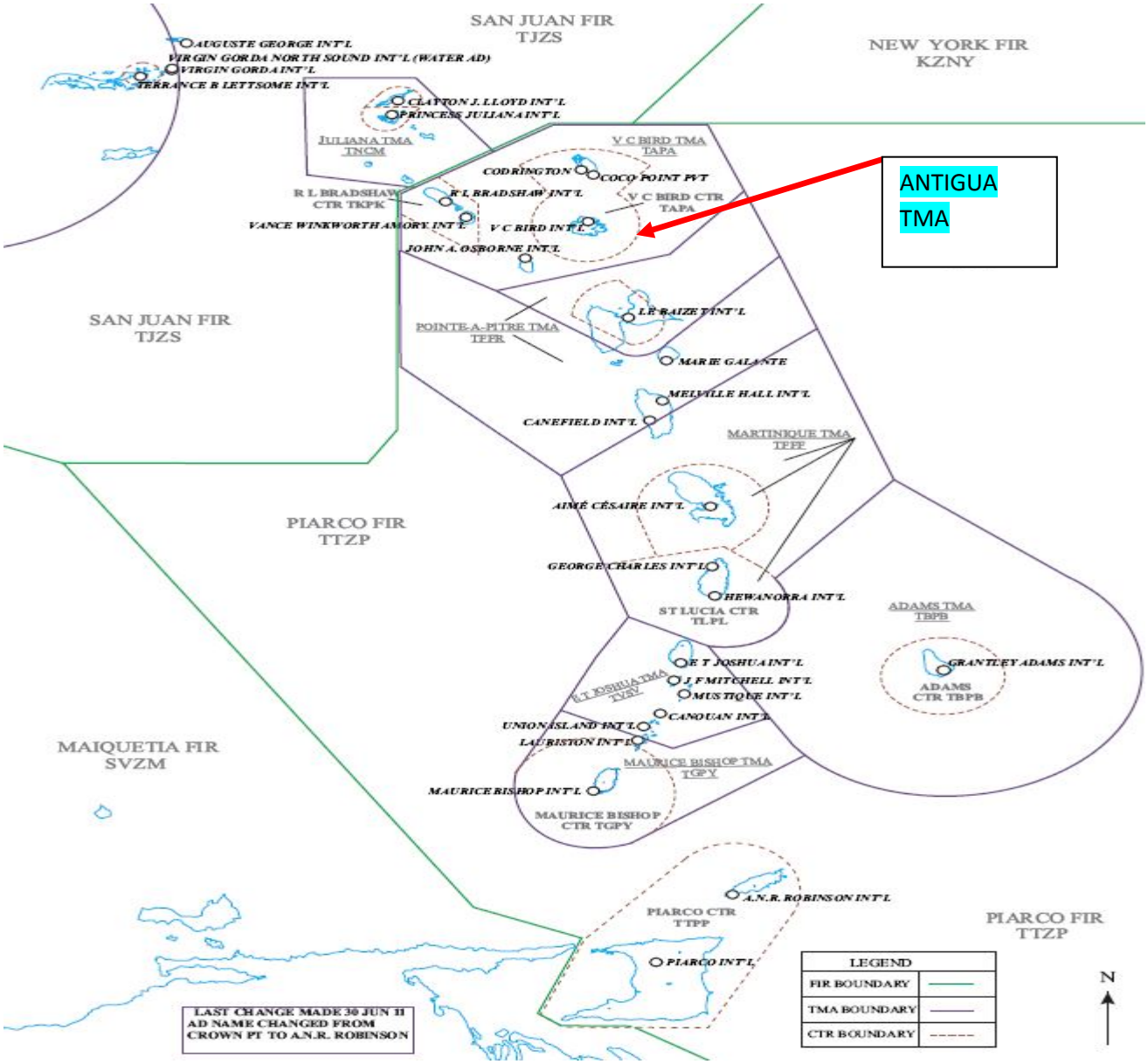


Figure 1.2.2a: Piarco FIR with V. C. Bird TMA

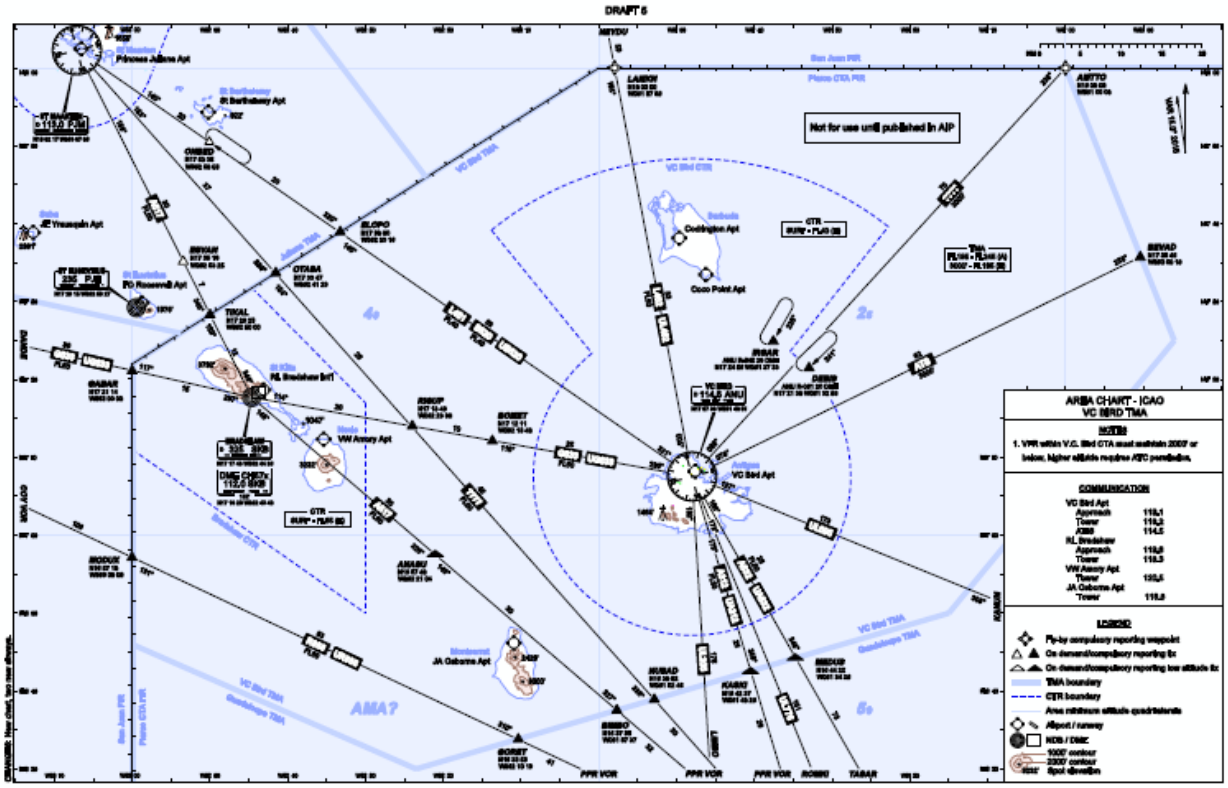


Figure 1.2.2b: V. C. Bird TMA

1.2.3 Aerodromes

The State of Antigua and Barbuda has one international airport – the V. C. Bird International Airport (TAPA) which is listed in the ICAO's regional ANP titled, "Caribbean and South American Air Navigation Plan, Volume I (dated October 2015), Table AOP I-1, International Aerodromes Required in the CAR/SAM Regions". With a single runway operation, it currently handles on average 3000 (2017) flights per month (100 per day). These figures include landings, departures with a mixture of IFR and VFR flights. I must be noted however, that a significant amount of traffic transits the airspace daily (60 flights eastbound and westbound) which contributes to the complexity of our traffic flow.

Runway Information on V.C. Bird Airport (TAPA) from the E. C. AIP

	Runway 07	**Runway 25**
Length x Width	8982ft x 150ft	8326 ft x 150ft
Surface Type	Concrete/Asphalt	Concrete/ Asphalt
TDZ-Elevation	58 ft	27 ft
Lighting	Edge	Edge
Displace Threshold	1640 ft	984 ft

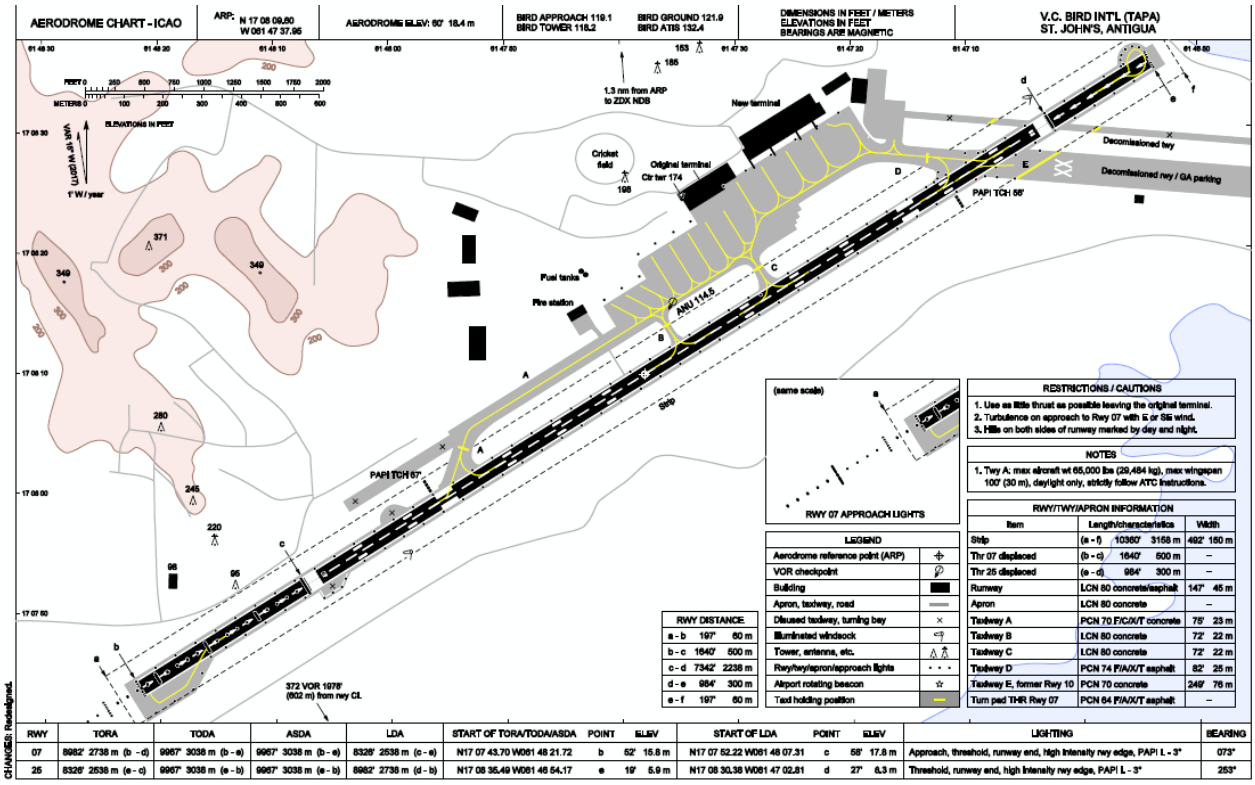


Table 1.2.3. V. C. Bird Aerodrome Chart (E. C. AIP)

1.2.4 Traffic Forecast

Average daily movements (arrivals/departures) at V.C. Bird International (TAPA) are 50 arrivals and 50 departures total of 100 movements. The RPBANIP forecasted that average annual growth of air traffic in the Caribbean region would increase 5.9% during 2011-2031. Antigua and Barbuda believes that this overall Caribbean regional forecast of annual increase of 5.9% is too optimistic. Therefore, a more moderate number of 3.0% annual increase is anticipated. Estimated daily operations at TAPA are shown in Tables 1.2.4 applying the increase forecasts to each year from 2017 to 2031. Table 1.2.4.shows the ICAO forecast as well as the regional/state forecast.

Year	5.9% Annual Increase	3.0% Annual Increase
2017	100	100
2018	106	103
2019	112	106
2020	119	109
2021	126	113
2022	133	116
2023	141	119
2024	149	123
2025	158	127
2026	168	130
2027	177	134
2028	188	138
2029	199	143
2030	211	147
2031	223	151

Table 1.2.4: Air Traffic Forecasts at V. C. International Airport (number of daily operations) using annual increase rates of 5.9% and 3%

1.3 Planning Methodology

Guided by the GANP and RPBANIP, the state planning process starts by identifying the state responsible ATM areas, major traffic flows and international aerodromes. An analysis of this data leads to the identification of opportunities for performance improvement. Available technologies and ASBU Elements are evaluated to identify which Elements best provide the needed operational improvements. Depending on the complexity of the selected technology or Elements, additional planning steps may need to be undertaken including financing and training needs. Finally, state plans would be developed for the deployment of improvements and supporting requirements. This is an iterative planning process which may require repeating several steps until a final plan with specific regional targets is in place. This planning methodology requires full involvement of States, service providers, airspace users and other stakeholders, thus ensuring commitment by all for implementation.

Considering that some of the ASBU Modules contained in the GANP are specialized packages of implementable capabilities, called Elements, that may be applied where specific operational requirements

or corresponding benefits exist, States will decide how each ASBU Element would fit into national and regional plans.

In establishing and updating the implementation priorities detailed in the Antigua and Barbuda ANP, due consideration should be given to the safety priorities set out in the Global Aviation Safety Plan (GASP) and the NAM/CAR regional safety strategy. Antigua and Barbuda would establish its own air navigation objectives, priorities and targets to meet its individual needs and circumstances in line with the global and regional air navigation objectives, priorities, and targets.

1.4 Air Navigation Planning Process

The air navigation planning process prescribes evaluation, implementation, reviewing, reporting, and monitoring activities. It is recommended to conduct the process on a cyclical, annual basis. An Air Navigation Reporting Form (ANRF) is a tool to monitor and report the implementation status of capabilities. The Antigua and Barbuda ANRF is a customized tool for the application of setting planning targets, monitoring implementation, and identifying challenges, measuring implementation/performance and reporting. The ANRF reflects selected key performance areas as defined in the Manual on Global Performance of the Air Navigation System (ICAO Doc 9883).

Many of the future capabilities are described in terms of ASBU Elements. Some capabilities are specific to the need of the Caribbean Region and/or the State needs. These specific needs are described as Regional Aviation System Improvements (RASI) and State Aviation System Improvements (SASI). Both Analysis and Work Flow and ANRF are useful to manage the implementation status of ASBU, RASI, and SASI capabilities.

1.4.1 Analysis and Work Flow Process

Figure 1.4.1 depicts the workflow for analysing and implementing ASBU Elements. This flow process should be applied to each of the ASBU Elements. If the Element is applicable to an airport, each airport needs to be evaluated through this flow process. This same flow process is applicable to RASI and SASI.

The significance of each step in the workflow as it pertains to regional planning is as follows:

- **Analysis Not Started** – The requirement to implement this ASBU Element has not yet been assessed
- **Analysis In Progress** – A Need Analysis as to whether or not this ASBU Element is required, is in progress
- **N/A** – The ASBU Element is not required
- **Need** - The Need Analysis concluded that the ASBU Element is required, but planning for the implementation has not yet begun
- **Planning** – Implementation of this ASBU Element is planned, but not yet started
- **Developing** – Implementation of this ASBU Element is in the development phase, but not yet operational
- **Partially Implemented** – Implementation of this ASBU Element is partially completed and/or operational but all planned implementations are not yet complete
- **Implemented** - Implementation of this ASBU Element has been completed and/or is fully operational everywhere the need was identified

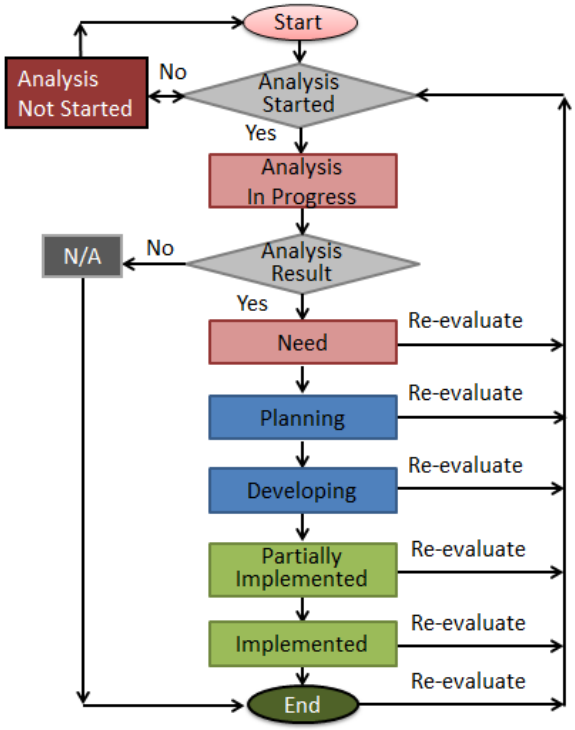


Figure 1.4.1: Analysis and Work Flow

The Need Analysis of ASBU Elements will identify which ASBU Elements are required. In this context, "required" means that the benefits estimated from the implementation would justify the associated implementation costs, or, the potential safety benefits are deemed to justify the implementation costs. The implementation status of ASBU Elements which are not required should be indicated as "N/A", meaning "not applicable".

The analysis and implementation status determined in accordance with the above is reflected in the applicable ANRFs and in the ASBU Implementation Status Tables.

1.4.2 Monitoring and Reporting Results

Monitoring and reporting results will be analyzed by the Regions, States and the ICAO Secretariat to steer the air navigation improvements, take corrective actions and review the allocated objectives, priorities and targets if needed. The results will also be used by ICAO and aviation partner stakeholders to develop the annual Global Air Navigation Report. The report results will provide an opportunity for the international civil aviation community to compare progress across different ICAO regions in the establishment of air navigation infrastructure and performance-based procedures. The reports will also provide the ICAO Council with detailed annual results on the basis of which tactical adjustments will be made to the performance framework work programme, as well as triennial policy adjustments.

The information provided in the Antigua and Barbuda ANRFs will be periodically reviewed and updated if subsequent analysis results in a change to the applicability of any ASBU Elements, whether or not they were selected. The explanation of ANRF is provided in Appendix A. The customized Antigua and Barbuda ASBU Air Navigation Reporting Form Template is provided in Appendix B. The Antigua and Barbuda RASI and SASI Air Navigation Reporting Form Templates are provided in Appendix C.

1.5 Problem Identification

To provide and promote safe and efficient aviation services to the customers, it is important to resolve ongoing challenges which hinders the smooth implementation. It is also important to anticipate and address the potential problems in the future.

1.5.1 Existing Problems

Civil aviation is a dynamic industry with many emerging technologies which requires States to constantly review and update their facilities and procedures. The demands on the V. C. Bird International Airport for these upgrades have increased and at times created many challenges. The lack or shortage financial and human resources are the main hindrances which delays the implementation of many of the requirements of the Global and Regional plans. The solutions require huge investment in Communication, Navigation and Surveillance infrastructure which have become outdated and, in some cases, have become obsolete.

One of the major challenges is to convince the appropriate authorities that these upgrades are necessary to provide an efficient service which will enhance the economic development of the State through thea vibrant Tourist Industry. Priority needs to be given to this area of the Ministry and not just in hotel development.

Another essential component in overcoming these challenges is the development of its human resources. Training in technical areas and attendance at workshops which provides awareness and understanding of the requirements is essential. This will allow more informed decision in determining what is required to meet our needs. The provision of relevant training for human resource is paramount.

1.5.2 Future Problems

If the current problems and challenges are not adequately addressed, then it stands to reason that situation such as infrastructure failures will result in ciaos which could escalate into unsafe state of affairs. This could negatively impact the entire industry and may require more resources to return to normalcy.

The human resource issues, if not addressed in tandem with the infrastructure and procedure development, could result in deficient service provision and delivery. Human resource acquisition and development must coincide with the infrastructure and procedure development.

2. Antigua and Barbuda's Aviation System Block Upgrade (ASBU) Implementation Status

The status of ASBU implementation is provided in this section. Though there are Block 0 to Block 4 (B0, B1, B2, and B3), only B0 capacities are ready to be implemented with supporting documents such as standards, procedures, specifications, and training materials. ICAO will provide supporting documents for B1 in 2019, B2 in 2025, and B3 in 2031.

2.1 ASBU Block 0 Implementation Metrics, Targets, and Status

ASBU B0 Implementation Targets and Status are presented in this section. Antigua and Barbuda considers one airports, i. e. the V. C. International Airport (TAPA) for airport oriented Elements.

2.1.1 ASBU B0 Implementation Metrics and Targets

Table 2.1.1 provides the ASBU B0 Implementation Metrics, Targets, and Progress for each B0 Element.

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
Performance Improvement Area 1: Airport Operations				
ACDM	**1.** Interconnection between aircraft operator & ANSP systems to share surface operations information	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or1* **c.** How many aerodromes implemented the capability? *None or1*	**B0-ACDM-1 Target 1:** Assessed in November 2016 **a.** Yes **b.** 1 (TAPA) **B0-ACDM-1 Target 2:** Implement in Nov 2016 **c.** 1	Status – Implemented
	2. Interconnection between aircraft operator & airport operator systems to share surface operations information	Number of aerodromes to be considered:1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None, 1,*	**B0-ACDM-2 Target 1:** Assessed in November 2016 **a.** Yes **b.** 1 (TAPA) **B0-ACDM-2 Target 2:** Implement in Nov 2016 **c.** 1	Status – Implemented
	3. Interconnection between airport operator & ANSP systems to share surface operations information	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None, 1,* **c.** How many aerodromes implemented the capability? *None, 1,*	**B0-ACDM-3 Target 1:** Assessed in Nov. 2016 **a.** Yes **b.** 1 (TAPA) **B0-ACDM-3 Target 2:** Implement in Nov.2016 **c.** 1	Status – Implemented
	4. Interconnection between airport operator, aircraft operator & ANSP systems to share surface operations information	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None, 1,* **c.** How many aerodromes implemented the capability? *None, 1,*	**B0-ACDM-4 Target 1:** Assessed in Nov. 2016 **a.** Yes **b.** 1 (TAPA) **B0-ACDM-4 Target 2:** Implement by Dec 2016 **c.** 1	Status – Implemented

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	5. Collaborative departure queue management	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-ACDM-5 Target 1:** Assessed in Dec 2016 **a.** Yes **b.** 1 (TAPA) **B0-ACDM-5 Target 2:** Implement by Dec 2016 **c.** 1	Status – Implemented
APTA	**1.** PBN approach procedures with vertical guidance to LNAV/VNAV minima	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-APTA-1 Target 1:** Assessed in April 2013 **a.** Yes **b.** 1 **B0-APTA-1 Target 2:** Implemented in April 2013 **c.** 1	Status –Partially Implemented
	2. PBN approach procedures with vertical guidance to LPV minima	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-APTA-2 Target 1:** Assessed in April 2013 **a.** Yes **b.** None **B0-APTA-2 Target 2:** **c.** N/A	Status – N/A
	3. PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-APTA-3. Target 1:** Assessed in April 2013 **a.** Yes **b.** None **B0-APTA-3 Target 2:** **c. N/A**	Status –N/A
	4. GBAS Landing System (GLS) Approach procedures	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-APTA-4. Target 1:** Assessed in April 2013 **a.** Yes **b.** None **B0-APTA-4. Target 2:** **c.** None	Status – N/A
RSEQ	**1.** AMAN via controlled time of arrival to a reference fix	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-RSEQ-1. Target 1:** Assessed in July 2013 **a.** Yes **b.** None **B0- RSEQ-1 Target 2:** **c.** N/A	Status – N/A
	2. Departure management	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-RSEQ-2. Target 1:** Assessed in July 2013 **a.** Yes **b.** None **B0-RSEQ-2. Target 2:** **c.** N/A	Status – N/A

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	3. Departure flow management	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-RSEQ-3. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-RSEQ-3. Target 2:** **c.** N/A	Status – N/A
	4. Point merge	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-RSEQ-4. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-RSEQ-4. Target 2:** **c.** N/A	Status – N/A
SURF	**1.** A-SMGCS with at least one cooperative surface surveillance system	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-SURF-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-SURF-1. Target 2:** **c.** N/A	Status – N/A
	2. Including ADS-B APT as an element of A-SMGCS	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-SURF-2. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-SURF-2. Target 2:** **c.** N/A	Status – N/A
	3. A-SMGCS alerting with flight identification information	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-SURF-3. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-SURF-3. Target 2:** **c.** N/A	Status – N/A
	4. EVS for taxi operations	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-SURF-4. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-SURF-4. Target 2:** **c.** N/A	Status – N/A
	5. Airport vehicles equipped with transponders	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-SURF-5. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-SURF-5. Target 2:** **c.** N/A	Status – N/A
WAKE	**1.** New PANS-ATM wake turbulence categories and separation minima	Number of aerodromes to be considered:1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-WAKE-1. Target 1:** Assessed in Nov 2016 **a.** Yes **b.** 1 **B0-WAKE-1. Target 2:** Implemented in Nov 2016 **c.** 1	Status – Implemented

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	2. Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	Number of aerodromes to be considered:1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-WAKE-2. Target 1:** Assessed in Nov 2016 **a.** Yes **b.** None **B0-WAKE-2. Target 2:** **c.** N/A	Status – N/A
	3. Wake independent departure and arrival procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-WAKE-3. Target 1:** Assessed in Nov 2016 **a.** Yes **b.** None **B0-WAKE-3. Target 2:** **c.** N/A	Status – N/A
	4. Wake turbulence mitigation for departures procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-WAKE-4. Target 1:** Assessed in Nov 2016 **a.** Yes **b.** None **B0-WAKE-4. Target 2:** **c.** N/A	Status – N/A
	5. 6 wake turbulence categories and separation minima	Number of aerodromes to be considered:1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-WAKE-5. Target 1:** Assessed in Nov 2016 **a.** Yes **b.** None **B0-WAKE-5. Target 2:** **c.** N/A	Status – N/A
Performance Improvement Area 2: Globally Interoperable Systems and Data				
AMET	**1.** WAFS	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-AMET-1.Target 1:** Assessed in July 2012 **a.** Yes **b.** Yes **B0-AMET-1.Target 2:** Implement by March 2013 **c.** Yes	Status – Implemented
	2. IAVW	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-AMET-2. Target 1:** Assessed in July 2013 **a.** Yes **b.** Yes **B0-AMET-2. Target 2:** Implement by March 2019 **c.** Yes	Status – N/A
	3. TCAC forecasts	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-AMET-3. Target 1:** Assessed in July 2013 **a.** Yes **b.** Yes **B0-AMET-3.Target 2:** Implement 2019 **c.** Yes	Status – Implemented
	4. Aerodrome warnings	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-AMET-4. Target 1:** Assessed in July 2013 **a.** Yes **b. 1** **B0-AMET-4. Target 2:** Implement by March 2018 **c.** 1	Status – Implemented

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	5. Wind shear warnings and alerts	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-AMET-5. Target 1:** Assessed in July 2013 **a.** Yes **b.** 1 **B0-AMET-5.Target 2:** Implement by August 2018 **c.** 1	Status - Implemented .
	6. SIGMET	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-AMET-6. Target 1:** Assessed in November 2000 **a.** Yes **b.** Yes **B0-AMET-6. Target 2:** Implemented November 2000 **c.** Yes	Implemented
	7. Other OPMET information (METAR, SPECI and/or TAF)	Number of aerodromes to be considered:1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-AMET-7. Target 1:** Assessed Nov. 2000 **a.** Yes **b.** 2 **B0-AMET-7 .Target 2:** Implemented in Nov. 2000 **c.** 1	Status – Implemented
	8. QMS for MET	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-AMET-8. Target 1:** Assessed in Dec 2013 **a.** Yes **b.** Yes **B0-AMET-8.Target 2:** Implemented Nov. 2016 **c.** Yes	Status - Implemented
DATM	**1.** Aeronautical Information Exchange Model (AIXM)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-DATM-1. Target 1:** Assessed in Nov 2017 **a.** Yes **b.** Yes **B0-DATM-1. Target 2:** Implement by March 2015 **c.** No	Status –Partially implemented Coordinated with Piarco
	2. eAIP	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-DATM-2. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** Yes **B0-DATM-2. Target 2:** Implemented in Jan 2017 **c.** Yes	Status – Implemented
	3. Digital NOTAM	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-DATM-3. Target 1:** Assess by Dec 2017 **a.** Yes **b.** Yes **B0-DATM-3. Target 2:** Implement by March 2019 **c.** No	Status - Planning
	4. eTOD	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-DATM-4. Target 1:** Assess by Dec 2017 **a.** Yes **b.** 1 **B0-DATM-4. Target 2:** Implement by June 2019 **c.** No	Status - Planning
	5. WGS-84	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-DATM-5. Target 1:** Assessed in Dec 2013 **a.** Yes **b.** Yes **B0-DATM-5. Target 2:** Implemented in Jan 2014 **c.** Yes	Status – Implemented

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	6. QMS for AIM	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-DATM-6. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** Yes **B0-DATM-6. Target 2:** Implement by Dec 2019 **a.** No	Status – Partially implemented
FICE	**1.** AIDC to provide initial flight data to adjacent ATSUs	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FICE-1. Target 1:** Assess by Dec 2019 **a.** No **b.** TBD **B0-FICE-1. Target 2:** Implement by TBD **c.** TBD	Status – Analysis Not Started
	2. AIDC to update previously coordinated flight data	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FICE-2. Target 1:** Assess by Dec 2019 **a.** No **b.** TBD **B0-FICE-2. Target 2:** Implement by TBD **c.** TBD	Status – Analysis Not Started
	3. AIDC for control transfer	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FICE-3. Target 1:** Assess by Dec 2019 **a.** No **b.** TBD **B0-FICE-3. Target 2:** Implement by TBD **c.** TBD	Status – Analysis Not Started
	4. AIDC to transfer CPDLC logon information to the Next Data Authority	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FICE-4. Target 1:** Assess by Dec 2019 **a.** No **b.** TBD **B0-FICE-4. Target 2:** Implement by TBD **c.** TBD	Status – Analysis Not Started
Performance Improvement Area 3: Optimum Capacity and Flexible Flights				
ACAS	**1.** ACAS II (TCAS version 7.1)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-ACAS-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-ACAS-1. Target 2:** Implement by TBD **c.** No	Status – N/A
	2. Auto Pilot/Flight Director (AP/FD) TCAS	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-ACAS-2. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-ACAS-2. Target 2:** **c.** N/A	Status - N/A
	3. TCAS Alert Prevention (TCAP)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-ACAS-3. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-ACAS-3. Target 2:** **c.** N/A	Status - N/A
ASEP	**1.** ATSA-AIRB	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-ASEP-1. Target 1:** Assess by Dec 2019 **a.** No **b.** TBD **B0-ASEP-1. Target 2:** Implement by TBD **c.** TBD	Status – Analysis not started

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	2. ATSA-VSA	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-ASEP-2. Target 1:** Assessed in Dec 2016 **a.** No **b.** TBD **B0-ASEP-2. Target 2:** Implement by TBD **c.** TBD	Status – Analysis not started
ASUR	**1.** ADS-B	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-ASUR-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** Yes **B0-ASUR-1. Target 2:** Implement by Dec 2019 **c.** No	Status – Planning
	2. Multilateration (MLAT)	Number of aerodromes to be considered: 2 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-ASUR-2. Target 1** Assessed in Dec 2016**:** **a.** Yes **b.** None **B0-ASUR-2. Target 2:** **c.** None	Status - N/A
FRTO	**1.** CDM incorporated into airspace planning	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FRTO-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-FRTO-1. Target 2:** **c.** N/A	Status - N/A
	2. Flexible Use of Airspace (FUA)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FRTO-2. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-FRTO-2. Target 2:** **c.** N/A	Status - N/A
	3. Flexible route systems	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FRTO-3. Target 1** Assessed in Dec 2016**:** **a.** Yes **b.** No **B0-FRTO-3. Target 2:** **c.** N/A	Status - N/A
	4. CPDLC used to request and receive re-route clearances	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-FRTO-4. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-FRTO-4. Target 2:** **c.** N/A	Status - N/A
NOPS	**1.** Sharing prediction of traffic load for next day	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-NOPS-1. Target 1:** Assessed in Sep 2017 **a.** Yes **b.** Yes **B0-NOPS-1. Target 2:** Implement by Dec 2019 **c.** No	Status – Developing
	2. Proposing alternative routings to avoid or minimize ATFM delays	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-NOPS-2. Target 1:** Assessed in Sep 2017 **a.** Yes **b.** No **B0-NOPS-2. Target 2:** **c.** N/A	Status - N/A
OPFL	**1.** ITP using ADS-B	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-OFTL-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-OFTL-1. Target 2:** **c.** N/A	Status - N/A

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
SNET	**1.** Short Term Conflict Alert (STCA)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-SNET-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-SNET-1. Target 2:** **c.** N/A	Status - N/A
	2. Area Proximity Warning (APW)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-SNET-2. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-SNET-2. Target 2:** **c.** N/A	Status - N/A
	3. Minimum Safe Altitude Warning (MSAW)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-SNET-3. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-SNET-3. Target 2:** **c.** N/A	Status - N/A
	4. Medium Term Conflict Alert (MTCA)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-SNET-4. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** No **B0-SNET-4. Target 2:** **c.** N/A	Status - N/A
Performance Improvement Area 4: Efficient Flight Paths				
CCO	**1.** Procedure changes to facilitate CCO	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-CCO-1. Target 1:** Assessed in June 2015 **a.** Yes **b.** 1 **B0-CCO-1. Target 2:** **Implement by March 2019** **c.** None	Status - Developing
	2. Route changes to facilitate CCO	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-CCO-2. Target 1:** Assessed in June 2015 **a.** Yes **b.** 1 **B0-CCO-2. Target 2:** **Implement by March 2019** **c.** None	Status - Developing
	3. PBN SIDs	Number of aerodromes to be considered: **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or1*	**B0-CCO-3. Target 1:** Assessed in June 2015 **a.** Yes **b.** 1 **B0-CCO-3. Target 2:** Implement by March 2019 **c.** None	Status – Developing
CDO	**1.** Procedure changes to facilitate CDO	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-CDO-1. Target 1:** Assessed in June 2015 **a.** Yes **b.** 1 **B0-CDO-1. Target 2:** **Implement by March 2019** **c.** None	Status - Developing
	2. Route changes to facilitate CDO	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** Have many aerodromes implemented the capability? *None or 1*	**B0-CDO-2. Target 1:** Assessed in June 2015 **a.** Yes **b.** 1 **B0-CDO-2. Target 2:** **Implement by March 2019** **c.** None	Status - Developing

Block 0 Modules	Elements	Metrics	Targets	Status & Remarks
	3. PBN STARs	Number of aerodromes to be considered: 1 **a.** Have we assessed the need? *Yes or No* **b.** How many aerodromes need this capability? *None or 1* **c.** How many aerodromes implemented the capability? *None or 1*	**B0-CDO-3. Target 1:** Assessed in June 2015 **a.** Yes **b.** 1 **B0-CDO-3. Target 2:** Implement by March 2019 **c.** 1	Status – Developing
TBO	**1.** ADS-C over oceanic and remote areas	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-TBO-1. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-TBO-1. Target 2:** **c.** N/A	Status - N/A
	2. CPDLC over continental areas	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-TBO-2. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-TBO-2. Target 2:** **c.** N/A	Status - N/A
	3. CPDLC over oceanic and remote areas	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-TBO-3. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-TBO-3. Target 2:** **c.** N/A	Status - N/A
	4. SATVOICE direct controller-pilot communication (DCPC)	**a.** Have we assessed the need? *Yes or No* **b.** Do we need this capability? *Yes or No* **c.** Have we implemented the capability? *Yes or No*	**B0-TBO-4. Target 1:** Assessed in Dec 2016 **a.** Yes **b.** None **B0-TBO-4. Target 2:** **c.** N/A	Status - N/A

Table 2.1.1: ASBU B0 Implementation Metrics and Targets

2.1.2 ASBU B0 Implementation Status Summary

The summary of ASBU B0 implementation status is provided in the Table 2.1. The details of ASBU B0 implementation status is recorded using ANRFs and provided in Appendix D.

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 1: Airport Operations									
ACDM	1. Interconnection between aircraft operator & ANSP systems to share surface operations information								1
	2. Interconnection between aircraft operator & airport operator systems to share surface operations information								1
	3. Interconnection between airport operator & ANSP systems to share surface operations information								1
	4. Interconnection between airport operator, aircraft operator & ANSP systems to share surface operations information								1
	5. Collaborative departure queue management								1
APTA	1. PBN approach procedures with vertical guidance to LNAV/VNAV minima							1	
	2. PBN approach procedures with vertical guidance to LPV minima				1				
	3. PBN approach procedures without vertical guidance to LNAV minima				1				
	4. GBAS Landing System (GLS) procedures to CAT I minima				1				

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
RSEQ	1. AMAN via controlled time of arrival to a reference fix				1				
	2. Departure management				1				
	3. Departure flow management				1				
	4. Point merge				1				
SURF	1. A-SMGCS with at least one cooperative surface surveillance system				1				
	2. Including ADS-B APT as an element of A-SMGCS				1				
	3. A-SMGCS alerting with flight identification information				1				
	4. EVS for taxi operations				1				
	5. Airport vehicles equipped with transponders				1				
WAKE	1. New PANS-ATM wake turbulence categories and separation minima								1
	2. Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart				1				
	3. Wake independent departure and arrival operations (WIDAO) for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart				1				
	4. Wake turbulence mitigation for departures (WTMD) procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart based on observed crosswinds				1				
	5. 6 wake turbulence categories and separation minima				1				
Performance Improvement Area 2: Globally Interoperable Systems and Data									
AMET	1. WAFS								1
	2. IAVW				1				
	3. TCAC forecasts								1
	4. Aerodrome warnings								1
	5. Wind shear warnings and alerts								1
	6. SIGMET								1
	7. Other OPMET information (METAR, SPECI and/or TAF)								1
	8. QMS for MET								1
DATM	1. Standardized Aeronautical Information Exchange Model (AIXM)							1	
	2. eAIP								1
	3. Digital NOTAM					1			
	4. eTOD			1					
	5. WGS-84								√
	6. QMS for AIM							1	
FICE	1. AIDC to provide initial flight data to adjacent ATSUs	1							
	2. AIDC to update previously coordinated flight data	1							
	3. AIDC for control transfer	1							
	4. AIDC to transfer CPDLC logon information to the Next Data Authority	1							
Performance Improvement Area 3: Optimum Capacity and Flexible Flights									
ACAS	1. ACAS II (TCAS version 7.1)				1				
	2. AP.FD function				√				
	3. TCAP function				√				
ASEP	1. ATSA-AIRB	1							
	2. ATSA-VSA	1							
ASUR	1. ADS-B					√			
	2. Multilateration (MLAT)				√				
FRTO	1. CDM incorporated into airspace planning							1	
	2. Flexible Use of Airspace (FUA)						1		
	3. Flexible routing						1		
	4: CPDLC used to request and receive re-route clearances				1				
NOPS	1. Sharing prediction of traffic load for next day								1
	2. Proposing alternative routings to avoid or minimize ATFM delays								1

Module	Elements	Need Analysis				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
OPFL	1. ITP using ADS-B				√				
SNET	1. Short Term Conflict Alert implementation (STCA)				√				
	2. Area Proximity Warning (APW)				√				
	3. Minimum Safe Altitude Warning (MSAW)				√				
	4. Medium Term Conflict Alert (MTCA)				√				
Performance Improvement Area 4: Efficient Flight Paths									
CCO	1. Procedure changes to facilitate CCO						1		
	2. Airspace changes to facilitate CCO						1		
	3. PBN SIDs						1		
CDO	1. Procedure changes to facilitate CDO						1		
	2. Airspace changes to facilitate CDO						1		
	3. PBN STARs						1		
TBO	1. ADS-C over oceanic and remote areas				√				
	2. CPDLC over continental areas				√				
	3. CPDLC over oceanic and remote areas				√				
	3. SATVOICE direct controller-pilot communication (DCPC)				√				

Table 2.1.2 ASBU B0 Implementation Status Summary

2.2 ASBU Block 1 Implementation Targets and Status

This section will be written after 2019. Appendix E is reserved for ASBU B1 ANRFs.

2.3 ASBU Block 2 Implementation Targets and Status

This section will be written after 2025. Appendix F is reserved for ASBU B2 ANRFs.

2.4 ASBU Block 3 Implementation Targets and Status

This section will be written after 2031. Appendix G is reserved for ASBU B3 ANRFs.

3. ICAO NACC Regional Aviation System Improvements (RASI) Status

The RPBANIP is aligned with GANP and provides guidance to States in the NACC region. The ICAO NACC RO also provides guidance to implement certain capabilities outside the ASBU scope, yet regionally important improvements. Currently 4 aerodrome associated NACC region specific improvements are identified and shown below. RASI ANRF for ICAO NACC Regional Initiatives is prepared and provided in Appendix H.

- Aerodrome certification – Status: The process towards aerodrome certification has not been completed. A timeline is still to be determined.
- Heliport operational approval – Status: Currently there is no approved or certified heliport. Approval for helicopter operations is given on a individual basis. A helipad is located at the Mount St. Johns Medical Center to assist with MEDIVAC.
- Visual aids for navigation – Status: Implemented
- Aerodrome Bird/Wildlife Organization and Control Programme – Status: Procedures are in place for the control of wildlife but not formalized in documentation. This programme is being developed and a date for implementation is to be determined.

4. Antigua and Barbuda's State Aviation System Improvements (SASI) Status

Antigua and Barbuda's State Aviation System Improvements (SASI) are broken into three categories; (1) Equipment upgrades; (2) Procedure upgrades; and (3) Infrastructure upgrades. The details of upgrades were recorded using SASI ANRFs and provided in Appendix I.

4.1 Equipment Upgrades

V. C. Bird Airport has embarked on a project to upgrade its Communication and Navigation equipment which have long past the recommended replacement dates.

A complete refurbishing of the control tower includes a completely new tower cab and modern radios and other equipment. The project is currently in the first phase and work is ongoing. A specific timeline is to be determined.

A new Doppler VOR and DME is currently being manufactured. This should be installed and operational by March of 2019. SASI ANRF for equipment upgrades is prepared and provided in Appendix I.

4.2 Procedure Upgrades

A number of procedural upgrades are currently being developed. These include new VOR Approaches, RNAV (GNSS) Approaches for both runway ends, SIDs and STARs. SASI ANRF for procedures upgrades is prepared and provided in Appendix I.

4.3 Infrastructure Upgrades

The following three infrastructure upgrades have been identified to address anticipated airport and airspace demand growth. SASI ANRF for infrastructure upgrades is prepared and provided in Appendix I.

- Airport Terminal Development – Status: A new airport terminal was built and opened for operations in August 2015 to accommodate to anticipated increase in passenger usage.
- Airport RWY Rehabilitation and ramp extension – Status: Major runway and ramp rehabilitation was carried out in 2013
- Control Tower upgrade – Status: A project to replace the current control tower cab is currently in progress. Completion date still to be determined.

5. Antigua and Barbuda State ANP Next Review Schedule

The next review and revision of this document is scheduled in January 2019.

Appendix A: ANRF Explained

An ASBU ANRF should be completed for each applicable ASBU Module as follows:

PIA The Performance Improvement Area (1, 2, 3 or 4) for the ASBU Module, as per the *NAM ASBU Handbook*.

Block - Module The Module Designation for the ASBU Module, as per the *NAM ASBU Handbook*.

Date The date when the form was completed or updated.

Module Description The Summary Description for the ASBU Module, as per the *NAM ASBU Handbook*.

Element The descriptive text for each Element, as per the *NAM ASBU Handbook*. It is not necessary to include the Defined, Derived from or Identified By information. Insert additional rows, if necessary, to accommodate all of the Elements listed for the ASBU Module.

Date Planned or Implemented The month and year when the Element was fully implemented or the year when it is planned for the Element to be fully implemented by all applicable States or at all applicable aerodromes. This field should be left blank if the Status for the Element is "Analysis Not Started" or "Not Applicable" for all States or aerodromes in the Region.

Status The Need Analysis or Implementation status for the Element, in accordance with Table NAM ASBU III-1, III-2, III-3 or III-4. Indicate the status as follows:

Not Started: if the Need Analysis has not been started for any of the States or aerodromes

In Progress: if at least one Need Analysis has been started but none have yet been completed

Need: if at least on Need Analysis has determined a requirement for the Element, but no implementation planning has yet been initiated

Not Applicable: 1) if all of the Need Analyses completed to date have concluded the Element is not required, or 2) if the Element is not an aerodrome-related improvement and the Region has not adopted the improvement for region-wide implementation.

Planning: if at least one implementation is in the Planning phase and no implementations have yet been completed.

Developing: if at least one implementation is in the Developing phase but no implementations have yet been completed.

Partially Implemented: if at least one, but not all, implementations have been completed.

Implemented: if all of Needed implementations have been completed.

Status Details Further information to support or explain the reported status. The reason(s) an Element was found to be "Not Applicable" for all the aerodromes (or States) in the Region. The reason(s) why the Need Analysis has not been completed for all or some of the aerodromes (or States) in the Region. Information on where implementation has or has not been completed (as appropriate) if the reported status is "Partially Implemented".

Achieved Benefits Describe the achieved benefits for the entire Module or particular Elements. The benefits can be quantitative or qualitative. The benefits should be described for the following 5 of the 11 Key Performance Areas (KPAs) defined the *Manual on Global Performance of the Air Navigation System* (Doc 9883):

Access & Equity: Improving the operating environment so as to ensure all airspace users have the right of access to ATM resources needed to meet their specific operational requirements; and ensuring that the shared use of the airspace for different airspace users can be achieved safely. Providing equity for all airspace users that have access to a given airspace or service. Generally, the first aircraft ready to use the ATM resources will receive priority, except where significant overall safety or system operational efficiency would accrue or national defence considerations or interests dictate by providing priority on a different basis.

Capacity: Improving the ability to meet airspace user demand at peak times and locations while minimizing restrictions on traffic flow. Responding to future growth by increasing capacity, efficiency, flexibility, and predictability while ensuring that there are no adverse impacts to safety and giving due consideration to the environment. Increasing resiliency to service disruption and minimising resulting temporary loss of capacity.

Efficiency: Improving the operational and economic cost effectiveness of gate-to-gate flight operations from the airspace users' perspective. Increasing the ability for airspace users to depart and arrive at the times they select and fly the trajectory they determine to be optimum in all phases of flight.

Environment: Contributing to the protection of the environment by minimizing or reducing noise, gaseous emissions, and other negative environmental effects in the implementation and operation of the air navigation system.

Safety: Reducing the likelihood or severity of operational safety risks associated with the provision or use of air navigation services.

Implementation Challenges A description of any circumstances that have been encountered or are foreseen that might prevent or delay implementation. Challenges should be categorized and described under the applicable subject area.

Notes Any further information as deemed appropriate.

Appendix B: ASBU ANRF Template

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	4	**Block - Module**	B0 - CDO	**Date**	April 17, 2017
Module Description: To use performance-based airspace and arrival procedures allowing an aircraft to fly its optimum profile using continuous descent operations. This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas. The application of PBN enhances CDO.					
Element Implementation Status					
1	**Element Description:** Procedure changes to facilitate CDO		**Date Planned/Implemented** Dec 15, 2013		**Status** Implemented
	Status Details Describe status.				
2	**Element Description** Route changes to facilitate CDO		**Date Planned/Implemented** Dec 15, 2013		**Status** Planning
	Status Details Describe status.				
3	**Element Description** PBN STARs		**Date Planned/Implemented** Dec 15, 2013		**Status** Developing
	Status Details Describe status.				
Achieved Benefits					
Access and Equity **Element 1:** Describe if you can, else leave it blank. **Element 3:** Describe if you can, else leave it blank.					
Capacity					
Efficiency					
Environment					
Safety					
Implementation Challenges					
Ground system Implementation					
Avionics Implementation					
Procedures Availability					
Operational Approvals					
Notes Provide notes if applicable.					

Appendix C: RASI and SASI ANRF Templates

RASI and SASI ANRF templates are the same with ASBU ANRF template with exception of the header as shown in this Appendix. The first header is for the ICAO NACC Regional Office specific improvements while the second header is for the State specific improvements.

Section C.1: Regional Aviation System Improvements (RASI) ANRF Header

Enter appropriate State Name and Date. Describe the Module (i.e., improvement group description.)

Antigua and Barbuda RASI Air Navigation Reporting Form (ANRF)		
ICAO NACC Regional Initiatives	**Date**	September 1, 2017
Module Description: ICAO NACC RO has identified airport improvements.		
Refer to the ASBU ANRF for the remaining sections (i.e., Element Implementation Status, Achieved Benefits, Implementation Challenges, and Notes)		

Section C.2: State Aviation System Improvements (RASI) ANRF Header

Enter appropriate State Name, Upgrades category (i.e., Equipment, Procedure, Infrastructure, etc.), Date. Describe the Module (i.e., Upgrades category description.)

Antigua and Barbuda SASI Air Navigation Reporting Form (ANRF)		
Infrastructure Upgrades	**Date**	September 1, 2017
Module Description: Describe module.		
Refer to the ASBU ANRF for the remaining sections (i.e., Element Implementation Status, Achieved Benefits, Implementation Challenges, and Notes)		

Appendix D: Antigua and Barbuda ASBU Block 0 ANRFs

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	1	**Block - Module**	B0 - ACDM	**Date**	November 06, 2018
Module Description: To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.					
Element Implementation Status					
1	**Element Description:** Interconnection between aircraft operator and ANSP systems to share surface operations information		**Date Planned/Implemented** November 2016		**Status** Implemented
	Status Details During the busy period i.e. during the months of December and January, Air Traffic Control communicates with the airlines any flow control information that will be implemented to streamline the flow of traffic. They are made aware that some delay will be incurred.				
2	**Element Description:** Interconnection between aircraft operator and airport operator systems to share surface operations information		**Date Planned/Implemented** **November 2016**		**Status** Implemented
	Status Details The ABAA AOC daily issues parking positions for the various airlines and shares this information with the airlines and the Air Traffic Services via e-mail. Any delays or changes are communicated as necessary.				
3	**Element Description:** Interconnection between airport operator and ANSP systems to share surface operations information		**Date Planned/Implemented** **November 2016**		**Status** Implemented
	Status Details The ABAA through it's Operations department collaborates with the Air Traffic Services whenever there are plans to conduct repair works on or near runway and ramp areas. This is done through face to face meetings and emails.				
4	**Element Description:** Interconnection between airport operator, aircraft operator and ANSP systems to share surface operations information		**Date Planned/Implemented** **November 2016**		**Status** Implemented
	Status Details These three entities collaborate on two major occasions annually; 1) during the hurricane season which runs from June to November, there are planned joint meetings to ensure timely preparation are in place in the event of pending storms that may disrupt operations and 2) during busy winter tourist season when it is anticipated that there will be an increase in airline and private flight operations, ramp parking space has to be coordinated to reduce bottleneck and conjection.				

5	**Element Description:** Collaborative departure queue management	**Date** **Planned/Implemented** **November 2016**	**Status** Implemented
	Status Details During the busy period i.e. during the months of December and January, Air Traffic Control communicates with the airlines any flow control information that will be implemented to streamline the flow of traffic. With slot times being issued the airline will coordinate their start-up and taxi times thus reducing unnecessary fuel burn on the ground.		
Achieved Benefits			
Access and Equity			
Capacity			
Efficiency – Greater efficiency in operations			
Environment			
Safety – Improves safety			
Implementation Challenges			
Ground system Implementation			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes – It must be noted that the activities of Element 5, this information is also in collaboration with the adjacent airspaces which includes the Piarco Center which controls the FIR.			

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	1	**Block - Module**	B0 - APTA	**Date**	November 6, 2018

Module Description: The use of Performance-based Navigation (PBN) and ground-based augmentation system (GBAS) landing system (GLS) procedures will enhance the reliability and predictability of approaches to runways, thus increasing safety, accessibility and efficiency. This is possible through the application of basic global navigation satellite system (GNSS), Baro-vertical navigation (VNAV), satellite-based augmentation system (SBAS) and GLS. The flexibility inherent in PBN approach design can be exploited to increase runway capacity.

Element Implementation Status

1	**Element Description:** PBN approach procedures with vertical guidance to LNAV/VNAV minima	**Date** **Planned/Implemented** April 2013	**Status** Partially Implemented
	Status Details RNAV Approaches procedures with LNAV (no VNAV) were implemented in April 2013 for RWY 07. Procedures have been developed for RWY 25 but have not yet being implemented. It is anticipated that implementation will take place in the first quarter of 2019.		
2	**Element Description:** PBN approach procedures with vertical guidance to LPV minima	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details N/A		
3	**Element Description:** PBN approach procedures without vertical guidance to LNAV minima	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details N/A		
4	**Element Description:** GBAS Landing System (GLS) procedures to CAT I minima	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details N/A		

Achieved Benefits
Access and Equity
Capacity – increases capacity
Efficiency – improves efficiency
Environment
Safety – enhances safety
Implementation Challenges
Ground system Implementation
Avionics Implementation
Procedures Availability

Operational Approvals – Delays incurred in the implementation of RWY 25 RNAV (GNSS) approaches
Notes Due to duplications in the ICAO ICARD Data Base for the naming of waypoints the implementation of the RNAV approach for RWY 25 has been delayed.

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	1	**Block - Module**	B0 - RSEQ	**Date**	November 6, 2018

Module Description: To manage arrivals and departures (including time-based metering) to and from a multi-runway aerodrome or locations with multiple dependent runways at closely proximate aerodromes, to efficiently utilize the inherent runway capacity.

Element Implementation Status

1	**Element Description:** AMAN via controlled time of arrival to a reference fix	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
2	**Element Description:** Departure management	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
3	**Element Description:** Departure flow management	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
4	**Element Description:** Point merge	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		

Achieved Benefits

Access and Equity

Capacity

Efficiency

Environment

Safety

Implementation Challenges

Ground system Implementation

Avionics Implementation

Procedures Availability

Operational Approvals

Notes

This module is not required due to a single runway operation in Antigua.

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	1	**Block - Module**	B0 - SURF	**Date**	November 6, 2018

Module Description: First levels of advanced-surface movement guidance and control systems (A-SMGCS) provides surveillance and alerting of movements of both aircraft and vehicles at the aerodrome, thus improving runway/aerodrome safety.
Automatic dependent surveillance-broadcast (ADS-B) information is used when available (ADS-B APT).
Enhanced vision systems (EVS) is used for low-visibility operations.

Element Implementation Status			
1	**Element Description:** A-SMGCS with at least one cooperative surface surveillance system	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
2	**Element Description:** ADS-B APT	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
3	**Element Description:** A-SMGCS alerting with flight identification information	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
4	**Element Description:** EVS for taxi operations	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
5	**Element Description:** Airport vehicles equipped with transponders	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		

Achieved Benefits
Access and Equity
Capacity
Efficiency
Environment
Safety
Implementation Challenges
Ground system Implementation

Avionics Implementation
Procedures Availability
Operational Approvals
Notes Not a requirement since Antigua has good weather 80% of the time.

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	1	**Block - Module**	B0 - WAKE	**Date**	November 6, 2018

Module Description: Improved throughput on departure and arrival runways through optimized wake turbulence separation minima, revised aircraft wake turbulence categories and procedures.

Element Implementation Status

1	**Element Description:** New PANS-ATM wake turbulence categories and separation minima	**Date** **Planned/Implemented** **November 2016**	**Status** Implemented
	Status Details The application of wake turbulence separation has become more necessary. Major ramp expansion and inclusion of two new taxiways significantly reduce runway occupancy times.		
2	**Element Description:** Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
3	**Element Description:** Wake independent departure and arrival operations (WIDAO) for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
4	**Element Description:** Wake turbulence mitigation for departures (WTMD) procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart based on observed crosswinds	**Date** **Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		
5	**Element Description:** 6 wake turbulence categories and separation minima	**Date** **Planned/Implemented**	**Status** N/A
	Status Details		

Achieved Benefits
Access and Equity
Capacity
Efficiency
Environment

Safety
Implementation Challenges
Ground system Implementation
Avionics Implementation
Procedures Availability
Operational Approvals
Notes Due to the configuration of the single RWY at V. C. Bird Airport, i.e. 1) displaced landing threshold, 2) departures permitted from intermediate parts of the runway and the wide range of types of aircraft (B777 to C172) utilizing the runway, the application of wake turbulence separation is necessary. In addition, landing aircraft no longer needs to backtrack to the main ramp for parking, thus runway occupancy time is reduced.

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	2	**Block - Module**	B0 - AMET	**Date**	November 6, 2018

Module Description: Global, regional and local meteorological information:

a) forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC);

b) aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including wind shear; and

c) SIGMETs to provide information on occurrence or expected occurrence of specific enroute weather phenomena which may affect the safety of aircraft operations and other operational meteorological (OPMET) information, including METAR/SPECI and TAF, to provide routine and special observations and forecasts of meteorological conditions occurring or expected to occur at the aerodrome.

This information supports flexible airspace management, improved situational awareness and collaborative decision making, and dynamically optimized flight trajectory planning.

This module includes elements which should be viewed as a subset of all available meteorological information that can be used to support enhanced operational efficiency and safety.

Element Implementation Status

1	**Element Description:** WAFS	**Date** **Planned/Implemented** November 2013	**Status** Implemented
	Status Details Updates are currently being installed.		
2	**Element Description:** IAVW	**Date** **Planned/Implemented**	**Status** N/A
	Status Details		
3	**Element Description:** TCAC forecasts	**Date** **Planned/Implemented** November 2017	**Status** Implemented
	Status Details		
4	**Element Description:** Aerodrome warnings	**Date** **Planned/Implemented** **August 2018**	**Status** Implemented
	Status Details		
5	**Element Description:** Wind shear warnings and alerts	**Date** **Planned/Implemented** **August 2018**	**Status** Implemented
	Status Details		

6	**Element Description:** SIGMET	**Date Planned/Implemented** November 2000	**Status** Implemented
	Status Details		
7	**Element Description:** Other OPMET information (METAR, SPECI and/or TAF)	**Date Planned/Implemented** **November 2000**	**Status** Implemented
	Status Details		
8	**Element Description:** QMS for MET	**Date Planned/Implemented** **November 2016**	**Status** Implemented
	Status Details Implemented but not ISO certified		
Achieved Benefits			
Access and Equity			
Capacity			
Efficiency – improves efficiency			
Environment			
Safety – enhances safety			
Implementation Challenges			
Ground system Implementation -			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes The Antigua and Barbuda MET service has made significant progress in implementing these elements.			

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	2	**Block - Module**	B0 - DATM	**Date**	November 6, 2018

Module Description: The initial introduction of digital processing and management of information, from origination to publication, through aeronautical information service (AIS)/aeronautical information management (AIM) implementation, use of aeronautical exchange model (AIXM), migration to electronic aeronautical information publication (AIP) and better quality and availability of data.

Element Implementation Status			
1	**Element Description:** Standardized Aeronautical Information Exchange Model (AIXM)	**Date Planned/Implemented** March 2015	**Status** Partially Implemented
	Status Details Areas common to the regional Notam Office are implemented however there are some areas to be implemented at the State level.		
2	**Element Description:** eAIP	**Date Planned/Implemented** January 2017	**Status** Implemented
	Status Details As of 2017 the Eastern Caribbean AIP is available digitally and is password sensitive to all the islands of the Eastern Caribbean		
3	**Element Description:** Digital NOTAM	**Date Planned/Implemented** March 2019	**Status** Planning
	Status Details Depending on TTPP		
4	**Element Description:** eTOD	**Date Planned/Implemented** June 2019	**Status** Planning
	Status Details Analysis as to the need for this element is ongoing.		
5	**Element Description:** WGS-84	**Date Planned/Implemented** January 2014	**Status** Implemented
	Status Details Enter status details		
6	**Element Description:** QMS for AIM	**Date Planned/Implemented** 2020	**Status** Partially Implemented

	Status Details This is an ongoing project which started in 2014. I was initially a joint project with the Piarco AIS which was intended to be a regional QMS. However, due to technical issues was abandoned.
Achieved Benefits	
Achieved Benefits	
Access and Equity	
Capacity	
Efficiency	
Environment	
Safety	
Implementation Challenges	
Ground system Implementation	
Avionics Implementation	
Procedures Availability	
Notes	

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	2	**Block - Module**	B0 - FICE	**Date**	November 6, 2018

Module Description: To improve coordination between air traffic service units (ATSUs) by using ATS interfacility data communication (AIDC) defined by ICAO's Manual of Air Traffic Services Data Link Applications (Doc 9694). An additional benefit is the improved efficiency of the transfer of communication in a data link environment.

Element Implementation Status

1	**Element Description:** AIDC to provide initial flight data to adjacent ATSUs	**Date** **Planned/Implemented** Enter date if applicable	**Status** Not Started
	Status Details		
2	**Element Description:** AIDC to update previously coordinated flight data	**Date** **Planned/Implemented** Enter date if applicable	**Status** Not Started
	Status Details		
3	**Element Description:** AIDC for control transfer	**Date** **Planned/Implemented** Enter date if applicable	**Status** Not Started
	Status Details Enter status details		
4	**Element Description:** AIDC to transfer CPDLC logon information to the Next Data Authority	**Date** **Planned/Implemented** Enter date if applicable	**Status** Not Started
	Status Details Enter status details		

Achieved Benefits

Access and Equity

Capacity

Efficiency

Environment

Safety

Implementation Challenges

Ground system Implementation

Avionics Implementation

Procedures Availability

Operational Approvals

Notes

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - ACAS	**Date**	November 6, 2018
Module Description: To provide short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation.					
Element Implementation Status					
1	**Element Description:** ACAS II (TCAS version 7.1)		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
2	**Element Description:** AP/FD function		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
3	**Element Description:** TCAP function		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
Achieved Benefits					
Access and Equity					
Capacity					
Efficiency					
Environment					
Safety					
Implementation Challenges					
Ground system Implementation					
Avionics Implementation					
Procedures Availability					
Operational Approvals					
Notes					

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - ASEP	**Date**	November 6, 2018

Module Description: Two air traffic situational awareness (ATSA) applications which will enhance safety and efficiency by providing pilots with the means to enhance traffic situational awareness and achieve quicker visual acquisition of targets:

a) AIRB (basic airborne situational awareness during flight operations).

b) VSA (visual separation on approach).

Element Implementation Status			
1	**Element Description:** ATSA-AIRB	**Date** **Planned/Implemented** Enter date if applicable	**Status** Not Started
	Status Details Enter status details		
2	**Element Description:** ATSA-VSA	**Date** **Planned/Implemented** Enter date if applicable	**Status** Not Started
	Status Details Enter status details		

Achieved Benefits
Access and Equity
Capacity
Efficiency
Environment
Safety
Implementation Challenges
Ground system Implementation
Avionics Implementation
Procedures Availability
Operational Approvals
Notes

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - ASUR	**Date**	November 6, 2018

Module Description: To provide initial capability for lower cost ground surveillance supported by new technologies such as ADS-B OUT and wide area multilateration (MLAT) systems. This capability will be expressed in various ATM services, e.g. traffic information, search and rescue and separation provision.

Element Implementation Status

1	**Element Description:** ADS-B	**Date Planned/Implemented** 2019	**Status** Planning
	Status Details Trinidad and Tobago is leading a regional initiative to assess the feasibility of acquisition on a regional level.		
2	**Element Description:** MLAT	**Date Planned/Implemented** None	**Status** N/A
	Status Details Enter status details		

Achieved Benefits

Access and Equity

Capacity

Efficiency

Environment

Safety

Implementation Challenges

Ground system Implementation

Avionics Implementation

Procedures Availability

Operational Approvals

Notes

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - FRTO	**Date**	November 6, 2018

Module Description: To allow the use of airspace which would otherwise be segregated (i.e. special use airspace) along with flexible routing adjusted for specific traffic patterns. This will allow greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight lengths and fuel burn.

Element Implementation Status

1	**Element Description:** CDM incorporated into airspace planning	**Date Planned/Implemented** December 2016	**Status** Partially implemented
	Status Details Enter status details		
2	**Element Description:** Flexible Use of Airspace (FUA)	**Date Planned/Implemented** **June 2014**	**Status** Developing
	Status Details Enter status details		
3	**Element Description:** Flexible routing	**Date Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details.		
4	**Element Description:** CPDLC used to request and receive re-route clearances	**Date Planned/Implemented** Enter date if applicable	**Status** N/A
	Status Details Enter status details		

Achieved Benefits

Access and Equity

Capacity

Efficiency

Environment

Safety

Implementation Challenges

Ground system Implementation

Avionics Implementation

Procedures Availability

Operational Approvals

Notes

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - NOPS	**Date**	November 6, 2018

Module Description: Air traffic flow management (ATFM) is used to manage the flow of traffic in a way that minimizes delays and maximizes the use of the entire airspace. Collaborative ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or flight information region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including a crisis caused by human or natural phenomena.

Element Implementation Status

1	**Element Description:** Sharing prediction of traffic load for next day	**Date** **Planned/Implemented** December 2016	**Status** Implemented
	Status Details Enter status details		
2	**Element Description:** Proposing alternative routings to avoid or minimize ATFM delays	**Date** **Planned/Implemented** December 2016	**Status** Implemented
	Status Details Enter status details		

Achieved Benefits

Access and Equity

Capacity

Efficiency

Environment

Safety

Implementation Challenges

Ground system Implementation

Avionics Implementation

Procedures Availability

Operational Approvals

Notes

This is a continuous process in conjunction with the neighbouring airspaces which is constantly being revised for greater efficiency.

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - OPFL	**Date**	November 6, 2018
Module Description: To enable aircraft to reach a more satisfactory flight level for flight efficiency or to avoid turbulence for safety. The main benefit of ITP is fuel/emissions savings and the uplift of greater payloads.					
Element Implementation Status					
1	**Element Description:** ITP using ADS-B		**Date** **Planned/Implemented**		**Status** N/A
	Status Details Enter status details				
Achieved Benefits					
Access and Equity					
Capacity					
Efficiency					
Environment					
Safety					
Implementation Challenges					
Ground system Implementation					
Avionics Implementation					
Procedures Availability					
Operational Approvals					
Notes					

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	3	**Block - Module**	B0 - SNET	**Date**	November 6, 2018

Module Description: To enable monitoring of flights while airborne to provide timely alerts to air traffic controllers of potential risks to flight safety. Alerts from short-term conflict alert (STCA), area proximity warnings (APW) and minimum safe altitude warnings (MSAW) are proposed. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centred.

Element Implementation Status			
1	**Element Description:** Short Term Conflict Alert (STCA)	**Date** **Planned/Implemented** NONE	**Status** N/A
	Status Details		
2	**Element Description:** Area Proximity Warning (APW)	**Date** **Planned/Implemented** **NONE**	**Status** N/A
	Status Details		
3	**Element Description:** Minimum Safe Altitude Warning (MSAW)	**Date** **Planned/Implemented** **NONE**	**Status** N/A
	Status Details		
4	**Element Description:** Medium Term Conflict Alert (MTCA)	**Date** **Planned/Implemented** **NONE**	**Status** N/A
	Status Details		

Achieved Benefits
Access and Equity
Capacity
Efficiency
Environment
Safety
Implementation Challenges
Ground system Implementation
Avionics Implementation
Procedures Availability
Operational Approvals

Notes

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	4	**Block - Module**	B0 - CCO	**Date**	November 6, 2018

Module Description: To implement continuous climb operations in conjunction with performance-based navigation (PBN) to provide opportunities to optimize throughput, improve flexibility, enable fuel-efficient climb profiles, and increase capacity at congested terminal areas. The application of PBN enhances CCO.

Element Implementation Status

1	**Element Description:** Procedure changes to facilitate CCO	**Date Planned/Implemented** June 2015	**Status** Developing
	Status Details This project commenced in June 2015 and is in the final stages of development working towards implementation in the first quarter of 2019		
2	**Element Description:** Airspace changes to facilitate CCO	**Date Planned/Implemented** **June 2015**	**Status** Developing
	Status Details This project commenced in June 2015 and is in the final stages of development working towards implementation in the first quarter of 2019.		
3	**Element Description:** PBN SIDs	**Date Planned/Implemented** **June 2015**	**Status** Developing
	Status Details This project commenced in June 2015 and is in the final stages of development working towards implementation in the first quarter of 2019		

Achieved Benefits

Access and Equity

Capacity

Efficiency

Environment

Safety

Implementation Challenges

Ground system Implementation

Avionics Implementation

Procedures Availability

Operational Approvals

Notes

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	4	**Block - Module**	B0 - CDO	**Date**	November 6, 2018
Module Description: To use performance-based airspace and arrival procedures allowing an aircraft to fly its optimum profile using continuous descent operations. This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas. The application of PBN enhances CDO.					
Element Implementation Status					
1	**Element Description:** Procedure changes to facilitate CDO		**Date Planned/Implemented** **June 2015**		**Status** Developing
	Status Details This project commenced in June 2015 and is in the final stages of development working towards implementation in the first quarter of 2019				
2	**Element Description:** Airspace changes to facilitate CDO		**Date Planned/Implemented** June 2015		**Status** Developing
	Status Details This project commenced in June 2015 and is in the final stages of development working towards implementation in the first quarter of 2019				
3	**Element Description:** PBN STARs		**Date Planned/Implemented** June 2015		**Status** Developing
	Status Details This project commenced in June 2015 and is in the final stages of development working towards implementation in the first quarter of 2019				
Achieved Benefits					
Access and Equity					
Capacity					
Efficiency					
Environment					
Safety					
Implementation Challenges					
Ground system Implementation					
Avionics Implementation					
Procedures Availability					
Operational Approvals					
Notes					

Antigua and Barbuda ASBU Air Navigation Reporting Form (ANRF)					
PIA	4	**Block - Module**	B0 - TBO	**Date**	November 6, 2018
Module Description: To implement a set of data link applications supporting surveillance and communications in air traffic services, which will lead to flexible routing, reduced separation and improved safety.					
Element Implementation Status					
1	**Element Description:** ADS-C over oceanic and remote areas		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
2	**Element Description:** CPDLC over continental areas		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
3	**Element Description:** CPDLC over oceanic and remote areas		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
4	**Element Description:** SATVOICE direct controller-pilot communication (DCPC)		**Date** **Planned/Implemented** Enter date if applicable		**Status** N/A
	Status Details Enter status details				
Achieved Benefits					
Access and Equity					
Capacity					
Efficiency					
Environment					
Safety					
Implementation Challenges					
Ground system Implementation					
Avionics Implementation					
Procedures Availability					
Operational Approvals					

Notes

Appendix E: Antigua and Barbuda ASBU Block 1 ANRFs

Insert ASBU B1 ANRFs in the future.

Appendix F: Antigua and Barbuda SBU Block 2 ANRFs

Insert ASBU B2 ANRFs in the future.

Appendix G: Antigua and Barbuda ASBU Block 3 ANRFs

Insert ASBU B3 ANRFs in the future.

Appendix H: Antigua and Barbuda RASI ANRFs

Antigua and Barbuda RASI Air Navigation Reporting Form (ANRF)			
ICAO NACC Regional Initiatives		**Date**	September 1, 2017
Module Description: ICAO NACC RO has identified airport improvements.			
Element Implementation Status			
1	**Element Description:** Aerodrome certification	**Date Planned/Implemented** Dec 2019	**Status** Developing
	Status Details ICAO NACC region has a goal to have CAR aerodromes in its regional ANP Table AOP I-1 be certified. V.C. Bird International is in the process of being certified.		
2	**Element Description:** Heliport operational approval	**Date Planned/Implemented** Sep 2017	**Status** Implemented
	Status Details ICAO NACC region has a goal to have CAR heliports in its regional ANP Table AOP I-1 certified. Currently in Antigua and Barbuda there is no approved heliport. There is a helipad located on the compound of the state hospital to assist with MEDIVAC. There is also a helipad located near the coast where sightseeing tours originate.		
3	**Element Description:** Visual aids for navigation	**Date Planned/Implemented** Sep 2017	**Status** Implemented
	Status Details ICAO NACC region has a goal to have CAR airports in its ANP Table AOP I-1 compliant with Annex 14 requirements. This capability is implemented at V. C. Bird International.		
4	**Element Description:** Aerodrome Bird/Wildlife Organization and Control Programme	**Date Planned/Implemented** Dec 2018	**Status** Developing
	Status Details ICAO NACC region has a goal to have CAR airports in its ANP Table AOP I-1 have an aerodrome bird/wildlife organization and control programme. Antigua and Barbuda is developing the manual to address this issue.		
Achieved Benefits			
Access and Equity Element 1 - Aerodrome certification: International operators may not be permitted to operate to aerodromes that are not certified Element 2. Heliport operational approval: International operators may not be permitted to operate to heliports that are not approved Element 3. Visual aids for navigation: International operators may not be permitted to operate to aerodromes that are not compliant with Annex 14			
Capacity: No report			
Efficiency Element 3. Visual aids for navigation: Annex 14 compliant visual aids for navigation assist flights to more efficiently complete ground movements			
Environment: No report			

Safety Element 1 - Aerodrome certification: Certification should be contingent upon the airport complying with applicable ICAO SARPs. Certification and the associated regulatory oversight should increase the effectiveness of SSP and SMS processes to identify and correct safety issues at certified aerodromes. Element 2. Heliport operational approval: Certification should be contingent upon the heliport complying with applicable ICAO SARPs. Approval and the associated regulatory oversight should increase the effectiveness of SSP and SMS processes to identify and correct safety issues at approved heliports. Element 3. Visual aids for navigation: Annex 14 compliant visual aids for navigation reduce flight crew confusion and assist in avoiding runway incursions or other ground movement errors. Element 4. Aerodrome Bird/Wildlife Organization and Control Programme: An effective organization and control programme reduces the potential for aircraft to strike wildlife or ingest wildlife into engines or propellers.
Implementation Challenges
Ground system Implementation: No report: No report
Avionics Implementation: No report
Procedures Availability: No report
Operational Approvals: No report
Notes Element 1: Airport Terminal Development will also address the airport terminal security issues.

Appendix I: Antigua and Barbuda SASI ANRFs

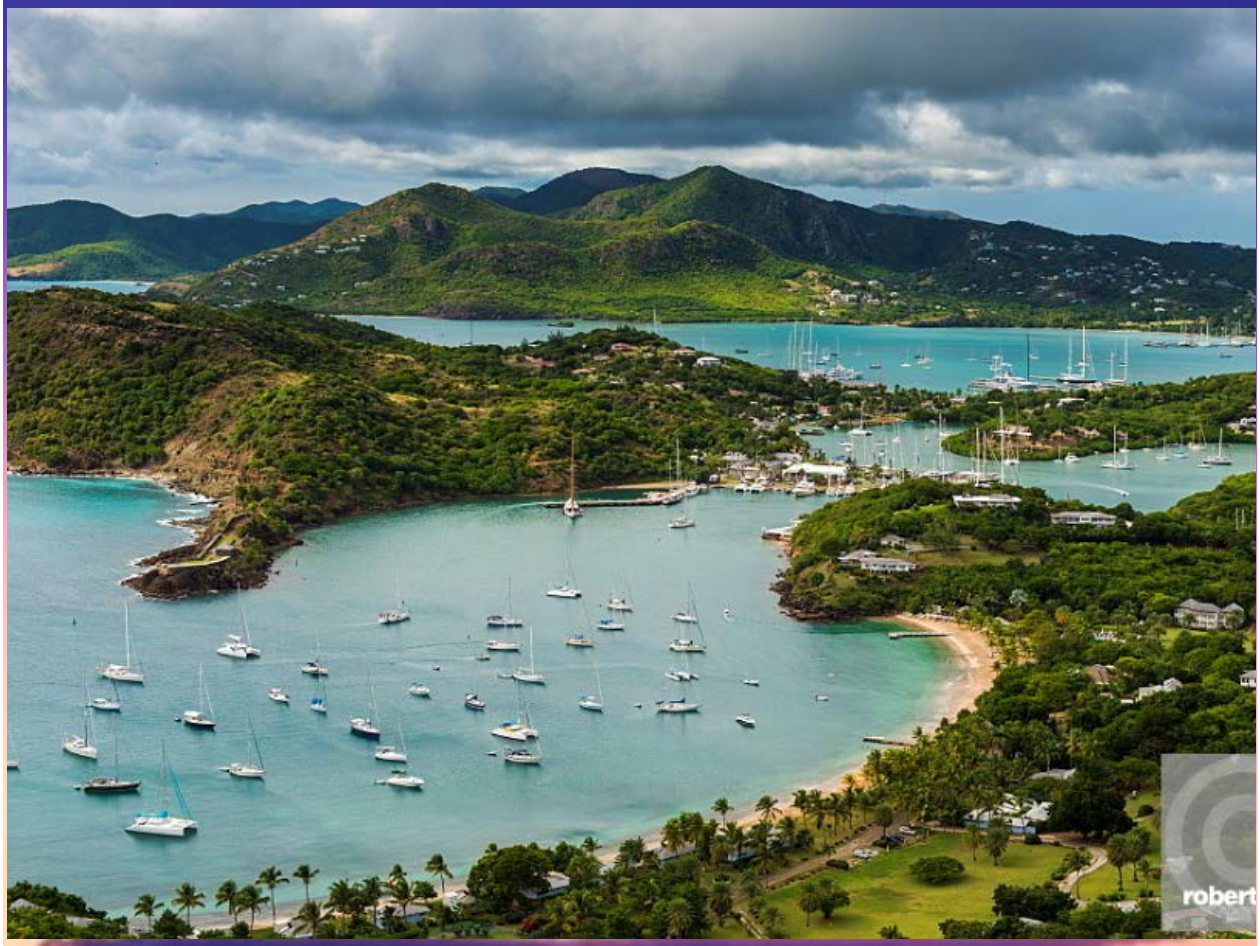
Antigua and Barbuda SASI Air Navigation Reporting Form (ANRF)			
Infrastructure Upgrades		**Date**	November 6, 2018
Module Description: Development of major components of the overall Airport to meet the demands of the growing Aviation Industry. This will improve capacity and safety in the in terminal and allow seamless maneuvering of wide body Aircraft (example B777) at the turning bay and parking on the ramp. Building of new taxiways reduced runway occupancy time and reduce surface wear and tear. A new control tower is required to comfortably accommodate staff and to install new equipment. The benefits of such infrastructure upgrades will increase an overall traffic management efficiency and enhance safety.			
Element Implementation Status			
1	**Element Description:** Airport Terminal Development	**Date Planned/Implemented** August 2015	**Status** Completed
	Status Details		
2	**Element Description:** Airport Runway Rehabilitation and Ramp Extension	**Date Planned/Implemented** **2013**	**Status** Completed
	Status Details Certain areas of the runway require improvement.		
3	**Element Description:** Control Tower Upgrades	**Date Planned/Implemented** TBD	**Status** **Developing**
	Status Details		
Achieved Benefits			
Access and Equity			
Capacity Element 1 - Airport Terminal Development: Increase the capacity to handle passengers smoothly at the peak arrival and departure periods.			
Efficiency			
Environment			
Safety Element 2 - Airport Runway Rehabilitation and ramp expansion: Improve operational safety of aircraft. Element 3 - Control Tower : Improve operational safety of aircraft and ATCOs.			
Implementation Challenges			
Ground system Implementation			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes Element 1 - Airport Terminal Development: Addresses anticipated passenger throughput.			

Antigua and Barbuda SASI ANRFs

Antigua and Barbuda SASI Air Navigation Reporting Form (ANRF)			
Equipment Upgrades		**Date**	November 6, 2018
Module Description:			
Element Implementation Status			
1	**Element Description:**	**Date Planned/Implemented** TBD	**Status** Planning
	Status Details .		
2	**Element Description:**	**Date Planned/Implemented** TBD	**Status**
	Status Details .		
3	**Element Description:** Control Tower and Technical Building Upgrades	**Date Planned/Implemented** TBD	**Status**
	Status Details		
Achieved Benefits			
Access and Equity			
Capacity			
Efficiency			
Environment			
Implementation Challenges			
Ground system Implementation			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes			

Antigua and Barbuda SASI ANRFs

Antigua and Barbuda SASI Air Navigation Reporting Form (ANRF)			
Procedures Upgrades		**Date**	November 6, 2018
Module Description: .			
Element Implementation Status			
1	**Element Description:**	**Date Planned/Implemented** TBD	**Status**
	Status Details .		
2	**Element Description:**	**Date Planned/Implemented** TBD	**Status**
	Status Details		
3	**Element Description:**	**Date Planned/Implemented** TBD	**Status**
	Status Details		
Achieved Benefits			
Access and Equity			
Capacity			
Efficiency			
Environment			
Safety			
Implementation Challenges			
Ground system Implementation			
Avionics Implementation			
Procedures Availability			
Operational Approvals			
Notes			



Air Traffic Services
Antigua & Barbuda