The Ministry of Transport and Aviation
and Department of Civil Aviation

Institutional & Organizational Analysis / Development of Guidelines & Standards

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INSTITUTIONAL & ORGANISATIONAL ANALYSIS/DEVELOPMENT OF GUIDELINES & STANDARDS: ENVIRONMENT, HEALTH & SAFETY, AND SAFETY MANAGEMENT SYSTEMS

FINAL REPORT

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Ministry of Transport and Aviation
Department of Civil Aviation

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SIGN OFF SHEET

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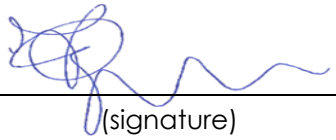
Task 2 Key Author  (signature)

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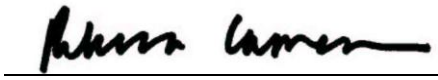
Collaboration (Environmental Guidelines) by  (signature)

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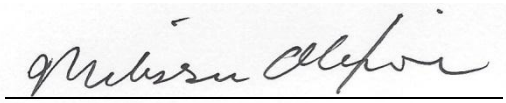
Collaboration (Environmental Analysis) by  (signature)

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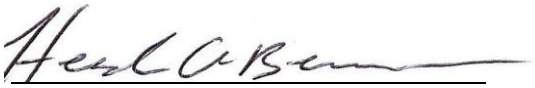
Collaboration (Airport Emergency Plans) by  (signature)

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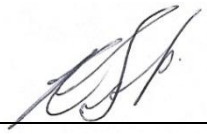
Environmental Review by  (signature)

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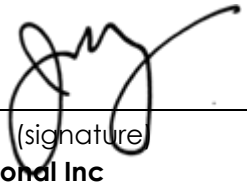
Emergency Plans Review by  (signature)

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EXECUTIVE SUMMARY

The Commonwealth of The Bahamas' Ministry of Transport and Aviation's (MOTA), Department of Civil Aviation (BCAD), has initiated a major assessment and review of the 28 government-owned and operated Family Islands Airports, as part of the significant Air Transport Institutional Reform that is currently underway. The project is contracted to Stantec Consulting International Ltd. (Stantec), and is organised in four distinct tasks:

1. Comprehensive Strategy for Optimization of the Family Islands Airports
2. Institutional & Organisational Analysis/Development of Guidelines & Standards
3. Hazardous Cargo Management Procedures
4. Energy & Water Use Conservation Standards

This report provides the results of Task 2 – Institutional & Organisational Analysis/Development of Guidelines & Standards, as they relate to:

- The environment
- Aerodrome Occupational Health & Safety (OHS) Standards
- Aerodrome safety management (Safety Management System – SMS), and
- Aerodrome Emergency Preparedness and Response (Aerodrome Emergency Plans – AEPs)

The environment. The Civil Aviation Department's current approach towards the management of environmental issues has been informal to date. The Bahamas Civil Aviation Act's Safety Regulation (BASR) added Schedule 21 in 2013 (Aerodrome Standards & Certification), which requires the issuance of an aerodrome certificate, or an amendment thereto, prescribed by "the Authority". The certificate must be accompanied by an environment impact assessment report. Schedule 21 further requires that Aerodrome developers shall follow the guidance on all aspects of the planning of aerodromes contained in the International Civil Aviation Organisation (ICAO) Airport Planning Manual (Doc 9184), Part 1 (Master Planning) and Part 2 (Land Use and Environmental Control). This ICAO reference assumes that the planning and operation of certified aerodromes adheres to all local regulations. Furthermore, ICAO Resolution A28-2: "ICAO global planning for safety and air navigation" and A38-17: "Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality, from the Resolutions Adopted at the 38th Session of the Assembly", re-emphasize the ICAO commitment to global planning for sustainability.

ICAO works with global industry and aviation organisations to develop international Standards and Recommended Practices (SARPs) which are then recommended for use by its signatory states in developing legally-binding civil aviation regulations at the national level. In 2004, ICAO adopted three major environmental goals that could be extended to aerodromes.

The ICAO environmental goals are intended to be quantified and mitigated in order to:

1. Limit or reduce the number of people affected by significant aircraft noise;
2. Limit or reduce the impact of aviation emissions on local air quality; and
3. Limit or reduce the impact of aviation greenhouse gas emissions on the global climate.

The intent by ICAO in the development of these goals is mostly targeted to Airline Companies and manufacturers to stimulate the development of quieter and cleaner burning engines and fuel. However, there is still an opportunity for the Family Islands Airports to ensure that airport planning and operations is executed to reduce possible noise and air quality issues on approach, take off and on the apron. Noise restrictions at aerodromes from aircraft operations are further referenced in Schedule 10 (Operations of Aircraft) and Schedule 17 (Mass & Balance & Performance) of the BASR.

Although the Certification framework recently established by BCAD under Schedule 21 is comprehensive and compatible with most International Best Practices (IBPs) in consideration of Environmental Protection goals, the Certification process and oversight by BCAD Inspectors for all Schedules of the BASR has not yet been implemented and the organisational structure to ensure compliance has yet to be formalized.

The Bahamas have legislation pertaining to the environment, but lack an overall regulated environmental framework. The Bahamas recognized this shortcoming and limited capacity to handle environmental matters and received funding from the Global Environment Facility for a capacity assessment (National Capacity Needs Self-Assessment, SENES Consultants Limited 2005). The results of this assessment were collated to produce the Bahamas National Environmental Management Action Plan. Since 2005, few of the recommendations have been implemented, and new legislation introduced, namely the *Subdivision and Planning Act 2010* and *Forestry Act 2010*, lack regulations for enforcement.

The following Environmental Guidelines have been developed as part of this Consultancy as they were determined to be important in allowing BCAD to demonstrate due diligence and environmental sustainability commensurate with National, ICAO, and International environmental priorities:

- Wastewater and Stormwater Management Guideline
- Natural Environment Protection Guideline
- Air Emissions and Noise Management Guideline, and
- Waste Management Guideline

Each proposed guideline has short term goals that include quantification of the issue at each aerodrome, and long term goals aimed at reducing/controlling the issue in a sustainable manner.

Key staffing requirements in support of the implementation of Environmental Management Programmes for Family Islands Airports include the designation of an Accountable Health &

Safety and Environment (HSE) Manager representing all Family Islands Airports. It is proposed that an HSE Manager position be created for Tier 1 aerodromes, and that individual Airport Managers could implement Environmental initiatives at Tier 2 aerodromes. Environmental issues at Tier 3 aerodromes would be managed through the centralized Family Islands Airports HSE Manager.

Aerodrome Occupational Health & Safety (OHS) Standards. The Civil Aviation Department's current approach towards the management of Occupational Health & Safety (OHS) practices has been informal to date. The *Health and Safety at Work Act*, Chapter 321C, of the Laws of The Bahamas generally requires that provisions have been taken to secure the health, safety and welfare of persons at work. The *Health and Safety at Work Act* further requires that provisions have been taken to protect persons other than persons at work against risks to health or safety arising out of or in connection with the activities of persons at the work location (in this case, the aerodromes); and to control the keeping and use of explosive or highly flammable or otherwise dangerous substances, and generally prevent the unlawful acquisition, possession and use of such substances. The latter requirement under the *Health and Safety at Work Act* relates to the management of hazardous substances which are further discussed in the Task 3 Report: Functional Analysis Hazardous Cargo Management Procedures.

Although the *Health and Safety at Work Act* establishes the duties of employers and employees, it was generally observed that Civil Aviation Staff were sensitive to the health and safety of their team as well as flying passengers once on aerodrome grounds. There was, however, no evidence of any formal OHS framework that would include basic items such as: an OHS policy, Management Responsibilities, Planning Processes, Risk Management, Information & Training, Incident Reporting/ Investigation/Analysis & Review, Measuring and Evaluating, or whether basic first aid materials could be found on site.

It is recommended that formal OHS Standards be developed and integrated within a Health & Safety and Environment Manual (HSEM), which would provide an integrated approach to identifying hazards, reporting incidents and accidents, and reducing and/or eliminating risks in a continuous improvement system.

Key staffing requirements in support of the implementation of OHS Programmes for Family Islands Airports include the designation of an Accountable Health & Safety and Environment (HSE) Manager representing all Family Islands Airports. It is proposed that an HSE Manager position be created for Tier 1 aerodromes, and that individual Airport Managers could implement OHS initiatives at Tier 2 aerodromes. OHS issues at Tier 3 aerodromes would be managed through the centralized Family Islands Airports HSE Manager.

Safety Management System (SMS). In 2013, The Bahamas published Schedule 21 under the BASR, Aerodrome Standards & Certification, which was further amended in 2014. Schedule 21, is further referenced in Section 1.375 of Schedule 1 – General Policies, Procedures & Definitions, which prescribes the SMS Implementation requirements of Certified Aerodromes of the Commonwealth of The Bahamas. Section 21.470 of Schedule 21 of the BASR states that for an aerodrome to receive an Aerodrome Certificate it must have an acceptable SMS in place. Further, Section

21.490 requires than an SMS be included as a fundamental element of the Aerodrome Manual. Section 21.520 spells out the expectations of an aerodrome's SMS.

The SMS will comply with the requirements set out in the BASR Schedules, primarily Schedules 19 – Accidents & Incidents Reporting and Investigation, and 21 – Aerodrome Standards & Certification, but also indirectly to a lesser extent with Schedules 1, 10, 12, 16, and 17 of the BASR. It will also comply with ICAO Annex 14 Volume 1, Aerodromes, and ICAO Document 9859, and the Safety Management Manual (now supplemented by reference to the new Annex 19). The SMS will be implemented based on resolutions detailed in Appendix J of ICAO Resolution A38-11 and have objectives and targets derived from ICAO's Global Aviation Safety Plan (GASP, 2013).

Stantec's review of the current implementation of Schedule 21 requirements confirmed that at the time of the assessment, none of the Family Islands Airports had an Aerodrome Manual nor did they have a Safety Management System (SMS Manual) in place. **Appendix C** of this report provides a generic Gap Analysis of the SMS framework as detailed by ICAO applicable to most of the 28 Family Islands Airports.

The requirement for each of the Family Islands Airports will be to implement an SMS through a phased approach recommended by ICAO, taking place over a three year period. The phases are as follows:

- Phase 1 (2014): Gap analysis, designation of an Accountable Executive, and SMS Implementation Plan Development
- Phase 2 (2015): Implementation of the Reactive Risk Management Processes (reporting and associated investigation and mitigation) and related documentation and training
- Phase 3 (2016): Implementation of the Proactive and Predictive Risk Management Processes and related documentation and training
- Phase 4 (2017): Implementation of the Operational Safety Assurance (QA/QC to meet Schedule 21 Aerodrome Manual requirements) and related documentation and training.

Key staffing requirements in support of the implementation of SMSs for Family Islands Airports include the designation of an Accountable Executive representing all Family Islands Airports as well as the designation of an SMS Manager for Tier 1 and Tier 2 Airports. The SMS Manager could be the designated Airport Manager for each aerodrome.

Aerodrome Emergency Preparedness and Response (Airport Emergency Plans – AEPs). The Task 2 report documents the current improvements needed to meeting international standards and industry best practices with respect to emergency preparedness and response for the Family Islands Airports, and provides a template document for an implementable Airport Emergency Plan (AEP). Specifically, all assessments, analyses and documentation were prepared on the basis of compliance with ICAO Annexes 14, 18 and 19, wherever reasonable and practical. The structure and methodology of the AEP template documents follows FAA Advisory Circular 150/5200-31C.

The AEPs were also developed for each aerodrome in consideration of the requirements detailed in Schedule 12 of the BASR (Air Operator Certification and Administration) where Air

Operators have a requirement to assess the level of rescue and firefighting service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the airplane intended to be used.

Based on the airport site visits and consultations, the following are the key preliminary findings and compliance gaps identified:

- Lack of site specific written plans pertaining to emergency response;
- Lack of or inadequate personnel resources;
- Lack of or inadequate Aircraft Rescue Fire Fighting (ARFF) equipment;
- Minimal fire extinguishers and/or hand caddies that are compliant (with NFPA);
- Lack of or inadequate medical aid/triage equipment and associated training; and
- A culture of acceptance to the above.

In order for BCAD to improve on its planning, a strong cultural shift within the organisation will need to begin. Changing culture can be difficult and often takes many years to see results. BCAD and NEMA have emergency plans which on paper seem adequate, inclusive of training, health and human service response and search and rescue programmes. Unfortunately, these plans do not necessarily translate in a timely and effective manner to each of the Family Islands airports.

Most airport personnel feel a sense of isolation from BCAD and NEMA in Nassau. In order to ensure future compliance with ICAO standards, it will be important for BCAD and NEMA to understand and address the disconnect that many of the Family Islands Airports personnel identify with. Training will remain a key gap to fill as a priority once the AEPs have been completed for each Airport.

Key staffing requirements in support of the implementation of AEPs for Family Islands Airports include the designation of an Accountable AEP Manager representing all Family Islands Airports. It is proposed that the Senior Firefighter for Tier 1 and Tier 2 aerodromes be responsible for the implementation of the AEP in coordination with the Airport Manager. AEP responses at Tier 3 aerodromes would be managed through a coordinated approach lead by the Island Administrator's local BCAD Representative (a position yet to be created), the local Constabulary, and the centralized Family Islands Airports AEP Manager.

Budget Opinion of Costs – Task 2. A programme budget of $1 million dollars (USD) over three years is proposed to implement the recommendations of the Task 2 Report. Activities include staffing positions, outreach and communication, training, planning, environmental base lining, and implementation support. Reduction of incidents, accidents, losses, and future financial contingent liabilities, as well as improved morale and performance will be the net results of implementing the recommendations provided in this Task Report.

1. INTRODUCTION

The Bahamas Civil Aviation Department (BCAD) operates 28 airports throughout the Family Islands. These airports range in size and function from those classified as official Ports of Entry to those having no scheduled commercial flight traffic.

Stantec Consulting International Ltd. (Stantec) was commissioned by The Bahamas Ministry of Transport and Aviation BCAD, to prepare generic Safety Management System (SMS) manuals for the Family Islands Airports, as well as develop a suite of Environmental Guidelines and OHS Standards that would apply to all of the airports in The Bahamas. A suite of site-specific Airport Emergency Plans (AEPs) for the Bahamas Family Islands Airports was also prepared. These deliverables are referred to hereafter as Task 2 of this consultancy per the scope of work below:

- Preparation of generic Safety Management System (SMS) manuals for Airports, in accordance with requirements outlined by the International Civil Aviation Organisation (ICAO);
- Development of OHS Standards, to comply with the requirements of the *Health and Safety at Work Act*, Chapter 321C, of the laws of the Commonwealth of The Bahamas;
- Preparation of Environmental Guidelines, in accordance with ICAO, to guide the design, maintenance and operation of Airports with respect to the impact on the environment caused by new construction, materials employed during construction and maintenance, possible displacement of the ecosystem, new airport zoning regulations, engine noise and emissions, and generally to ensure that all future development will be in accordance with best environmental practices required to generate the least possible adverse impact on the environment;
- Development of an Airport Emergency Plan (AEP) for each of the Family Islands Airports to comply with the FAA 150/5200-3IC - Airport Emergency Plan, as well as best international practice and the requirements of the Disaster Preparedness and Response Act of The Bahamas; and
- A Functional Analysis of the management structure of Family Islands Airports with respect to environmental concerns, health and safety and emergency preparedness planning, taking into account the culture which prevails in BCAD, the capacity of the existing personnel structure and the qualifications of staff to fulfil the Department's mission under the proposed guidelines/standards/plans.

This report provides the results of this consultancy, as well as the results of the Functional Analysis conducted related to the management structure of the Family Islands Airports.

2. SCOPE & OBJECTIVE(S)

The Commonwealth of The Bahamas and its Ministry of Transport and Aviation (MOTA) and Department of Civil Aviation (BCAD) has initiated a major assessment and review of the 28 government-owned and operated Family Islands Airports as part of the significant Air Transport Institutional Reform that is currently underway. The project is contracted to Stantec Consulting International Ltd. (Stantec), and is organised in four distinct tasks:

1. Comprehensive Strategy for Optimization of the Family Islands Airports
2. Institutional & Organisational Analysis/Development of Guidelines & Standards
3. Hazardous Cargo Management Procedures, and
4. Energy & Water Use Conservation Standards

This report provides the results of Task 2 – Institutional & Organisational Analysis/Development of Guidelines & Standards.

The aim of the deliverables under this consultancy is to support the Government in its effort to support service levels in the air transport sector according to ICAO-compliant levels. The deliverables will also assist in attracting and retaining freely competitive international and domestic airlines, thus ensuring that The Bahamas remains a competitive tourist destination, and above all, providing residents with a safe, secure and efficient air transport system to improve their accessibility.

The application of the Environmental Guidelines to existing facilities incorporates the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the Guidelines are tailored to the hazards / risks established for each site location, in which site specific variables are taken into account.

In addition to environmental protection, adherence to Guideline requirements also contributes to safeguarding the health and safety of airport employees.

2.1 SAFETY MANAGEMENT SYSTEM SCOPE

As a signatory State of the Chicago Convention, BCAD is required to establish and implement policies and programmes that comply with the suite of ICAO Aviation Safety Standards consolidated under Annex 19, which seeks to put in place the SMS at a State level (State Safety Programme – SSP) and at individual organisational levels such as aerodromes. An SMS is defined as "*a systemic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures*" [ICAO Doc. 9859].

The SMS will also comply with the requirements set out in the Bahamas Civil Aviation (Safety) Regulations (BASR) Schedules 19 and 21 (Primarily Schedules 19 – Accidents & Incidents Reporting and Investigation, and 21 – Aerodrome Certification & Operation, but also indirectly to a lesser extent with Schedules 1, 10, 12, 16, and 17 of the BASR), ICAO Annex 14 Volume 1,

Aerodromes, and ICAO Document 9859, Safety Management Manual (now supplemented by reference to the new Annex 19). The SMS will also be implemented based on resolutions detailed in Appendix J of ICAO Resolution A38-11 from the ICAO Assembly 38th Session, held in Montréal (24 September — 4 October, 2013), and have objectives and targets derived from ICAO's Global Aviation Safety Plan (GASP, 2013).

This report includes a set of generic SMS manuals that BCAD will be able to customize for all 28 airports evaluated as part of the overall consultancy. The SMS development will provide generic manuals for the management of aviation safety (Airport Safety Management System Manual) based on the three tiers of airports as described below.

The overall institutional analysis provides a review of the existing regulatory framework and the ability of BCAD personnel to execute the requirements specific to the different aspects of Task 2 in terms of capacity (number of staff and training) as well as an overall assessment of the culture that prevails. This aspect of the consultancy provides insight into the change management challenge that may lay ahead in the implementation of the recommended guidelines and systems.

2.2 HEALTH & SAFETY AND ENVIRONMENT GUIDELINES AND STANDARDS SCOPE

The scope of Task 2 includes the development of Health & Safety and Environment (HSE) Guidelines and Standards to provide practical guidance towards the design, maintenance and operation of airports with respect to the impact on the environment and Occupational Health & Safety (OHS). The guidelines will consider impacts related to new construction, materials employed during construction and maintenance, possible displacement of the ecosystem, new airport zoning regulations, engine noise and emissions, and generally to ensure that all future development will be in accordance with best HSE practices required to mitigate unacceptable impacts on the environment and human Health & Safety.

The management of OHS at airports will need to be formalized through the creation of a formal programme structure. OHS Standards related to airport employees Health & Safety which are to be integrated in the creation of an HSE Manual have been designed to comply with the requirements of the *Health and Safety at Work Act*, Chapter 321C, of the laws of the Commonwealth of The Bahamas. The standards must be generally compatible with the International Finance Corporation (IFC), World Bank Group, Environmental, Health, and Safety (EHS) Guidelines (April 2007) and international best practices recognized for management systems such as OHSAS 18001 (OHS Management Systems).

The Environmental Guidelines have been developed to be in accordance with Domestic Acts and Regulations, guidelines, and ICAO standards, where relevant, in addition to international best practices recognized for management systems such as ISO 14001 (Environmental Management Systems). The guidelines have been designed to not only cover airport operations,

but can also be applied to other activities carried out at the airports by service providers and tenants.

Schedule 21 requires that aerodrome developers shall follow the guidance on all aspects of the planning of aerodromes contained in the International Civil Aviation Organisation (ICAO) Airport Planning Manual (Doc 9184), Part 1 (Master Planning) and Part 2 (Land Use and Environmental Control). This ICAO reference assumes that all local regulations are adhered to in the planning and operation of certified aerodromes. Furthermore, ICAO Resolution A28-2: ICAO global planning for safety and air navigation and A38-17: Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality, from the Resolutions Adopted at the 38th Session of the Assembly, re-emphasize the ICAO commitment to global planning for sustainability.

The Guidelines provide general high-level recommended practices that relate to the management of activities which may pose potential risk to the environment in all phases of planning, operation, maintenance and decommissioning activities undertaken at the Family Islands Airports. It is recognized that each airport within the Family Islands is unique based on specific geography, operations and aircraft traffic, facilities, and surrounding environment. As such, each of these factors will need to be taken into consideration in the application of the HSE Guidelines and Standards to match the existing situation and culture at each airport location.

2.3 AERODROME EMERGENCY PLANS SCOPE

Aerodrome Emergency Plans (AEPs) will be delivered under separate cover to BCAD, and have not been included within the contents of this report.

The AEP report documents the current gaps to meeting international standards and industry best practices with respect to emergency preparedness and response for the Family Islands airports, and provides a template document for an implementable Airport Emergency Plan (AEP). Specifically, all assessments, analyses and documentation were prepared on the basis of compliance with ICAO Annexes 14, 18 and 19, wherever reasonable and practical. The structure and methodology of the AEP template documents follows FAA Advisory Circular 150/5200-31C.

The AEPs were also developed for each aerodrome in consideration of the requirements detailed in Schedule 12 of the BASR (Air Operator Certification and Administration) where Air Operators have a requirement to assess the level of Rescue and Firefighting Services (RFFS) protection available at any aerodrome included in the operational flight plan, in order to ensure that an acceptable level of protection is available for the airplane intended to be used. The AEPs also allow the proper reporting to be in compliance with Schedule 19 of the BASR, Accident & Incident Reporting & Investigation.

3. COMPANION DOCUMENTS

This Functional Analysis report is one of a series of documents that have been developed for The Bahamas Ministry of Transport and Aviation, Department of Civil Aviation. The two deliverables included under this Task 2 report are:

- Safety Management System for Family Islands Airports in The Bahamas, and
- Health & Safety and Environment (HSE) Guidelines and Standards for Airports in The Bahamas

Companion documents presented under separate cover include:

- Technical Analysis and Economic Analysis (Task 1),
- Airport Emergency Plans (AEPs) (sub-set of Task 2),
- Hazardous Cargo Management (Task 3), and
- Energy and Water Strategy for Airports (Task 4).

While this report may be reviewed in isolation, it is recommended that readers familiarize themselves with all documents to ensure a comprehensive understanding of the institutional reform that is being proposed as part of this consultancy.

4. APPROACH TO COMPLETING THIS ASSIGNMENT

Similarly to the other companion documents prepared for the Bahamas Family Islands Airports under this consultancy, the analysis undertaken to produce this report and associated Appendices was completed through primary and secondary research. Primary research was performed with the involvement of management and staff at all levels of the Ministry of Transportation and Aviation, Civil Aviation Department, as well as the Ministry of Tourism. Other government Agencies and Commissions involved include the Bahamas Environment, Science and Technology (BEST) Commission and The Bahamas' National Emergency Management Agency (NEMA). Primary research included a review of 28 airport facilities to document the current state of Safety Management Systems and associated practices, as well as the current state of practices related to Health & Safety and Environment (HSE) management. Through workshops and email correspondence, an understanding of the current institutional framework was developed. Secondary research included Internet searches and document reviews of environmental management activities in The Bahamas.

Within the Family Islands, a total of 28 airports are currently being operated by The Bahamas Civil Aviation Department. The functions and operations of these airports vary, based on the volume of flight and passenger traffic and the facilities present at each airport (including terminal, emergency and fire response facilities, maintenance facilities, etc.).

In order to effectively optimize and focus the allocation of resources towards the improvement of safety management, as well as environmental and OHS practices at each airport location, a tiered approach to the application of SMS and HSE Guidelines is proposed, based on the grouping of the Family Islands Airports into the three tiers used consistently throughout all tasks associated with the Optimization Assessment Report (refer to Table 1 below). These are:

- Tier 1 – airports are significant Port of Entry gateways for the Family Islands and have economic opportunity to be operationally sustainable.
- Tier 2 – airports have Port of Entry status and provide Customs and immigration services to Family Islands where there is existing international traffic and/or economic development to support limited or shared services.
- Tier 3 – airports have domestic services only and limited traffic (or are transitional airports) that require local coordination with Island Administrators for daily inspections and maintenance.

Table 1: Division of Family Islands Airports into Tier Structure

Tier 1	Tier 2	Tier 3
Marsh Harbour	Great Harbour Cay	Mayaguana
Exuma International	San Andros International	Rum Cay
San Salvador International	Andros Town	Sandy Point
North Eleuthera International	New Bight	Mores Island
South Bimini	Rock Sound	Mangrove Cay
Governor's Harbour	Matthew Town	Congo Town
	Deadman's Cay	Staniel Cay
		Black Point
		Farmer's Cay
		Stella Maris
		Crooked Island
		Spring Point
		Ragged Island
		Treasure Cay
		Arthur's Town

Note: *Concurrent to the development of these SMS and HSE Guidelines, an Optimization Study is underway which may recommend divestiture of certain airports from the portfolio of the Civil Aviation Department. This Report and associated guidelines have been written to address current status, being that ownership and operation of each of the Family Islands Airports currently falls to the Civil Aviation Department. Listing of airports into each "Tier" must be revisited should ownership or scope of operations of these airports change.*

Using the ranking noted in Table 1, the implementation of SMS and HSE Guidelines and Standards will focus on Tier 1 and Tier 2 airports as the priority facilities for implementation of Guideline practices in the short term. Based on the interpretation of Schedule 21 (Aerodrome Standards & Certification) of the Bahamas Civil Aviation (Safety) Regulation (BASR), it is possible that Tier 3 aerodromes would not necessarily be required to be "certified"; however, an "equivalent level of safety" would be defined and appropriate standards and guidelines will apply in the spirit only of the ICAO Annexes. The Task 1 report proposes a "Registration" process for all airports in the Commonwealth of The Bahamas. This would be referenced in the BASR Schedules and establish the requirements to follow specific standards and guidelines.

Once projects are identified and underway in Tier 1 and Tier 2 aerodromes, communication of the results and subsequent extension to Tier 3 airports should also be considered as a key area of activity.

5. ASSESSMENT OF CURRENT SITUATION – SAFETY MANAGEMENT SYSTEMS (SMS)

The *Bahamas Civil Aviation (Safety) Regulations* (BASR), 2001, promulgated under the *Bahamas Civil Aviation Act*, provides regulatory requirements for safety that affect aircraft and associated operational personnel (including maintenance personnel). The current edition of the BASR does not explicitly specify safety management system requirements, nor does it require the adoption of standards for aerodromes. The BASR does refer to "*Applicable laws*" that include the provisions of the Convention on International Civil Aviation signed at Chicago on the 7th of December 1944 ("the Chicago Convention") and the Annexes thereto together with the Standards and Recommended Practices (SARPs) established by ICAO thereunder and such other internationally recognized standards and practices (to be adopted and applied as appropriate in The Bahamas). Under the current edition of the BASR, Schedule 1 – General Policies, Procedures & Definitions, BCAD is identified as "the Authority" for all matters relating to the application of the Schedules. Section 1.375 imposes the need for an SMS for aerodromes certified under Schedule 21, and Section 1.380 of Schedule 1 provides the general details of the framework to be implemented. At a minimum, the SMS needs to include:

1. A process to identify actual and potential safety hazards and assess the associated risks;
2. A process to develop and implement remedial action necessary to maintain an acceptable level of safety; and
3. Provision for continuous monitoring and regular assessment of the appropriateness and effectiveness of safety management activities

Amendments to the BASR have been published since the 2001 gazette publication. These include an amended version in 2010 where the changes in BASR 2010 were necessary to bring The Bahamas regulation in compliance to the applicable ICAO Annex 1, 6, 7, 8, 13 and 18. As a result of these revisions, a number of changes were made to the BASR. The draft Regulations were made available online through the Bahamas Government website from December 2009 to March 2010 for commenting by the aviation community. On October 15th 2010, the Civil Aviation (Safety) (Amendment) Regulations 2010 (BASR 2010) was gazetted and superseded the Civil Aviation Safety Regulations (2001). The revised regulations became available to the aviation public in February 2011. Further to this publication, an Advisory Circular (AC 01-001 dated September 4, 2012) was released to provide the specific references for the changes made to the Bahamas Civil Aviation (Amendment) (Safety) Regulations 2012 to all aircraft owners and operators, all airmen, and all maintenance organisations and training organisations. These changes did not bring into application any Schedule of the BASR beyond Schedule 20.

In December 2013, The Bahamas published a revised Schedule 21 under the BASR. Schedule 21 prescribes the requirements of the Commonwealth of The Bahamas for certification of aerodromes and the operations and operators of these aerodromes. The certification and operating requirements described in this Schedule reflect the Standards and Recommended Practices of:

- ICAO Annex 14, Volume 1, Aerodromes;
- ICAO Document 9774, Manual on Certification of Aerodromes; and
- BCAD Advisory Circular AC-00-003, Preparation of an Acceptable Safety Management System (March 2010).

5.1 CERTIFIED AERODROME SMS REQUIREMENTS

Section 21.587 of Schedule 21 of the BASR Provides details for the SMS requirements of certified aerodromes. This includes the requirement that aerodrome operator shall:

(1) In order to obtain an aerodrome certificate, establish a Safety Management System (SMS) for the aerodrome describing the structure of the organisation and the duties, powers and responsibilities of the officials in the organisational structure with a view to ensuring that operations are carried out in a demonstrably controlled way and are improved where necessary;

(2) Require all the users of the aerodrome, including fixed-base operators and those performing activities independently at the aerodrome in relation to flight or aircraft handling, to comply with the requirements of the aerodrome operator with regard to safety and order at the aerodrome and shall monitor such compliance;

(3) The aerodrome's SMS strategy and planning shall include—

(i) Safety performance targets;

(ii) Priorities for implementing safety initiatives;

(iii) A framework for controlling safety risks to a level as low as reasonably practicable having regard to the requirements of the Standards and Recommended Practices in ICAO Annex 14 Volume 1 and applicable regulations, standards, or other guidance material; and

(iv) Methods for promulgating information and ensuring competence within the SMS.

(4) Oblige all the users of the aerodrome, including fixed-base operators and organisations referred to in paragraph (2), to cooperate in the programme to promote safety and order at, and the safe use of, the aerodrome by immediately informing it of the accidents, incidents, defects and faults which have a bearing on safety.

The SMS will comply with the requirements set out in the BASR Schedules (Primarily Schedules 19 – Accidents & Incidents Reporting and Investigation, and 21 – Aerodrome Certification & Operation, but also indirectly to a lesser extent with Schedules 1, 10, 12, 16, and 17 of the BASR), ICAO Annex 14 Volume 1, Aerodromes, and ICAO Document 9859, Safety Management Manual (now supplemented by reference to the new Annex 19). The SMS will also be implemented based on resolutions detailed in Appendix J of ICAO Resolution A38-11 and have objectives and targets derived from ICAO's Global Aviation Safety Plan (GASP, 2013). As a minimum, the SMS needs to:

- Identify safety hazards;
- Ensure that remedial action necessary to maintain an acceptable level of safety is implemented;
- Provide for continuous monitoring and regular assessment of the safety level achieved; and
- Aim to make continuous improvement to the overall level of safety.

Appendix 7 of ICAO's Accident/Incident Reporting Manual (ADREP Manual Doc 9156) identifies the types of aircraft incidents of main interest to ICAO. In terms of aerodrome operations, the following type of incident would need to be included in the aerodrome hazard identification system for mitigation in the SMS:

- Terrain and Obstacle Clearance Incident;
- Take-off and Landing Incidents; and
- Near Collision and other Air Traffic Incidents (ground-based for aerodromes)

Section 21.520 of Schedule 21 of the BASR (Aerodrome Operator's Safety Management System) contains the expectations of an aerodrome's SMS and provides specifics as they relate to roles and responsibility of the SMS Manager, as well as of the Accountable Executive. ICAO defines the Accountable Executive as: "A single, identifiable person having responsibility for the effective and efficient performance of the State's SSP or of the service provider's SMS". The Accountable Executive must have:

- Full authority for human resources issues;
- Authority for major financial issues;
- Direct responsibility for the conduct of the organisation's affairs;
- Final authority over operations under certificate; and
- Final responsibility for all safety issues.

The recently completed State Safety Programme (SSP) for the Bahamas Civil Aviation Department (2011) establishes the following Strategic Objectives for aviation safety:

- BCAD regulates the safety of Bahamas aviation by approving and overseeing the organisations and individuals involved in aviation that falls within its remit;
- BCAD will continue to develop and utilize a risk-based approach to ensure that Bahamas aviation complies with international legislation and requirements;
- BCAD will work collaboratively with Bahamas aviation industry to continuously improve aviation safety and address safety issues;
- Where required, BCAD will take any necessary actions to ensure safety is not compromised and will ensure that the high safety standards within Bahamas airspace, and its supporting infrastructure, are maintained, with potential risks identified and appropriate mitigating actions taken;
- BCAD will draw upon worldwide and Bahamas data to identify safety trends applicable to Bahamas aviation, prioritizing this information to focus on the most significant safety issues; and
- The resulting safety improvement initiatives will be included in the BCAD Safety Plan, which will be issued every year and used as a means of monitoring progress and effectiveness.

Key staffing requirements in support of the implementation of SMSs for Family Islands Airports therefore include the designation of an Accountable Executive representing all Family Islands Airports as well as the designation of an SMS Manager for Tier 1 and Tier 2 Airports. The SMS

Manager could be the designated Airport Manager for each aerodrome. They will be critical in the implementation of the SMS Plan.

Stantec's review of the current implementation of Schedule 21 requirements confirmed that at the time of the assessment, none of the Family Islands Airports had an Airport Operations Manual nor did they have a Safety Management System (SMS) in place. A Gap Analysis based on the guidance provided by ICAO in Appendix 7 to Chapter 5 of ICAO Doc 9859 AN/474 Safety Management Manual (SMM) is provided in **Appendix C** of this report. None of the required elements of an SMS were fully observed at the time of the site visits.

5.2 PROPOSED SMS IMPLEMENTATION PLAN

The requirement for each of the Family Islands Airports will be to implement an SMS through a phased approach as recommended by ICAO. The implementation should be overseen by the Safety & Regulations Inspectorate (SRI), SSP and SMS Section, as identified in the Civil Aviation SSP. The three-year phased approach was also incorporated in the Canadian Civil Aviation Regulations and shown to allow for the change management to proceed in a step-wise approach. The phases and proposed timelines are as follows:

- Phase 1 (2014): Gap analysis (refer to **Appendix C**), designation of an Accountable Executive, and SMS Implementation Plan Development (Phase 1 Timeline: one to six months depending on the complexity of the organisation – plan to complete by 31 Dec 2014).
- Phase 2 (2015): Implementation of the Reactive Risk Management Processes (reporting and associated investigation and mitigation) and related documentation and training (Phase 2 Timeline: eight months to one year depending on the complexity of the organisation – plan to complete by 31 Dec 2015).
- Phase 3 (2016): Implementation of the Proactive and Predictive Risk Management Processes and related documentation and training (Phase 3 Timeline: eight months to one year depending on the complexity of the organisation – plan to complete by 31 Dec 2016).
- Phase 4 (2017): Implementation of the Operational Safety Assurance (QA/QC to meet Schedule 21 Aerodrome Manual requirements) and related documentation and training (Phase 4 Timeline: eight months to one year depending on the complexity of the organisation – plan to complete by 31 Dec 2017).

Three requirements should be completed prior to developing the SMS implementation Plan:

1. Identify the Accountable Executive and the safety accountabilities of managers;
2. Identify the person (or planning group) within the organisation responsible for developing the SMS implementation plan; and
3. Identify the SMS Manager for Tier 1 and 2 aerodromes that will be responsible for the implementation of the SMS at their aerodrome.

The success of the proposed SMS implementation plan depends on the support, commitment and participation of management, supervisors and line operational workers.

5.2.1 Phase 1- Safety Policy and Objectives (Planning)

Phase 1 of the SMS Implementation Plan should be the blueprint on how the SMS requirements will be met and integrated to the organisation's work activities. In order to achieve that, the following tasks should be completed:

1. Management commitment to SMS implementation:
    - Identify the safety objectives of the organisation:
        - Objectives are precise tangible elements to be validated (through the different phases) and linked to the safety performance indicators and safety performance targets (ensure compatibility with those of the Civil Aviation SSP).
    - Develop a safety policy that contains at least addressed the following points:
        - Achieve the highest safety standards and a commitment to make the maintenance of safety the highest priority;
        - Observe all applicable legal requirements and international standards, and best effective practices;
        - Ensuring that all aspects of operations meet the safety performance targets.
        - Provide appropriate human and financial resources;
        - Enforce safety as one primary responsibility of all managers;
        - Ensure that the policy is understood, implemented and maintained at all levels of the organisation.

Note: the Policy Statement below was taken from the BCAD SSP (2011)

Bahamas Civil Aviation Department (BCAD) Safety Policy Statement

1. *The management of civil aviation safety in the Bahamas is one of the major responsibilities of SCAD who is committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure that all aviation activities that take place under its oversight will achieve the highest level of safety performance, while meeting both national and international standards.*
2. *According to this major responsibility the holders of BCAD aviation certificates shall be required to demonstrate that their management systems adequately reflect an SMS approach. The expected result of this approach is an improved safety management and safety practices, including safety reporting within the world civil aviation industry.*
3. *In the Bahamas, all levels of aviation management are accountable for the delivery of the highest level of safety performance within the State, starting with the Director of the Bahamas Civil Aviation Department (BCAD) who is the Accountable Executive of the SSP.*
4. *The Bahamas Civil Aviation Department (BCAD) commitment is to:*

a. *Develop general rulemaking and specific operational policies that build upon safety management principles, based on a comprehensive analysis of the Bahamas aviation system;*

b. *Consult with all segments of the aviation industry on issues regarding regulatory development and Acceptable Level of Safety (ALoS) for service providers;*

c. *Support the management of safety in the Bahamas through an effective safety reporting and communication system;*

d. *Interact effectively with service providers in the resolution of safety concerns;*

e. *Ensure that within the BCAD, sufficient resources are allocated and personnel have the proper skills and are trained for discharging their responsibilities, both safety related and otherwise;*

f. *Conduct both performance-based and compliance-oriented oversight activities, supported by analyses and prioritized resource allocation based on safety risks;*

g. *Comply with and, wherever possible, exceed international safety requirements and standards;*

h. *Promote and educate the aviation industry on safety management concepts and principles;*

i. *Oversee the implementation of service provider's SMS in the Bahamas;*

j. *Ensure that all activities under oversight achieve the highest safety standards;*

k. *Establish provisions for the protection of Safety Data, Collection and Processing Systems (SDCPS), so that the Bahamas aviation community complies with the Mandatory Reporting Occurrences (MOR) and is encouraged to provide voluntarily essential safety-related information on hazards according to the Voluntary Reporting System (VRS) implemented at SCAD;*

l. *Establish a continuous flow and exchange of safety management data between SCAD and Bahamas service providers;*

m. *Establish and measure the realistic implementation of SCAD SSP against safety indicators and safety targets which are clearly identified; and*

n. *Promulgate an enforcement policy that ensures that no information derived from any Safety Data, Collection and Processing Systems (SDCPS) established under the SSP or the SMS will be used as the basis for enforcement action, except in the case of gross negligence or wilful deviation.*

This policy must be understood, implemented and observed by all staff involved in activities related to the Bahamas Civil Aviation Department (BCAD).

2. Management must establish the level of expectation for the SMS and its usage by contractors and sub-contractors on their jobsites:
    - Write SMS requirements into the contracting process;
    - Establish the SMS requirements in the bidding documentation.

3. Safety communication:
    - Communicate, with visible endorsement, the safety policy to all staff;
    - Establish means to communicate safety related issues that could include:
        - Safety policies and procedures;
        - Newsletters;
        - Bulletins; and
        - Website.

4. Perform Gap Analysis against the four components and thirteen elements of the SMS framework as specified below (refer to **Appendix C** of this report).
5. Identify potential challenges in the implementation and develop plans to address challenges (i.e. risk assessment of the plan):
    - With the results of the gap analysis, the implementation team should develop an SMS structure and determine the safety responsibilities of key personnel.

6. Establishment of SMS Organisational Structure:
    - The implementation planning team to propose an SMS structure; and,
    - Safety responsibilities of key personnel (recommendations below):
        - The Accountable Executive (responsibilities detailed in the Civil Aviation SSP);
        - The safety office – *Corporate functions at BCAD*:
            - Advising senior management on safety matters;
            - Assisting line managers;
            - Overseeing hazard identification systems; and
            - Implementation of a Safety Review Board (SRB) as a high level committee with strategic safety functions.
        - The Safety Manager – *Responsibilities*:
            - Responsible individual and focal point for the development and maintenance of an effective safety management system.

7. Approval of the SMS implementation plan and initial training:
    - Develop a draft SMS implementation plan;
    - Identify the costs associated to training and planning of the implementation;
    - Draft budget for SMS implementation;
    - Approve initial budget for SMS implementation plan; and

- SMS implementation plan signed by the Accountable Executive.

8. Training:
    - Introduce SMS concepts accordingly to the level of all workers, contractors and sub-contractors;
    - Identify who needs to be trained for further phases;
    - Identify the costs associated to training;
    - Organise and set up schedules for training of all supervisors and workers.

9. Coordination of the emergency response plan:
    - Internal coordination:
        - Emergency planning team established;
        - Emergency planning coordinator appointed; and
        - Refer to Aerodrome Emergency Plan (AEP) Sub-Task report for details.
    - External coordination:
        - Established with search and rescue services; and
        - Established with BCAD and FEMA.

10. Documentation:
    - Develop the safety library of the organisation;
    - Development of SMSM (related to planning phase);
    - Safety library in place; and
    - Information on Phase 1 collected and distributed to the organisation.

Phase 1 Deliverables:

- Safety objectives of the organisation approved by the Accountable Executive;
- Safety Policy signed by the Accountable Executive;
- Safety Policy distributed all across the organisation;
- SMS organisational structure in place;
- Lines of safety accountability established;
- Approval of SMS implementation plan and initial training; and
- Emergency response planning in place.

Phase 1 Milestones:

- Draft proposal of safety policy;
- Gap Analysis results delivered;
- Proposal of SMS organisational structure including allocation of resources and time for the SMS processes among the different management layers of the organisation; and
- Estimated budget for SMS processes.

5.2.2 Phase 2: Safety Risk Management (reactive processes)

The focus of Phase 2 of the SMS implementation is formalizing the means of collecting, recording, acting on and generating feedback about hazards and risks in operations. The following are the key tasks to plan for:

1. Determine what form of intervention tool to be used to collect reactive information.
2. Decide which reporting system will be required and adapted to the organisation:
    - Mandatory reporting system;
    - Voluntary reporting system; or
    - Confidential reporting system.
3. Determine what Matrix will be used (refer to Section 7 of this report – Identification of Aspects and Hazards as well as generic SMS in **Appendix A**):
    - Customize the Risk Matrix to suit the organisational complexity; and
    - Develop Risk Matrix instructions on the forms and/or in the training.
4. Determine risk management levels to be documented (i.e. intolerable, tolerable or acceptable).
5. Identify administration process/responsibilities for implementing strategies:
    - Will we need a database to capture reactive data from forms?
    - Who will maintain filing/database?
    - Who will analyse data for trends?
    - How will trends be communicated to?
    - Develop control and mitigation strategies (for reactive processes).
6. Build the safety library.
7. Collect information for safety performance indicators.
8. Train the Supervisors.
9. Train the front line personnel.
10. Provide ongoing coaching and guidance by supervisors to front line personnel.

Phase 2 Deliverables:

- Safety reporting system (for reactive processes) in place; and
- Safety library in place.

Phase 2 Milestones:

- Risk assessment matrix in place for reactive processes;
- Formal procedure to translate operational safety data into hazard-related information;
- Training on reactive processes completed for operational personnel and managers and supervisors; and

- Convey safety critical information to the organisation based on reactive processes.

5.2.3 Phase 3: Safety Risk Management (proactive and predictive processes)

1. Determine what form of intervention tool to be used to collect proactive and predictive information (e.g., confidential reporting systems, normal operations monitoring etc.).
2. Update guidelines, procedures, to support the proactive and predictive intervention tools.
3. Review and update the reporting policy.
4. Identify administration process/responsibilities:
   - Will we need a database to capture proactive and predictive data from forms?
   - Who will maintain filing/database?
   - Who will analyse data for trends?
   - How will trends be communicated and to whom?
5. Train flight safety manager on specific intervention tools on collecting information.
6. Determine risk management levels to be documented (as in Phase 2)
7. Use the risk matrix as in Phase 2.
8. Develop control and mitigation strategies.
9. Brief supervisors and frontline personnel on proactive and predictive processes.
10. Develop safety performance indicators and targets.

Phase 3 Deliverables:

- Safety reporting system (for proactive and predictive processes) in place; and
- Safety performance indicators and targets approved by Director.

Phase 3 Milestones:

- Risk control/mitigation strategies developed;
- Safety performance indicators and targets reviewed by the Safety Office or equivalent;
- Training on proactive and predictive processes completed for operational personnel, managers and supervisors; and
- Convey safety critical information to the organisation based on reactive processes.

5.2.4 Phase 4: Operational Safety Assurance and Safety Promotion

Acceptable levels of safety

1. Define safety performance indicators and safety performance targets of an acceptable level(s) of safety of the organisation;

2. Establish safety requirements to deliver the safety performance indicators and safety performance targets of an acceptable level of safety; and
3. Acceptable levels of safety established and submitted to BCAD.

Safety performance monitoring and measurement (consider Global Aviation Safety Plan – GASP – initiatives)

4. Define the process by which the safety performance of the organisation is verified in comparison to the approved safety policies and objectives:
    - Safety reporting;
    - Safety studies;
    - Safety reviews;
    - Audits;
    - Surveys;
    - Internal safety investigations for occurrences or events that are not required to be investigated or reported to BCAD;
    - Define safety performance indicators and safety performance targets of an acceptable level(s) of safety of the organisation;
    - Establish safety requirements to deliver the safety performance indicators and safety performance targets of an acceptable level of safety; and
    - Establish lines of accountability for measures of reliability, availability and/or accuracy related to safety requirements.

Management of change

5. Assess internal and external changes:
    - Identify affected established processes and services; and
    - Arrangements to ensure safety performance.

SMS continuous improvement

- Proactive evaluation of facilities, equipment, documentation and procedures completed through audits and surveys;
- Proactive evaluation of the individuals' performance completed to verify the fulfilment of their safety responsibilities;
- Procedures for Reactive evaluations in place to verify the effectiveness of the system for control and mitigation of risks (accidents, incidents and major events investigations);
- Training relevant to operational safety assurance; and
- Documentation relevant to operational safety assurance.

6. Identify changes required from trend analysis of Risks being reported:
    - Safe Work Practices being updated; and
    - Additions to the Safety Programme.

Safety Promotion

7. Effective methods to promote safety in this phase should include among others:

- Review, revise and communicate changes to your organisation's SMS usage and standards;
- Share "lessons learned" that promote improvement of the SMS;
- Identify methods to communicate successes of SMS (i.e. after training is completed, trends identified in the documentation submitted, changes to the safety related programmes, etc.);
- Review safety policy including the reporting policy; and
- Promote participation by all personnel in the identification of hazards.

Phase 4 Deliverables:

- Acceptable levels of Safety established and submitted to BCAD;
- Schedule 21 Compliance programme (internal)established; and
- Revised Safety strategies and processes approved by the Accountable Executive.

Phase 4 Milestones:

- Processes for safety performance monitoring and measurement approved and established;
- Re-evaluate strategies and processes by the BCAD "Safety Office"; and
- Training on proactive and safety assurance completed for operational personnel, managers and supervisors.

5.3 CERTIFICATION EXEMPTION

Schedule 21 requirements form the basis for a judgment on the suitability of the aerodrome to be licensed and operated, taking into account the scale and scope of the flying activity which is to take place there. To this effect, Section 21.001 of Schedule 21 considers that Aerodromes may be exempt from the requirement for certification if (1) The Minister has written an exemption; and (2) An equivalent level of safety is defined. Stantec proposes that a formal "Registration" process be established by reference in the BASR Schedules as detailed in the Task 1 Report of this consultancy.

It is proposed that Tier 3 aerodromes be exempt from certification; however, they would still be registered under a new proposed registration process, and as such, they would also have an SMS that would not necessarily fully comply with ICAO requirements. Although an SMS for Tier 3 aerodromes is presented, it is designed to allow the establishment of a system to preserve the level of safety "defined" and accepted by BCAD in their safe management of the Tier 3 aerodromes.

Implementation of the SMS for Tier 3 aerodromes will be significantly different from the process outlined above for the Tier 1 and Tier 2 aerodromes. In the absence of a full time organisation at the airfield with limited air traffic and no scheduled flights, the safety oversight function will be coordinated by the Safety Office at BCAD with the collaboration of on-site personnel residing on

the Island where the aerodrome is located and in coordination with the Island Administrator. As resolved in ICAO Resolution A38-5 (Appendix J), runway safety will always be given a high priority in the establishment of any SMS.

6. ASSESSMENT OF CURRENT SITUATION – ENVIRONMENTAL MANAGEMENT AND OCCUPATIONAL HEALTH & SAFETY

In order to assess current practices in environment and Occupational Health & Safety (OHS) management within The Bahamas as it relates to the operation of aerodromes, a documentation and organisational review was completed to assess the extent of regulatory requirements and management standards/guidelines applicable to the Family Islands Airports. The following sections present an overview of current practices in OHS as well as environmental management observed at Family Islands Airports.

The regulatory framework that exists in The Bahamas is detailed, as well as expectations from ICAO standards and recommended practices (SARPs). Where appropriate, international best practices are also outlined where these could be used as models to adopt for the Family Islands Airports.

6.1 CURRENT PRACTICES IN OCCUPATIONAL HEALTH & SAFETY (OHS)

The following provide a summary of The Bahamas OHS framework that was considered within this review.

6.1.1 OHS Framework and Regulatory Requirements of The Bahamas

The Civil Aviation Department's current approach towards the management of OHS practices has been informal to date. *The Health and Safety at Work Act*, Chapter 321C, of the Laws of the Bahamas generally requires that provisions have been taken to:

- Secure the health, safety and welfare of persons at work;
- Protect persons other than persons at work against risks to health or safety arising out of or in connection with the activities of persons at work;
- Control the keeping and use of explosive or highly flammable or otherwise dangerous substances; and
- Generally prevent the unlawful acquisition, possession and use of such substances.

The Act further establishes the duties of employers and employees as follows:

- Duties of Employers include:
    - Ensure, so far as is reasonably practicable, the health, safety and welfare at work of all employees;
    - The provision and maintenance of plant and systems of work that are, so far as is reasonably practicable, safe and without risks to health;
    - Arrangements for ensuring, so far as is reasonably practicable, safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances;

  - The provision of such information, instruction, training and supervision as is necessary to ensure, so far as is reasonably practicable, the health and safety at work of all employees;
  - So far as is reasonably practicable as regards any place of work under the employer's control, the maintenance of it in a condition that is safe and without risks to health and the provision and maintenance of means of access to and egress from it that are safe and without such risks;
  - The provision and maintenance of a working environment for all employees that is, so far as is reasonably practicable, safe, without risks to health, and adequate as regards facilities and arrangements for their welfare at work; and
  - To conduct this undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not under the supervision of the employer who may be affected thereby are not thereby exposed to risks to their health or safety.

- Duties of Employees under the Act include:
  - To take reasonable care for the health and safety of themselves and of other persons who may be affected by their acts or omissions at work; and
  - As regards any duty or requirement imposed on their employer or any other person by or under any of the relevant statutory provisions, to cooperate with them so far as is necessary to enable that duty or requirement to be performed or complied with.

Finally, the Act requires that at every place of employment where twenty (20) or more persons are employed, the employer establish a health and safety committee in accordance with regulations made under the Act.

6.1.2 Other OHS Standards: OHSAS 18001 Standard for Health & Safety Management Systems and the IFC Environmental, Health, and Safety (EHS) Guidelines

The **OHSAS 18001 standard** is internationally accepted as a method of assessing and auditing OHS management systems. Developed by leading trade and international standards bodies, it provides a framework for organisations to instigate proper and effective management of health & safety in the workplace. By having a clearly defined management system in place to identify and control health & safety risks, organisations are able to minimize risks to their workforce and visitors or external contractors on their premises. The standard helps organisations to put in place processes for continually reviewing and improving OHS.

Some of the benefits of OHSAS 18001 include:

- Create the best possible working conditions across an organisation;
- Identify hazards and put in place controls to manage them;
- Reduce workplace accidents and illness to cut related costs and downtime;
- Engage and motivate staff with better, safer working conditions;

- Demonstrate compliance to customers and suppliers; and
- Occupational Health & Safety.

The **IFC Environmental, Health, and Safety (EHS) Guidelines** are intended to be applied at a facility or project level for World Bank Group funded projects. The guideline structure is fully compatible with the one described above in the context of the OHSAS Standards. As such, the IFC EHS Guidelines consider that the effective management of environmental, health, and safety (EHS) issues entails the inclusion of Health, Safety, and Environment (HSE) considerations into corporate and facility-level business processes in an organised, hierarchical approach that includes the following steps:

- Identifying HSE project hazards and associated risks as early as possible in the facility development or project cycle, including the incorporation of HSE considerations into the site selection process, product design process, engineering planning process for capital requests, engineering work orders, facility modification authorisations, or layout and process change plans.
- Involving HSE professionals, who have the experience, competence, and training necessary to assess and manage HSE impacts and risks, and carry out specialized environmental management functions including the preparation of project or activity-specific plans and that are relevant to the project.
- Understanding the likelihood and magnitude of HSE risks, based on:
    - The nature of the project activities, such as whether the project will generate significant quantities of emissions or effluents, or involve hazardous materials or processes; and
    - The potential consequences to workers, communities, or the environment if hazards are not adequately managed, which may depend on the proximity of project activities to people or to the environmental resources on which they depend.
- Prioritizing risk management strategies with the objective of achieving an overall reduction of risk to human health and the environment, focusing on the prevention of irreversible and / or significant impacts.
- Favouring strategies that eliminate the cause of the hazard at its source, for example, by selecting less hazardous materials or processes that avoid the need for HSE controls.
- When impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences, for example, with the application of pollution controls to reduce the levels of emitted contaminants to workers or environments.
- Preparing workers and nearby communities to respond to accidents, including providing technical and financial resources to effectively and safely control such events, and restoring workplace and community environments to a safe and healthy condition.
- Improving HSE performance through a combination of ongoing monitoring of facility performance and effective accountability.

A summary of certain key documents as they relate to OHS and environmental management is presented in

Table 5 further in this report.

6.1.3 Compliance with OHS Regulatory Requirements of The Bahamas

Although the *Health and Safety at Work Act* establishes the duties of employers and employees, it was generally observed during the field visits at the Family Islands Airports that Civil Aviation Staff were sensitive to health & safety of their team as well as of flying passengers once on aerodrome grounds; there was, however, no evidence of any formal OHS framework that would include basic items such as: an OHS policy, Management Responsibilities, Planning Processes, Risk Management, Information & Training, Incident Reporting/ Investigation/Analysis & Review, Measuring and Evaluating, or even basic first aid materials could be found on site.

It is recommended that the Family Islands Airports adopt a streamlined HSE Standard proposed in **Appendix D** of this report to effectively manage their HSE requirements. Key staffing requirements in support of the implementation of OHS Programmes for Family Islands Airports include the designation of an Accountable Health & Safety and Environment (HSE) Manager representing all Family Islands Airports. It is proposed that an HSE Manager position be created for Tier 1 aerodromes, and that individual Airport Managers could implement OHS initiatives at Tier 2 aerodromes. OHS issues at Tier 3 aerodromes would be managed through the centralized Family Islands Airports HSE Manager.

6.2 CURRENT PRACTICES IN ENVIRONMENTAL MANAGEMENT

The following sections provide a listing and summary of Environmental documents and institutional instruments that were considered within this review.

6.2.1 Environmental Framework and Regulatory Requirements of The Bahamas

The Civil Aviation Department's current approach towards the management of environmental practices has been informal to date. The Bahamas Civil Aviation Act's Safety Regulation (BASR) has included a revised Schedule 21 in 2013 (Aerodrome Standards & Certification). Under Section 21.467 of Schedule 21, an application for the issuance of an aerodrome certificate or an amendment thereto, shall be made in the form and manner prescribed by the Authority (BCAD) and is accompanied by *an environment impact assessment report*. The BASR also identifies the requirements for land-use environmental controls to be in place for aerodrome design as part of the common reference system (Section 21.015) and details the environmental management requirements to reduce wildlife hazards (section 21.583).

Schedule 21 requires that Aerodrome developers follow the guidance on all aspects of the planning of aerodromes, including security and environmental control considerations, contained in the ICAO Airport Planning Manual (Doc 9184), Parts 1 and 2. However, the aerodrome Certification process for the Family Islands Airports has not yet been implemented and the organisational structure to ensure compliance with these ICAO standards linked to Schedule 21 of the regulations has not been established to date.

Legislation at the domestic level within The Bahamas, which were considered within the scope of preparation of this report and associated Appendices, where relevant, includes:

- Environmental Health Services Act, 1987;
- Bahamas National Trust Act, 1959, Amendment (2010);
- Antiquities, Monuments, and Museum Act, 1998;
- Water and Sewerage Corporation Act, 1976;
- Public Works Act, 1964;
- Buildings Regulation Act, 1971;
- Derelict Motor Vehicle (Disposal) Act;
- Disaster Preparedness and Response Act;
- Antiquities, Monuments, and Museum Act, 1998;
- Wild Animals (Protection) Act, 1968;
- Wild Birds Protection Act, 1952;
- Wildlife Conservation and Trade Act, 2004;
- Plants Protection Act, 1916;
- Plants Protection Order 1918;
- Declaration of Protected Trees Order, 1997;
- Prohibition of the Importation of Plants Order, 1971;
- Coast Protection Act, 1968;
- Conservation and Protection of the Physical Landscape of The Bahamas Act, 1997;
- Conservation and Protection of the Physical Landscape of The Bahamas Regulations, 1997;
- Declaration of Protected Trees Order, 1997;
- Forestry Act, 2010; and
- Planning and Subdivision Act, 2010 Replaces Town Planning Act, 1961.

In addition to legislation, The Bahamas has Guidelines in place related to both Environmental Impact Assessment and National Environmental Strategies, as follows:

Guidelines related to Environmental Impact Assessment:

- Bahamas Environment Science & Technology Commission (BEST) Environmental Impact Assessment Guidelines; and
- Bahamas Environment Science & Technology Commission (BEST) Environmental Impact Assessment Guidelines (Family Islands).

Guidelines related to National Environmental Strategies:

- Bahamas National Wetland Policy;
- National Action Plan to Combat Land Degradation;
- National Policy for the Adaptation to Climate Change;
- First National Communication on Climate Change;
- Bahamas State of Environment Report;
- The National Self Capacity Needs Self-Assessment Report;
- Bahamas National Report on Integrating Management of Watersheds and Coasts;
- National Invasive Species Strategy; and
- Bahamas Land Use and Planning Project.

Government institutions within The Bahamas with some responsibility and/or authority over environmental activities that were contacted by the Stantec Team in the execution of the environmental review and institutional analysis include:

- Bahamas Environment, Science, and Technology Commission (BEST);
- Department of Physical Planning;
- Bahamas Electricity Corporation;
- Water and Sewage Corporation;
- Department of Environmental Health Services; and
- Department of Local Government and Island Administration.

Non-governmental organisations with interest and influence over the environment that were contacted by the Stantec Team in the execution of the environmental review and institutional analysis include:

- Bahamas National Trust;
- Friends of the Environment;
- Save the Bays; and
- The Nature Conservancy.

6.2.1.1 Environmental Impact Assessment Framework of The Bahamas

The Bahamas Environment, Science & Technology (BEST) Commission was established in 1994 to manage the implementation of multilateral environmental agreements and review environmental impact assessment and management plans for development projects within the Bahamas. The Bahamas does have legislation pertaining to the environment but it lacks an overall regulated environmental framework. The Bahamas recognized its shortcomings and limited capacity to handle environmental matters and received funding from the Global Environment Facility for a capacity assessment (2005); the details of which are discussed further in the Institutional Analysis section of this report.

The need for an Environmental Impact Assessment is project specific and determined by consultation with various agencies and departments. Though suggested in legislation, an Environmental Impact Assessment is not mandated. The *Planning and Subdivision Act* 2010 emphasizes Environmental Impact Assessments and Environmental Impact Statements; however, there are yet to be accompanying regulations for implementation and enforcement.

For example: Chapter 260 *Conservation and Preservation of the Physical Landscape of the Bahamas Act* 1997 provides for the application for the grant of a permit in relation to any excavation or landfill operation. It states that the application may contain documents as required by the Act or Director. The application "*shall, if required by the Director, furnish in addition, together with the application, an assessment of the possible impact of that excavation, or landfill operation, upon the environment; and the assessment shall include particulars of the wildlife habitat history of the location of the proposed excavation or landfill operation, particulars of the historic and other features of that location and such other particulars as may be prescribed.*"

In The Bahamas, a project is presented to the Bahamas Investment Authority under the direction of the Office of the Prime Minister. Pre-application consultation meetings are recommended with applicable departments to solicit initial commentary in order to strengthen the application being submitted. Depending on the project components, a meeting may take place with the BEST Commission to discuss potential environmental considerations and the extent to which an environmental assessment would be required. The application requires a summary of environmental considerations.

After an application is submitted to the Office of the Prime Minister, the application is circulated by the Government to relevant agencies and departments for comments. The application is assigned to a Project Officer within the Bahamas Investment Authority whose responsibility is to collate responses and package the application for presentation to the National Economic Council. The National Economic Council is made up of the Cabinet members and chaired by the Prime Minister. The National Economic Council determines whether project approval is given, and if so, preliminary approval subject to terms based on commentary received from the various agencies and departments. For example, preliminary approval would be granted for a project subject to the completion of an Environmental Impact Assessment.

Once a formal recommendation is made for an environmental impact assessment, a scoping meeting is scheduled with BEST. The meeting outlines issues of greatest concern and determines the terms of reference. BEST may recommend additional EIA components such as geotechnical studies, flushing analysis, and coastal modelling. The EIA is submitted to the BEST Commission which reviews the document and circulates to other relevant departments for commentary such as the Port Department if necessary. BEST provides return comments and the EIA is amended accordingly or discussion ensues to provide clarification. Here, BEST may require the submittal of an Environmental Management Plan prior to the commencement of construction. To note, the BEST Commission is not a regulatory agency and its authority is limited to providing recommendations to the Ministry of the Environment and Housing. However, the Ministry of the Environment and Housing generally defers to BEST as its advisor.

The EIA process is not defined in legislation and human and financial resources are serious constraints to timely and comprehensive review. Due to the inadequate allocation of human and financial resources, the application review time period is difficult to gauge and may take several months leading to project delays. The inability to schedule a review and comment period can significantly impede project development.

6.2.1.2 Waste Management Regulations

At present, all domestic and international waste is mixed at the source and disposed of in the New Providence Landfill; however, this is in contravention of the Pan American Health Organisation guidelines to prevent the spread of animal diseases. International waste is supposed to be segregated at the source, transported separately to the landfill, and disposed of within a designated area per instructions from the Department of Environmental Health Services (DEHS). An alternative to landfilling needs to be evaluated further. Bahamas Waste Limited operates an autoclave for the treatment of medical waste. This technology is also acceptable

for the treatment of international waste. The waste is heated to 1,600 degrees Fahrenheit and the unit has a 1,000-pound capacity per cycle. Any alternative to landfilling will need to be evaluated and approved by the DHSE.

The Bahamas hazardous materials requirements are found in the *Environmental Health and Services Act* which has been in force in the Bahamas since 1987. The basic requirements of the *Environmental Health and Services Act* prohibit anyone from depositing, adding to, emitting or discharging into the environment any contaminant or pollutant from any source. This is further emphasized in Schedule 21 of the BASR (21.025).

6.2.1.3 Conservation and Preservation of the Physical Landscape of the Bahamas Act, 1997

The purpose of Chapter 260: Conservation and Preservation of the Physical Landscape of the Bahamas Act is to make the provision for the conservation and protection for the physical landscape of The Bahamas. The Act applies to any excavation, landfill operation, quarrying or mining of physical resources, the harvesting of protected trees, and any excavation carried out by a person for the tourism related and large scale luxury residential developments.

Protected Trees are specified in the Conservation and Protection of the Physical Landscape of The Bahamas (Declaration of Protected Trees) Order, 1997. This includes the following trees (Common Name/Botanical Name):

- Beefwood/Pigeon Berry/Narrow Leaved Blolly — *Guapira discolor*
- Black Ebony/Bullwood — *Pera bumeliifolia*
- Brasiletto — *Caesalpinia vesicaria*
- Candlewood — *Gochnatia ilicifolia*
- Caribbean Pine — *Pinus caribaea var. bahamensis*
- Horseflesh — *Lysiloma sabiau var. bahamensis*
- Lignum Vitae — *Guaiacum sanctum*
- Mahogany (Madeira) — *Swietenia mahagoni*
- Rauwolfia — *Rauvolfia nitida*
- Red Cedar — *Juniperus bermudiana*
- Silk Cotton — *Ceiba pentandra*

Permit Applications under the *Conservation and Protection of Physical Act* include:

1. Application for Permit to Carry Out Excavation or Landfill Operation (First Schedule, Form 1, Regulation 2)
2. Application for a Licence to Quarry or Mine (Form 2, Regulation 3)
3. Application for a Permit to Harvest a Protected Tree (Form 3, Regulation 4)
4. Permit in Relation to Excavation or Landfill – Issued by the Director of Physical Planning (Form 4, Regulation 5)
5. Licence to Excavate or Landfill – Issued by the Director of Physical Planning (Form 5, Regulation 6)

6. Permit to Harvest a Protected Tree Issued by the Director of Physical Planning

6.2.1.4 Wildlife Management in The Bahamas

As an archipelago, The Bahamas relies on airports to serve as critical points of connectivity to support the local population and the tourism industry. These airports are frequently located in close proximity to water bodies including wetlands, lakes, and the coastal shore, which attract wildlife namely avian species. Moreover, The Bahamas and conservation organisations have identified areas important to avian species with varying degrees of legal protection. Some of these areas of importance are located within the boundary of or in close proximity to airports. Wildlife management plans promote aviation safety by reducing environmental hazards such as bird strikes by implementing mitigation strategies.

This section outlines existing wildlife legislation, areas of avian importance, and preliminary considerations for inclusion in wildlife management guidelines for Family Island Airports.

- ***Wild Animals (Protection) Act*. Chapter 248.** Animals restricted for capture, export, or attempt to export include:
    i. Wild horses in the Island of Abaco, that is to say, any member of the species *Equus Caballus* in that Island in a state of nature, including the young of that species.
    ii. The Agouti or Hutia (*Geocapromys ingrahami*).
    iii. The Iguana (*Cyclura* species).

- ***Wild Birds Protection Act*. Chapter 249**. Protected Bird Species and Duration of Closed Season:
    i. All wild birds other than those enumerated in items 2 and 3 of the schedule:
        - The Whole Year.
    ii. White Crowned Pigeon (*Columba Leucocephala*), Zenaida or Wood Dove (*Zenaida aurita*), Ringnecked Pheasant (*Phasianus colchicus*), Guinea Fowl (*Numida meleagris*):
        - 1st March to 28th September.
    iii. Bob White Quail (*Colinus virginianus*), Chuckar Partridge (*Alectorisgraeca*), Wilson's or Jack Snipe (*paella gallinago delicata*), Coot (*Fulicia americana*), all wild ducks and geese (Family *Anatidae*) EXCEPT Whistling Duck (*Dendrocygna arborea*), Bahama Duck (*Anas ahamensis*), Ruddy Duck (*Oxyrua jamaicensis*):
        - 1st April to 28th September.
    iv. Eurasia-collared or 'Ringnecked' Dove (*Streptopelia decoacta*), Mourning or Florida Dove (*Zenaidura macroura*):
        - 1st March to 14th September.

- **Wild Birds Protection RESERVES, Chapter 249.** A listing of all reserves for the protection of wild birds.

- **Wildlife Conservation & Trade Chapter 250A**. "*An Act to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), with a view to the protection of wild species from harm through unsustainable exploitation.*
    i. *Fourth Schedule: Provides a listing of plants and animals in the Bahamas*."
- ***Conservation and Preservation of the Physical Landscape Act.*** This Act provides protection of the physical landscape and provides a protected tree species listing.
- ***Bahamas National Trust Act***. An entity to designate National Parks in The Bahamas.

Challenges. The Bahamas has at least three (3) separate designations for areas important to bird species: National Parks, Wild Bird Reserves, and Important Birds Areas (IBAs). National Parks afford legal protection of species within the park boundaries, but the other two designations do not have regulatory enforcement. Moreover, these areas are not identified and promoted through a single government agency. As such boundaries and overlaps are cumbersome to identify and not readily known. The proximity of National Parks, Wild Bird Reserves, and IBAs requires an airport specific environmental assessment performed in close association with local conservation agencies and the Bahamas National Trust in order to adequately identify and document avian hazards.

As an example, the San Andros Pond IBA is situated within the security boundary at the San Andros Airport. The classification of an IBA within the boundary of an airport presents a potential source of conflict between the preservation of avian species and wildlife management techniques to lessen the potential of bird strikes with aircraft. Though the designation of IBA does not afford legal protection to San Andros Pond, it does recognize the presence of bird species listed as threated and with restricted range.

Animals. The *Wild Animals (Protection) Act*, Chapter 248, restricts the capture, export or attempted export of the following animals:

1. Wild Horses on the Island of Abaco, including any member of the species *Equus Caballus*.
2. Agouti or Hutia (*Geocapromys ingrahami*).
3. Iguana (*Cyclura* species).

With regards to airports, the animals listed under the *Wild Animals (Protection) Act* are not likely to enter airport premises with adequate security measures in place such as perimeter fencing. Animal control at airports in the Bahamas should focus on the prevention of entry by feral species such as hogs, dogs, cats, raccoons, cows, and donkeys.

Birds. The Bahamas supports a number of measures to identify and protect areas of importance to *avifauna* species. The Bahamas has 28 National Parks under the jurisdiction of the Bahamas National Trust (BNT), a number of Wild Bird Reserves, and 42 identified Important Bird Areas (IBAs).

The Bahamas has a total of 270 avian species, 157 of which are land birds, 228 are migrants that pass through the islands or winter, 5 of which are breeding endemic, 38 of which are seabirds, and 97 of which are considered water birds. A majority (253) of the avian species are

considered to be of least concern according to the IUCN Red List Status. The Bahamas does have two (2) birds that considered critically endangered, one being the Bahama Oriole, *Icterus northropi* endemic and breeding on Andros; and the other being critically endangered and potentially extinct, Jamaica Petrel, *Pterodroma caribbaea,* where the last species collected was in 1879.

The *Wild Birds Protection Act (Chapter 249)* is 'an Act to make provision for the protection of wild birds'. Section 4 of the *Wild Birds Protection Act* (Chapter 249) identifies 'places that have been declared reserves for the protection of wild birds'. The intent of the reserves per the Act is to establish areas for the protection of wild birds and to allow for provision of an offence. The Act stipulates that 'any person who enters upon any such reserve with intent to kill or capture any wild bird shall be guilty of an offence against this Act'.

Wild Bird Reserves in close proximity to airport boundaries may indicate an elevated risk for environmental hazards, i.e. bird strikes. An avifauna assessment by airport with respect to proximity of wild bird reserves will provide data to identify the dominant species, abundance, and its hazard rating to aircraft.

Important Bird Areas. The Bahamas has 42 identified Important Bird Areas (IBAs). Of note are three (3) identified IBAs, San Andros Pond, Driggs Hill to Mars Bay, and Southern Great Lake, which occur within the boundary of or close to the airports on Andros and San Salvador. It is important to recognize that the San Andros Pond IBA is located within the security boundary of the San Andros Airport.

Based on the above and confirmed in communications with local specialist that include Ms. Eleanor A. Phillips of the Nature Conservancy and Ms. Lynn Gape at the Bahamas National Trust, the airports of concern include the following:

Table 2: Significant Ecological Consideration at Family Islands Airports

Airport Name	Significant Ecological Consideration[1]
Andros: San Andros Airport	IBA within Airport Security Boundary • San Andros Pond (BS008), Important Bird Area (IBA)/Unprotected (not a National Park) • 2 threatened birds • 3 restricted-range birds
Congo Town Airport – Driggs Hill to Mars Bay	• Important Bird Area (IBA) • 2 threatened birds • 4 restricted-range birds • Congregatory Birds
San Salvador – Cockburn Town Airport, Southern Great Lake (BS029)	• Important Bird Area (IBA) • 4 restricted-range birds • Congregatory Birds

Note 1: References:

Birdlife International (2014) Species factsheet: *Icterus northropi*. Downloaded from http://www.birdlife.org on 19/05/2014. Recommended citation for factsheets for more than one species: Birdlife International (2014) IUCN Red List for birds. Downloaded from http://www.birdlife.org on 19/05/2014.

Birdlife International (2014) Species factsheet: *Pterodroma caribbaea*. Downloaded from http://www.birdlife.org on 19/05/2014. Recommended citation for factsheets for more than one species: Birdlife International (2014) IUCN Red List for birds. Downloaded from http://www.birdlife.org on 19/05/2014.

Wege, D. C. and Anadon-Irizarry, V. (2008) Important Bird Areas in the Caribbean: Key Sites for Conservation. Birdlife International.

Table 3: Other Ecological Consideration at Family Islands Airports

Airport	International Flights	Domestic Flights	Charter Flights	Items of Environmental Interest	National Parks/Wild Bird Reserves	Cultural Interest
Marsh Harbour International Airport, Abaco Island	X	X		Significant area of wetlands to east of runway	Closest in proximity but not of concern: 1. Tilloo Cay Reserve 2. Pelican Land and Sea Park 3. Fowl Cays National Park	Currently uncontrolled airspace

Airport	International Flights	Domestic Flights	Charter Flights	Items of Environmental Interest	National Parks/Wild Bird Reserves	Cultural Interest
Treasure Cay International Airport, Abaco	X	X		Last known sightings of wild horses (*Equus Caballus*) of Abaco Horses are listed as Protected under Wild Animals (Protection) Chapter 248	Closest in proximity but not of concern: 1. Black Sound Cay Reserve 2. No Name Cay Reserve (Marine Protected Area) 3. Crab Cay Marine Reserve	Close proximity of blue hole to runway
Sandy Point Airport, South Abaco			X	Nesting / Foraging area for endemic *Amazona lecocephala bahamensis(Abaco Parrot)*	Closest in proximity: 1. Abaco National Park	None
Moores Island Airport, Moores Island			X	None	None	None
Great Harbour Cay Airport, The Berry Islands	X	X		Wetlands on approach to 31	None	None
South Bimini Airport	X	X		Close proximity to coastline on approach to 27	None	None
San Andros International Airport	X	X		Wild Boar	Wild Bird Area to the North 1. Joulter Cays	None
Andros Town Airport, Andros Island	X	X		Close proximity to wetlands on approach: Wild Boar	Closest in proximity: 1. Crab Replenishment Area 2. Southern Marine Park 3. Blue Holes National Park 4. West Side National Park	AUTEC Base is located directly to the west of the runway
Congo Town Airport, South Andros	X	X		None	Closest in proximity: 1. West Side National Park	None
Clarence A Bain Airport,		X		Wetlands on approach	Closest in proximity:	None

Airport	International Flights	Domestic Flights	Charter Flights	Items of Environmental Interest	National Parks/Wild Bird Reserves	Cultural Interest
Mangrove Cay, Andros					1. West Side National Park	
New Bight Airport, Cat Island	X	X		Wetlands on approach	No National Parks	Cat Island has many ruins
Arthur's Town Airport Cat Island		X		None	No National Parks	Cat Island has many ruins
North Eleuthera International Airport	X	X		None	No National Parks	None
Governor's Harbour International, Eleuthera	X	X		None - though parallels coast at short distance, drainage may be an issue during heavy storm events	No National Parks	None
Rock Sound International Airport, Eleuthera	X	X		Parallels adjacent to coast with presence of wetland features to southeast - drainage may be an issue during heavy storm events	No National Parks	Not anticipated
Exuma International Airport	X	X		Extensive wetlands to south at some proximity	No National Parks	None
Stella Maris Airport, Long Island	X	X		Wetlands on approach to 31	No National Parks	None
Deadman's Cay Airport, Long Island		X		None	No National Parks	None
Staniel Cay Airport		X		Close proximity of wetlands and water	At some Distance 1. Exuma Cays Land and Sea Park	None
Farmers Cay Airport		X		Thresholds of 18 / 36 on coastline	None	None

Airport	International Flights	Domestic Flights	Charter Flights	Items of Environmental Interest	National Parks/Wild Bird Reserves	Cultural Interest
Black Point Airport, Exuma		X		Wetlands present in close proximity	None	None
Port Nelson, Rum Cay Airport			X	Presence of free ranging feral cattle, wetlands in close proximity	None	None
San Salvador International Airport	X	X		Approach to 10 on coastline	Five Proposed National Parks for San Salvador. In close proximity: 1. San Salvador Dive Site Protected Area	None
Ragged Island Airport			X	Wetland on approach to 13	None	None
Matthew Town Airport, Inagua Island	X	X		Presence of free ranging feral donkeys, cows, and boars	In close proximity: 1. Union Creek Preserve 2. Inagua National Park	Largest known breeding colony of West Indian flamingo
Crooked Island Airport		X		Wetland terrain exists in close proximity to runway start/end	None	None
Spring Point Airport Acklins Island		X		None	None	None
Mayaguana Airport		X		None	None	Recently opened 04/22/2014

6.2.1.5 Wildlife Management Plans for Certified Aerodromes

Under Schedule 21 of the BASR, Wildlife management plans fall under the Subpart F: Operating Requirements, Section 21.583 Wildlife Hazard Reduction. Wildlife management needs to be created as part of the environmental management programme for aircraft operations at certified aerodromes. These become linked to the aerodrome SMS as wildlife represents a significant strike hazard. The following provides an outline of regulatory expectations for Wildlife Management Plans in accordance with Schedule 21.

1. Risk Identification: Wildlife hazards at or near the airport.
2. Risk Management: Measures to manage/mitigate wildlife risk.
3. Methods for Risk Compliance: Actions by operator to satisfy risk reduction (firearms, wildlife control permits, wildlife strikes, wildlife management logs, evaluation of habitats, land use and food sources).

4. Habitat Management: Airport Policy for management of habitat for wildlife control.
5. Prohibits feeding of wildlife and exposure of food wastes.
6. Inventory of endangered or protected wildlife at the airport.
7. Identify roles of personnel and agencies involved in wildlife management issues and contact numbers for each.
8. Provide details of any wildlife hazard awareness programme.

Operator Responsibilities

1. Provide relevant training once every five years for airport wildlife manager or person assigned responsibility.
2. Ensure responsible person holds applicable firearm permit.
3. Keep a record of each person's training for a period of five years.

Communication

1. Airport operator to establish communication protocol and alter procedure for wildlife and risks associated with wildlife.

ICAO Bird Strike Information System (IBIS)

1. Airport operator make an assessment of bird strike hazard and submit bird strike reports to IBIS (this is also specified in the State Safety Program, or SSP).

Proposed Framework. The proposed framework for wildlife management planning at Family Island Airports considers the frequency of aerodrome operations and location of the airport. It is intended to become a component of the Environmental Management Plan (EMP) as outlined in the proposed standard in **Appendix D** (HSE Standard) of this report. Wildlife management must focus on pre-emptive mitigation measures for remote operation and occasional lapses in organisational capacity for regular maintenance.

Recommendations. In order to create effective Wildlife Management Plans, the following is proposed:

1. Environmental Baseline Assessments for each government operated aerodrome in the Family Islands to determine the presence of avian species, botanical species and habitat types specific to the airport. Airport specific biological surveys will enhance risk assessment and subsequent wildlife mitigation strategies.
2. Coordinate identified endangered species and probable locations with the Bahamas National Trust, which has historical information and knowledgeable staff.
3. Airports with a significant presence of avifauna should establish levels through visual recording peak times for avifauna congregation and flight. Local knowledge of avifauna movements may influence flight operations at airports.
4. Civil Aviation Department will play a central authority role to collect data and compile data to analyse for risk hazards and implement changes to airport risk management as necessary.

5. For all certified aerodromes under Schedule 21, prepare a wildlife hazard reduction plan (wildlife management plan) and incorporate by reference with the aerodrome SMS.

6.2.2 ICAO Environmental Standards and Initiatives

The International Civil Aviation Organisation (ICAO) works with global industry and aviation organisations to develop international Standards and Recommended Practices (SARPs) which are then recommended for use by its signatory states in developing legally-binding civil aviation regulations at the national level.

In 2004, ICAO adopted three major environmental goals applicable to aerodrome emissions, which were aimed at:

a) Limiting or reducing the number of people affected by significant aircraft noise;
b) Limiting or reducing the impact of aviation emissions on local air quality; and
c) Limiting or reducing the impact of aviation greenhouse gas emissions on the global climate.

The approach promoted by ICAO is to "Quantify and Mitigate". As such, expectations exist where management systems are put in place to allow the capture of the data through reporting, with associated objectives and targets for reductions through mitigation activities/policies/guidelines.

It should be noted that much of the information and standards available through ICAO relate to aviation operations, rather than aerodrome operations. For the purposes of the current scope of work, a review was undertaken of documentation issued by ICAO, in the context of its relevance to environmental protection and management within airport operations. The results of this review are presented in Table 4 below. Information presented has been incorporated into the Guidelines presented in **Appendix E** of this report, where appropriate.

Table 4: ICAO Environmental Protection/Standards

Environmental Protection Topics	Details/Recommendation
Aircraft Noise	ICAO guidance on this subject is contained in Annex 16, Volume I, Part IV and in the *Airport Planning Manual*, Part 2 — *Land Use and Environmental Control* (Doc 9184). The manual provides guidance on the use of various tools for the minimization, control or prevention of the impact of aircraft noise in the vicinity of airports and describes the practices adopted for land-use planning and management by some States to ICAO. Several methods are provided related to reduction of noise impacts, (land-use planning and acoustical barriers), including preferential runways and routes, as well as noise abatement procedures for take-off, approach and landing. **Recommendation**: Adopt proposed Guideline in **Appendix E** of this report

Environmental Protection Topics	Details/Recommendation
Local Air Quality/Air Pollution	ICAO is working on initiatives to improve local air quality, as well as proposing mitigation measures for air pollution associated with airports related to aircraft, vehicles and facility operations (terminal buildings, cargo and maintenance facilities). **Recommendation**: Adopt proposed Guideline in **Appendix E** of this report
Air-Conditioners/ Chillers	Airlines and airports use CFCs and other ozone-depleting substances in air-conditioning and chilling systems. ICAO assumes that member states have regulations or standards in place to effectively manage these substances in order to reduce emissions into the atmosphere (*Source: Airport Planning Manual Part 2 - Land Use and Environmental Control)* **Recommendation**: There is a need for a National Initiative to be implemented
Petroleum/ Chemical Management	Aircraft maintenance areas, as well as automotive and equipment service areas, should be provided with oil water separators (OWS), which are connected to sanitary sewers leading to treatment plants. (*Source: Airport Planning Manual Part 2 - Land Use and Environmental Control)* **Recommendation**: Adopt proposed Guideline in **Appendix E** of this report
Oil Spills	A pollution control programme should incorporate (*Source: Airport Planning Manual Part 2 - Land Use and Environmental Control*): - Good housekeeping to minimize accidental spills - Removal of spilled oil through containment and spill recovery - Completion of regular maintenance activities - Ban on equipment washing in apron areas - Immediate cleaning of all spills using appropriate materials - Airport personnel must respond to spill reports - Installation of monitoring wells to determine the presence of oil underground. Storage areas should be located as close to the aircraft fuelling as possible - adverse effects on the environment due to spills should be minimized *(Source: Airport Planning Manual Part 1)* **Recommendation**: Adopt proposed Guideline in **Appendix E** of this report
Waste Management	Airports should establish a dedicated programme for management of waste (4Rs - reduce, reuse, recycle and recover). Plan should include (*Source: Airport Planning Manual Part 2 - Land Use and Environmental Control*): - Describe waste reduction (reduce or eliminate operations/processes that generate solid waste, redesign processes to reduce waste, substitute products for waste reduction) - Choose green products - Compost organic wastes - Training for proper material handling to reduce waste and spills - Written procedures for loading/unloading and transfer operations - Track waste generated - Isolate hazardous wastes **Recommendation**: Adopt proposed Guideline in **Appendix E** of this report

Environmental Protection Topics	Details/Recommendation
Land-Use/Airport Planning	The requirement for land-use planning in the vicinity of an airports is twofold: 1) To provide for airport needs (obstacle limitation areas and future airport development) 2) To ensure minimal interference to the environment and the public (e.g. by locating residential areas away from zones subject to excessive noise) Most land-use planning information in ICAO relates to noise reduction (*Source: Airport Planning Manual Part 2 - Land Use and Environmental Control)* Airport planning - Environment: Note locations of wildlife reserves and migratory areas. Also note noise-sensitive areas such as schools and hospitals. Environmental factors should be considered in the development of a new airport or the expansion of an existing one. Studies of the impact of the construction and operation of a new airport or the expansion of an existing one upon acceptable levels of air and water quality, noise levels, ecological processes and demographic development of the area must be conducted to determine how the airport requirements can be best accommodated. Noise is the most severe environmental problem for airport development. Other important environmental factors include: air and water pollution, industrial wastes and domestic sewage originating at the airport and the disturbance of natural environmental values. The environmental study must address water pollution. The environmental study must indicate how disruptions to the environment might be alleviated. (*Source: Airport Planning Manual Part 1: Master Planning)* **Recommendation**: Ensure proper oversight of Schedule 21 under the BASR
Environmental Impact Assessment	Airport Planning Manual Part 2 - Land Use and Environmental Control includes all information that should be included in the EIA. **Recommendation**: Ensure proper oversight of Schedule 21 under the BASR
Environmental Management	Environmental awareness, planning and monitoring and remedial measures (promote environmental awareness, complete environmental assessments and audits, monitoring & compliance programmes, environmental emergency contingency plans and include remedial measures to correct situations resulting from material handling and management practices of the past). Airport Planning Manual also described ISO 14001 EMS and adoption at airports. (*Source: Airport Planning Manual Part 2 - Land Use and Environmental Control)* **Recommendation**: Adopt proposed HSE Standard in **Appendix D** of this report

Environmental Protection Topics	Details/Recommendation
ICAO report on EMS Practices in the Aviation Sector	Various aviation organisations completed a survey related to EMS. Areas of environmental concern include: aircraft noise, fuel efficiency, financial, compliance with laws and regulations, state policies, company core values and ethics, global climate change, non-governmental organisations, corporate commitment and vision, capacity and growth constraints, soil and water protection, energy management, materials and chemicals management, operational efficiency, customers' and other stakeholders' concerns. Top five areas of environmental regulatory concern (ordered high to low) include: Hazardous/solid waste, Water, National environmental regulations, Air and Noise. Respondents were looking to reduce their consumption of energy, waste, water, emissions and noise, with environmental targets and objectives set on average at not more than five years ahead. Top three EMS implementation challenges include: Resources (time, finances), Culture change, Employee awareness/training, Management commitment. Organisations without EMS, top 5 environmental programmes: environmental vision/policy, goals/objectives/targets, operational controls, employee awareness training programmes, compliance audits/inspections and emergency preparedness. **Recommendation**: Adopt proposed HSE Standard in **Appendix D** of this report
Wildlife Management	*Source: Airport Services Manual Part 3 - Bird Control and Reduction.* Information provided for bird/wildlife strike control programme. Role of the State CAA: • The CAA should ensure that any procedures in the airport certification manual relating to bird/wildlife control are developed and implemented as part of the aerodrome safety management system (SMS). • Reducing the presence of wildlife in aircraft flight paths can be achieved with ecological means such as habitat management or the dispersal or removal of hazardous wildlife. While the wildlife control programme will be airport specific, the development of such nature and environmentally sensitive programmes should adhere to national environmental regulations. • Each airport operator has the responsibility to develop, implement and demonstrate an effective bird/wildlife strike and wildlife control programme at the airport, and this should be tailored and commensurate to the size and level of complexity at the airport, taking into account of the identification of the bird hazard and the risk assessment of that hazard. • Before undertaking activities to manage the environment, it is important to first carry out an ecological survey of the airport and surrounding area to identify sources of food, water and shelter attractive to wildlife on and in the vicinity of the airport. This way, the environmental management plan is able to deal with specific conditions or habitats that are attracting wildlife. (Additional Source: Airport Services Manual Part 8: Airport Operational Services) **Recommendation**: Ensure proper oversight of Schedule 21 under the BASR

As detailed earlier, Schedule 21 of the BASR requires that Aerodrome developers follow the guidance on all aspects of the planning of aerodromes contained in the ICAO Airport Planning Manual (Doc 9184), Part 1 (Master Planning) and Part 2 (Land Use and Environmental Control).). This ICAO reference assumes that all local regulations are adhered to in the planning and operation of certified aerodromes. Furthermore, ICAO Resolution A28-2: ICAO global planning for safety and air navigation and A38-17: Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air

quality, from the Resolutions Adopted at the 38th Session of the Assembly, re-emphasize the ICAO commitment to global planning for sustainability.

Understanding that the intent by ICAO in the development of environmental goals are mostly targeted to Airline Companies and manufacturers to stimulate the development of quieter and cleaner burning engines and fuel, there is still an opportunity for airports to ensure that airport planning and operations is executed in such a way as to mitigate where possible noise and air quality issues on approach, take off and on the apron. Noise restrictions at aerodromes from aircraft operations are further referenced in Schedule 10 (Operations of Aircraft) and Schedule 17 (Mass & Balance & Performance) of the BASR.

6.2.3 International Legislation and Other Guidance Documents

A range of additional legislation and documents at the international level exist with respect to defining environmental requirements that may be applied to operations at Airports including:

- Vienna Convention for the Protection of the Ozone Layer (1985);
- Montreal Protocol on Substances that deplete the Ozone Layer (1987);
- Basel Convention on the Control of Trans boundary Movements of Hazardous Waste and their Disposal (1989);
- United Nations Framework Convention on Climate Change (1992);
- Convention on International Trade in Endangered Species-Wild Fauna and Flora with Appendices (CITES) (1973);
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar);
- Convention on Biological Diversity (1992);
- United Nations Convention on the Law of the Sea (LOS);
- International Finance Corporation's (IFC) Policy on Environmental and Social Sustainability; and
- FAA Aviation Environmental Tool Suite.

The proposed adoption of the HSE Standard in **Appendix D** with associated Guidelines in **Appendix E** will allow the Airports in The Bahamas and BCAD to demonstrate an appropriate level of environmental due diligence that meets the intent of the aforementioned laws and protocols.

6.2.4 Other Best Environmental Practices: ISO 14001 Standard for Environmental Management Systems

The ISO 14001 standard sets out the criteria for an environmental management system and is a standard which an organisation can be certified to. It does not state requirements for environmental performance, but maps out a framework that a company or organisation can follow to set up an effective environmental management system. It can be used by any organisation regardless of its activity or sector. Using ISO 14001 can provide assurance to management and employees as well as external stakeholders that environmental impacts are

being measured and improved. The benefits of considering the ISO 14001 standard template as an international best practice in the development of the Environmental Guidelines include:

- Opportunities for reduced cost of waste management;
- Opportunities for savings in consumption of energy and materials; and
- Improved corporate image among regulators, customers and the public.

The adoption of an HSE standard that follows the structure of the ISO 14001 framework will further allow BCAD and all airports in The Bahamas to identify hazards and risks as they relate to the environment, and also provide a system for ensuring compliance to regulations and promoting continuous improvement in environmental sustainability.

Table 5: Summary Policy Scan of Standards related to Environmental Management and Recommendations

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
International Finance Corporation's (IFC) Policy on Environmental and Social Sustainability	The IFC Mandate is to provide investment and advisory services to developing countries. The IFC has articulated a number of performance standards to guide its activities related to sustainable development. Environmental Performance Standards include: • Air Emissions and Ambient Air Quality • Energy Conservation • Wastewater and Ambient Water Quality • Water Conservation • Hazardous Materials Management • Waste Management • Noise • Contaminated Land	Projects that seek IFC funding will be evaluated in part on their performance related to environmental compliance. The exact formula for this evaluation is project specific. Construction and Decommissioning requirements include consideration for: • Environmental protection • Occupational Health & Safety • Community Health & Safety	The IFC has a high level of integration with other environmental and OHS aspects.	The applicability of the IFC guidelines is not mandatory to airports in The Bahamas. **Recommendation**: Adopt proposed HSE Standard in **Appendix D** of this report

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
International Finance Corporation's (IFC) Environmental, Health, and Safety (EHS) Guidelines	The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these HSE Guidelines are applied as required by their respective policies and standards. These General HSE Guidelines are designed to be used together with the relevant Industry Sector HSE Guidelines which provide guidance to users on HSE issues in specific industry sectors.	OHS consideration require plans for the following: Occupational Health & Safety • General Facility Design and Operation • Communication and Training • Physical Hazards • Chemical Hazards • Biological Hazards • Radiological Hazards • Personal Protective Equipment (PPE) • Special Hazard Environments • Monitoring Community Health and Safety • Water Quality and Availability • Structural Safety of Project Infrastructure • Life and Fire Safety (L&FS) • Traffic Safety • Transport of Hazardous Materials • Disease Prevention • Emergency Preparedness and Response	The IFC has a high level of integration with other environmental aspects.	The applicability of the IFC guidelines is not mandatory to airports in The Bahamas. **Recommendation**: Adopt proposed HSE Standard in **Appendix D** of this report

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
USGB LEED - Energy and water use and conservation criteria (Addressed in more detail in the companion document to this consultancy: Task 4 Energy and Water Strategy for the Bahamas Family Islands Airports.)	USGBC LEED is an environmental assessment methodology that provides guidance on the design of new commercial buildings. Components of the methodology address: • Sustainable sites • Water efficiency • Energy efficiency • Materials and resources • Indoor environmental quality • Innovation in design • Regional priority credits The tool is designed to enable users to achieve different levels of performance ranging from certified, silver gold and platinum.	LEED provides a suite of tools that may be used to evaluate new construction and renovation projects as well as the benchmarking of ongoing operational practices.	LEED is highly integrated with a range of environmental aspects including sites, water, air pollution and climate change, resource depletion etc.	There are no requirements for LEED compliance at airports in The Bahamas. A number of the prerequisites and points related to energy may be in conflict with other codes and standards. In particular, on-site generation may conflict with the Bahamas Electricity Act. **Recommendation**: Adopt proposed Guideline in **Appendix E** of this report

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
FAA Aviation Environmental Tool Suite	The FAA Environmental tool suite offers users a suite of models and analytical tools to address: • Noise • Dispersion modelling • Global emissions • Aviation environmental design tool • Environmental Design Space • Aviation portfolio management tool	The FAA tool is relevant to operational aspects of aircraft and ground support equipment.	This tool focuses on noise and local air pollution related to aircraft.	This document is not applicable to operations and activities at airport terminals. **Recommendation**: Adopt proposed HSE Standard in **Appendix D** of this report

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
Environmental regulations of The Bahamas, as well as of the local environmental background	The Ministry of the Environment and Housing under the direction of the Minister, the Hon. Kenred Dorsett, MP has responsibility for: • Bahamas Environment Science & Technology Commission (BEST) • Department of Environmental Health Services • Department of Housing	Environmental legislation may be relevant to new construction, renovations as determined by the permitting authorities.	Legislation in the Bahamas covers a number of environmental aspects including provisions for the protection of species and environmental health. However, the legislation is not well integrated with all environmental aspects.	Conformance to environmental legislation of The Bahamas is site-specific and based on project specifications. There is no environmental legislation which is specific to the operation and activities of airports in The Bahamas; however, in order to receive a building occupancy certificate compliance with WSC and BEC is required. In order to show compliance to Schedule 21 of the BASR, it is assumed that the Airport Planning guidance by ICAO Doc 9184 is followed. This Standard assumes compliance with local environmental regulations, especially in the context of liquid effluents and emissions (noise and air quality) as appropriate. **Recommendation**: Adopt proposed HSE Standard in **Appendix D** of this report

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation

Environmental Impact Assessment requirements by International Institutions and the Bahamas Environmental Science and Technology Commission (BEST)	Environmental Impact Assessment requirements follow guidelines developed by the BEST Commission. The terms of reference are determined on a project specific basis during initial consultation with BEST.
	
	International institutions such as the IADB, World Bank or other multilateral lending agency may provide specific requirements in the terms for loan agreements.
	
	General EIA Guidelines include:
	• Project Description
	• Alternatives, No-Action Alternative
	• Environmental Baseline Conditions
	  ○ Groundwater resources
	  ○ Waste Stream
	  ○ Utilities Required
	• Legal Aspects
	• Impact Analysis
	  ○ Hydrologic Impacts
	  ○ Waste Stream Impacts
	  ○ Utilities Impact Analysis
	• Environmental Mitigation
	• Environmental Management
	• Public Consultation
	• Recommendations
		The requirement for an EIA is project-specific and determined by the BEST Commission. A new aerodrome would require an EIA while building renovations would not.	The EIA itself is an integrated document that provides assessment of environmental aspects in the area of influence as identified in the agreed EIA terms of reference. The EIA identifies applicable legislation that comes under the direction of various Ministries.	As per Civil Aviation Safety Regulations, Schedule 21, Aerodrome Standards & Certification, Section 21.467: Application for Aerodrome Certificate identifies an EIA to accompany the application.
				
				An application for the issuance of an aerodrome certificate or an amendment thereto, shall be made in the form and manner prescribed by the Authority and accompanied by an environmental impact assessment report.
				
				Recommendation: Adopt proposed HSE Standard in **Appendix D** of this report

Environmental Aspects	21.015 COMMON	New aerodromes will require an	Legislation in the Bahamas	Schedule 21 is fully applicable to all

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
referenced in the Bahamas Civil Aviation (Safety) Regulation, 2001 (BASR) Schedule 21	REFERENCE SYSTEMS Aerodrome Design (h) The design of aerodromes should take into account, where appropriate, land-use and environmental control measures 21.440 REMOVAL OF CONTAMINANTS (f) Chemicals which may have harmful effects on aircraft or pavements, or chemicals which may have toxic effects on the aerodrome environment, shall not be used. 21.455 PROHIBITIONS IN CERTIFIED AERODROMES (4) Dump any waste matter whatsoever elsewhere other than a place designated and approved for the purpose by the aerodrome operator; (6) Spill or release substances capable of causing air, water, or soil pollution 21.467 APPLICATION FOR AERODROME CERTIFICATE (a) An application for the issuance of an aerodrome certificate or an amendment thereto, shall be made in the form and manner	environmental impact assessment report (EIA) per section 21.467 and consider appropriate "local" land-use and environmental control measures per section 21.015. Major aerodrome refit would require same as per new aerodromes. Minor renovations should consider at a minimum land-use and environmental control measures in the area of the project. Existing operations need to ensure the removal of any contaminants per section 21.440, the removal of any unauthorised waste or contaminants per section 21.455.	covers a number of environmental aspects including provisions for the protection of species and environmental health. However, the legislation is not well integrated with all environmental aspects. Environmental management will need to be fully integrated with the regulatory requirements of The Bahamas and ICAO standards. This includes integration in a proposed HSE Plan as well as within the SMS.	Certified Airports in The Bahamas It is recommended to adopt the proposed HSE Standard in **Appendix D** of this report, with the associated Guidelines in **Appendix E** A **wildlife management plan** will need to be prepared for each aerodrome and linked to their SMS.

Policy/Standard	Scope of Standard Related to Environment	Relevance to New construction/Projects Operations/ Divestiture	Integration with other Aspects	Applicability to Family Airport Facilities and Recommendation
	prescribed by the Authority. and accompanied by— (3) an environment impact assessment report 21.583 WILDLIFE HAZARD REDUCTION (a) Each applicant for an aerodrome operating certificate shall, where any wildlife presents a hazard to aircraft operations at the aerodrome, establish in areas within their authority an environmental management programme to minimize or eliminate such wildlife hazard which— (etc.)	New and Existing operations need to comply with the wildlife management plans (wildlife hazard reduction) requirements detailed in section 21.583. This plan forms an integral part of the SMS.		

6.2.5 Compliance with Environmental Regulatory Requirements of The Bahamas

Although the Certification framework recently established by BCAD under Schedule 21 is comprehensive and compatible with most International Best Practices (IBPs) in consideration of Environmental Protection goals, the Certification process and oversight by BCAD Inspectors for all Schedules of the BASR has not yet been implemented and the organisational structure to ensure compliance has yet to be formalized.

Key staffing requirements in support of the implementation of Environmental Management Programmes for Family Islands Airports include the designation of an Accountable Environment, Health & Safety (HSE) Manager representing all Family Islands Airports. It is proposed that an HSE Manager position be created for Tier 1 aerodromes, and that individual Airport Managers could implement Environmental initiatives at Tier 2 aerodromes. Environmental issues at Tier 3 aerodromes would be managed through the centralized Family Islands Airports HSE Manager.

7. ASSESSMENT OF CURRENT SITUATION AND APPROACH – AIRPORT EMERGENCY PLANS

7.1 INTRODUCTION AND CONTEXT

7.1.1 Report Objective

As part of the comprehensive program to modernize the institutional arrangements of the air transport sector for the Commonwealth of The Bahamas, the government has decided to address the fundamental changes necessary to improve emergency preparedness and response for the 28 Family Islands airports currently managed under the Bahamas Civil Aviation Department (BCAD).

Specifically, this report documents the current gaps to meeting international standards and industry best practices with respect to emergency preparedness and response for the Family Islands airports, and provides a template document for an implementable Airport Emergency Plan (AEP).

7.1.2 Reference Standards and Recommended Practices

In undertaking the gap analysis and the preparation of an AEP template document, the Consultant Team has relied upon the following reference standards and recommended practices:

- International Civil Aviation Organization (ICAO) - Annex 14 - Aerodromes, Volume 1 – Aerodrome Design and Operations, 6th Edition (July 2013);
- International Civil Aviation Organization (ICAO) - Annex 18 - The Safe Transport of Dangerous Goods by Air, 4th Edition (July 2011);
- International Civil Aviation Organization (ICAO) - Annex 19 – Safety Management, 1st Edition (November 2013);
- U.S. Federal Aviation Administration (FAA) – Advisory Circular 150/5200-31C, Airport Emergency Plan (6/19/2009);
- International Civil Aviation Organization (ICAO) – Doc. No. 9137 – Air Services Manual – Part 2 – Rescue and Fire Fighting, 3rd Edition (1990);
- International Civil Aviation Organization (ICAO) – Doc. No. 9137 – Air Services Manual – Part 7 – Airport Emergency Planning, 2nd Edition (1991);
- International Air Transport Association (IATA) – Airport Development Reference Manual, 10th Edition (2014);
- Bahamas Civil Aviation Safety Regulation - Schedule 21 - Aerodrome Certification and Operation; and

- National Fire Protection Association Codes and Standards.

Specifically, all assessments, analyses and documentation will be prepared on the basis of compliance with ICAO Annexes 14, 18 and 19, wherever reasonable and practical.

The structure and methodology of the AEP template documents will follow FAA Advisory Circular 150/5200-31C.

In the case of ICAO Annexes 14, 18 and 19, it should be noted that all recommendations stated in these documents are indeed recommendations and as stated in the annexes are "recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and which Contracting States will endeavour to conform in accordance with the Convention". It is at the discretion of the individual Member States whether to adopt these recommendations as a standard to be met by aerodromes.

7.2 AIRPORT SITE GAP ANALYSIS

7.2.1 Family Islands Airports Site Visits

In order to understand the current state of emergency preparedness and planning, site visits were undertaken to each of the 28 study airports, as well as consultations with BCAD and National Emergency Management Administration (NEMA) representatives and other stakeholders.

The purpose of the airport site visits was to gather information related to operations and emergency planning, training and preparedness in support of creating airport emergency and compliance plans for the 28 Family Islands airports. Some of the airports visited did not have a formal representative available to provide a briefing to our delegation, and as a result certain information and data was not able to be gathered.

7.2.2 Key Gap Analysis Findings

7.2.2.1 Introduce

Table 6 on the following page generally summarizes the keys findings from the airport site visits. Each category marked with an '✓' denotes that the specific area is functional, operational and/or appears to be compliant. 'NC' denotes that equipment was present on-site but was not found to be compliant.

7.2.2.2 Training

A significant part of emergency and compliance planning is proper training for personnel. Nearly all of the airport representatives interviewed stressed their desire for more certified training to support this.

During a meeting on February 27, 2014 with the NEMA Consultative Committee, they advised that they are pursuing more training in the coming one to two years, and this training will include a component covering Incident Command System (ICS). It was also suggested that media

training would be beneficial for the island administrators, as well as many of the airport managers.

Table 6: Airport Site Visit Summary of Findings

Airport Name	Findings by Category								
	Sched. Air Service	Critical Aircraft	ARFF Vehicle	Dry Chem. Caddy	Fire Extin-guisher	First Aid	Written Emerg. Plan	Training	Satellite Phone
Marsh Harbor	✓	ERJ140	✓		✓	✓	✓	✓	✓
Treasure Cay	✓	A320-200	✓		✓	✓			✓
Sandy Point		King Air		NC	✓				✓
Moores Island		King Air		✓	✓				
Great Harbor Cay	✓	G550	✓		✓	✓			
San Salvador	✓	A330-200	✓	✓	✓		✓	✓	
South Bimini	✓	G550	✓		✓				
New Port Nelson		King Air			✓				
San Andros Intl.	✓	Saab340B			✓				
Clarence A. Bain	✓	B1900		NC	NC		✓		
Congo Town	✓	Saab340B		✓					NC
New Bight	✓	DHC8-300	✓	✓	✓				NC
Staniel Cay	✓	B99		NC	✓				
Farmers Cay		C208		NC	NC				
Black Point	✓	C402		NC	NC				
Exuma Intl.	✓	ERJ190	✓	NC	✓	✓		✓	
Stella Maris	✓	BAE ATP			✓	✓			
Deadman's Cay	✓	Dash 8		✓	✓				✓
Mayaguana	✓	DHC8-300							
North Eleuthera	✓	B737-500	✓	✓	✓		✓	✓	NC
Governor's Harbour	✓	B737-800	✓	✓	✓				
Rock Sound	✓	B737-800	✓	✓	✓	NC			
Arthur's Town	✓	Saab340B			NC				
Matthew Town	✓	King Air	USCG	✓	✓				
Duncan Town		B737-800							

7.2.2.3 Emergency Preparedness Plans

BCAD has documented plans for each airport as to the organization, operation and emergency response structure. Unfortunately, the actual conditions at the airports, as we have discovered during our site visits, generally do not match the documented plans. In general at the Family Islands airports, resources are limited, response times can be lengthy, and there is a distinct lack of personnel training.

Few of the Family Islands airports had any type of emergency preparedness plans which we were able to obtain and review. The only exception to this was Marsh Harbour International. It is understood that the emergency preparedness plan for Marsh Harbour was prepared using a template supplied by NEMA; however, we were not able to confirm this.

7.2.2.4 Medical and Air Ambulance Services

The Health and Human Services Administration was asked to confirm medical resources for each island. At a minimum, each island has a medical clinic, and all clinics have at least one nurse on staff. Most have one doctor assigned for the island, though some do not.

Many of the islands are dependent on air ambulance services to airlift injured persons to larger facilities, either in Freeport, Nassau, or the U.S. The Bahamas have one air ambulance service comprised of two aircraft, a Super King Air 200 and a King Air 90. Additional air ambulance aircraft support is typically secured from the U.S.

7.2.2.5 Findings for Select Family Islands Airports

Marsh Harbour International Airport (MYAM)

Marsh Harbor International Airport (MYAM) is expanding to meet demand from current and future tourism growth. MYAM has a new terminal building under construction which is anticipated to be completed and operational by late 2014. Marsh Harbor is the third busiest airport after Freeport and Nassau, serving approximately 500,000 passengers a year with daily commercial services.

The MYAM Airport Manager has participated in an emergency table top exercise conducted at Treasure Cay in 2006. The exercise included hotels, mutual aid representatives, a priest and pastors, and airport personnel.

The Consultant Team spoke to the MYAM Airport Manager regarding the procedures that they would follow in the event of an aircraft accident. Following an aircraft accident, the MYAM Airport Manager would broadcast on the Unicom that the airport is closed and request a response. If he/she is not on site then they would be notified via cell phone. The Airport Manager would then contact the Island Administrator. (Most of the other Family Islands airport personnel identified a similar communication path of notifying the Administrator and Police.) In addition, there are a number of volunteers in the area who would respond to the event.

MYAM has had fatal accidents. One of the worst was a Lear jet crash in 2001 which resulted in nine persons perishing. There was a large media response because of one of the victims was an

American celebrity. During that event, airport Rescue and Fire Fighting Services (RFFS) formed a boundary around the crash site, with the assistance of police, however it was extremely dark and no auxiliary lighting was available.

It is estimated that the airport has had at least one accident or incident annually but usually without any fatalities. In most cases, the Airport Manager serves as the Incident Commander near the scene with RFFS in charge of the tactical needs followed by police for the investigatory process. The personnel generally believe that they are well trained and have planned for security emergencies but they would like more classroom training for other types of emergencies.

South Bimini Airport (MYBS)

South Bimini Airport (MYBS) is undergoing expansion funded through private resources associated with tourist development on the island. There is a great deal of work being undertaken to improve safety of the runway and taxiway surfaces, as well as the landing strips. However, there does not seem to be a focus on emergency response infrastructure in support of the physical infrastructure upgrades. The airport has one fire truck and three spare extinguisher caddies carrying approximately 2,500 gallons of dry agent. The fire truck carries approximately 5,000 gallons of water. There is no triage apparatus or medical support, the airport personnel have very limited emergency training or there is no documented emergency plan.

Great Harbour Cay Airport (MYGS)

The Great Harbour Cay Airport (MYGS) in the Berry Islands has shown great initiative given the lack of resources they have. The airport is a port of entry and airport management wishes to grow their passenger traffic. The airport staff have designed a home-built fire response vehicle they call "Marty". The vehicle is capable of carrying two 2,000 gallon water tanks but no foam. The airport also has another vehicle capable of responding to an incident/accident and towing another 2,000 gallon water tank. They also have pressurized dry chemical on the aprons that are checked regularly for operational compliance. The MYGS Airport Manager would likely receive the call upon an accident occurring and would immediately contact the police and fire department to respond.

The airport staff would like the airport to have on-field fire personnel. They do not have a written emergency plan but would like one, as well as training for the airport manager and select staff. The airport manager believes that quarterly table top exercises would be quite valuable to discuss who would do what during a given event.

Overall the vast majority of the airports do not have any structured response plans. In spite of this, most airport personnel expressed the belief that they know what to do if something happens. Many have had some kind of accident response with or without fatalities. Those that have operational dry chemical hand caddies believe someone could wheel it to the crash site. Realistically the distances that the caddies would need to be wheeled would be difficult to manage on foot in a timely manner, which may render them useless in protecting life or property.

7.2.3 Preliminary Findings

Based on the airport site visits and consultations, the following are the Consultant Team's key preliminary findings and compliance gaps:

- Lack of any (documented) training regarding emergency preparedness and response;
- Lack of any (documented) media management training;
- Lack of site specific written plans pertaining to emergency response;
- Lack of or inadequate personnel resources;
- Lack of or inadequate Aircraft Rescue Fire Fighting (ARFF) equipment;
- Minimal fire extinguishers and/or hand caddies that are compliant (with NFPA);
- Lack of or inadequate medical aid/triage equipment and associated training;
- Lack of or inadequate integrated communications plans;
- Lack of or inadequate transport plans and/or resources besides medevac;
- Lack of or inadequate ability/resources to maintain the airfield in a safe manner or restore it to operational readiness after an occurrence;
- Lack of site specific disabled aircraft removal plans;
- Lack of or inadequate documentation; and
- A culture of acceptance to the above.

In order for BCAD to improve on its planning, a strong cultural shift will need to begin. Changing culture can be difficult and often takes many years to see results. Nearly all the airport personnel interviewed advised that they would like to receive more training and that they critically require more resources.

NEMA and BCAD have recently put a plan in place to increase training for some of the Island Administrators. This is a positive first step, but may not specifically alter the culture of personnel working within the airport environments. BCAD and NEMA have emergency plans which on paper seem adequate, inclusive of training, health and human service response and search and rescue programs. Unfortunately, these plans do not necessarily translate in a timely and effective manner to each of the Family Islands airports.

Most airport personnel feel a sense of isolation from BCAD and NEMA in Nassau. In order to ensure future compliance with ICAO standards, it will be important for BCAD and NEMA to understand and address the disconnect that many of the Family Islands airports personnel identify with.

7.3 RISK AND VULNERABILITY ASSESSMENT

It is assumed that the Tier 1 Family Islands Airports, being the busiest in terms of aircraft and/or passenger movements, will be the most at risk of experiencing an emergency event. While the

majority of the Tier 1 airports have more resources than others to deal with emergencies, the gap between being compliant and not is still quite great. The Bahamas compete with a number of Caribbean island destinations and providing safe airport operational environments for scheduled air carriers, and charter and general aviation aircraft is critical to maintaining and attracting tourism activity. A major accident at any of the Family Islands airports could significantly hinder tourism activity if the airport's condition or lack of adequate response is named as a contributing factor(s).

While the larger (Tier 1) Family Islands airports may be at a higher risk by virtue of the volume of aircraft movements and passengers, the smaller airports pose a different vulnerability and risk whereby they may have more egregious compliance gaps or deficiencies. These gaps or deficiencies themselves may contribute to an accident occurring or increasing the severity of the outcome. It is therefore imperative that BCAD not only implement the required emergency response plans and resources, but address the safety-related compliance gaps or deficiencies in order to reduce the airport's risk and vulnerability profile.

7.4 AIRPORT EMERGENCY PREPAREDNESS PLANS

7.4.1 Approach to Development of the AEPP

The development of Airport Emergency Preparedness Plans (AEPP) for the Family Islands Airports needs to involve a collaborative effort between airport management, the resident stakeholders inclusive of tenants and mutual aid (external) responders and those who will have to execute the plan.

The objective of emergency planning is to minimize the effects of an emergency, particularly with regard to saving lives, protecting property and minimizing the impact on aircraft operations. The AEPP needs to outline the procedures for coordinating the response of different agencies, or services, and those agencies in the surrounding community that could be of assistance in responding to the emergency.

The process of developing an AEPP needs to be tailored to meet the specific needs of each airport, regardless of size, and needs to consider the resources that are readily available at the specific airport and the local community, as well as the capabilities of the persons involved. The AEPP should build on what exists in the surrounding communities and from critiques gathered during drills and exercises, as well as debriefs following actual emergency accidents and incidents.

Successful emergency management processes are not based on a static plan but adopt a continuous cycle of:

(i) Prevention & Mitigation,

(ii) Preparedness,

(iii) Response, and

(iv) Recovery.

Therefore, the AEPP must be a living (dynamic) document that is continuously being reviewed and updated to reflect a changing environment (or risks), lessons learned from incidents/events and improvements in practices. Refer to **Figure 1** further in this section.

AEPPs should stress the use of an organisation that meets the intent and general structure of the Incident Command System (ICS) structure, which is part of the North American National Incident Management System (NIMS) and has become an integral part of the FAA's Advisory Circular (AC) 150/5200-31C.

It is generally agreed that because airports rely upon external resources when an incident or event outstrips their ability to manage it on their own (indeed - for smaller airports this is the situation for nearly all incidents), it is important that airports and their regional disaster response partners, coordinated by NEMA, share a similar preparedness platform. Assets such as the Bahamas Red Cross, island medical clinics, police and fire fighting services and volunteer organizations, as well as other sources of aid typically respond from outside the airport when they are needed. It is important to coordinate these assets under one common organization structure such as an ICS.

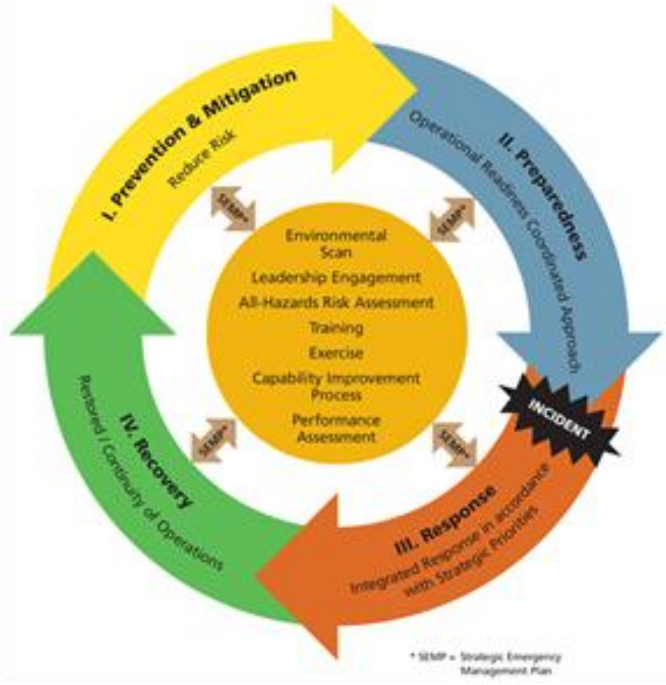

Figure 1- Emergency Management Process

In order to facilitate coordinated response among the critical stakeholders and to minimize disruptions of neighbouring communities, airports have an interest in connecting their tactical response planning with the plans that mutual aid organizations have in place. Additionally, when considering a regional disaster response, such as a natural disaster, the airport serving that region may generally play a significant role in supporting the regional response assets that flow toward the incident. Even if airports are not managing overall incident response themselves,

they should be aware of how arriving assistance is being managed. This is especially true for air ambulance services and supplies by air which are being coordinated for a specific island whereby the airport's coordination and participation is critical.

Utilizing an ICS system means incorporating key words into emergency planning:

- Command, on-scene, immediate, tactical, short-range, and common terminology;
- Personnel management system used at the incident scene and command post by each of the respective first responder agencies and some secondary responders;
- Establishes single command point and defines responder responsibilities;
- Uses an organization matrix with common terminology and lines of communication and authority;
- Focused on responding to the immediate situation and bringing it under control; and
- The command lead can remain flexible and choose to shift from one agency to another as the incident progresses through stages.

An ICS system is considered the gold standard for incident command and control.

NIMS/ICS at airports is outlined in the FAA's Advisory Circular 150/5200-13C and depicted on **Figure 2** below. Migrating an airport organization to that end requires commitment and direction from the Airport management and/or Island Administrator, with an understanding that with the responsibility comes the role of an accountable authority. Developing a robust and capable NIMS/ICS organization is best served by an organized effort that involves all airport stakeholders whereby each understands the roles and responsibilities and is supported by training, certification, and practice. In the case of many of the Bahamas' Family Islands airports, there is limited staff and ICS structure roles should be seen as tasks more than an individual assignment.

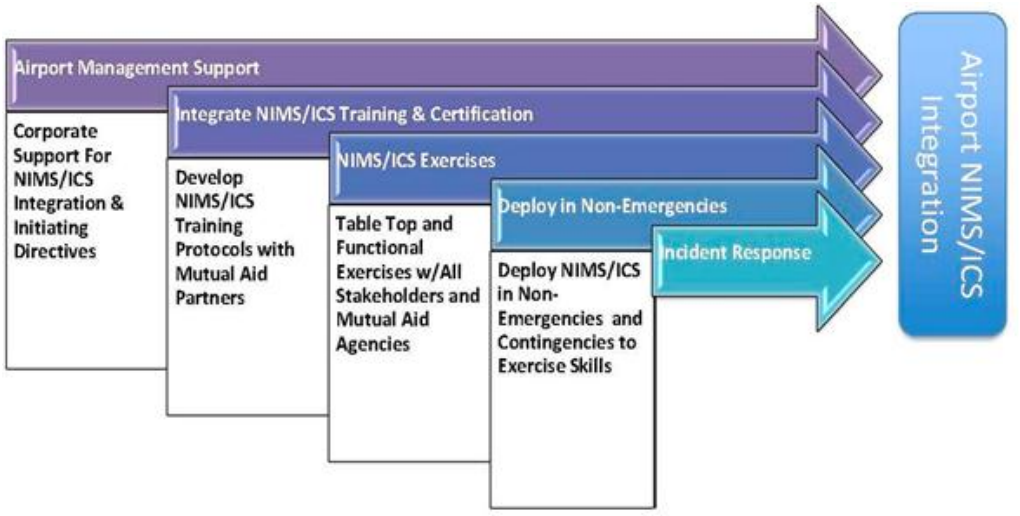

Figure 2 - Integration Model for Airport NIMS/ICS

Command Post (CP) organization charts for various events including the nine emergencies outlined in the AC 150/5200-31C.

1. Aircraft accident;
2. Terrorism incidents;
3. Structural and fuel farm fires;
4. Natural disasters;
5. Hazardous materials;
6. Sabotage/hijack;
7. Power failure for movement area lighting;
8. Water rescue; and
9. Crowd control.

Each of these events will have a template ICS structure developed for the airports to utilize. The flexibility of the NIMS/ICS model allows for establishing a command structure that makes sense to the event at hand. The other tool inclusive of the AEPP will be checklists to help responders assimilate to the role they are assigned within the structure.

7.4.2 Specific Airport Emergency Preparedness Plans

Airport Preparedness Plans (AEPPs) have been prepared for each of the 28 Family Islands Airports which are presented under a separate cover. The AEPPs have generally been structured upon the FAA Advisory Circular 150/5200-13C and attempts to be as compliant with the relevant standards and recommended practices contained in ICAO Annexes 14, 18 and 19, as is reasonable and practicable for the Family Islands Airports. However, they will need to comply with BCAD standards that should be updated to reference the new Annex 19, which may or may not specifically follow all ICAO standards and recommended practices. Where applicable and feasible, we have also incorporated into the AEPPs other industry best practices relating to emergency preparedness and response.

It should be noted that although compliance to all applicable ICAO standards and recommended practices remains the foundation upon which Member State's safety programmes are established, there is an element of risk management inherent in the new ICAO Annex 19 (safety management provisions previously contained in six different annexes now transferred or duplicated) that can be applied, as well as a process for the "Notification of differences" to Annex 19, if any.

Each AEPP has been tailored to reflect the size, scale, resources and hazards specific to the airport. The various sections of each AEPP have been populated with information gathered during the research phase of this assignment. However, there were instances where the Consultant Team were not met by airport representatives to answer questions and specific information was not made available. For these reasons, each AEPP has areas highlighted where

information must still be included during the implementation phase. In some cases, the information has been added but needs to be verified and in other cases it still remains to be populated. The following generally summarizes the information still to be inserted or populated in the AEPP documents:

1. Regular or most common aircraft types serving the airports. (Critical aircraft information which defines the ARFF category has been captured. Other aircraft operations will need to be updated annually.)
2. Medical clinic information needs to be verified.
3. Physical location of the Island Administrator's EOC needs to be identified.
4. Mutual aid response support for each island/airport needs to be identified.
5. Key telephone numbers are to be inserted.
6. Airport hours of operation for each airport are to be inserted.
7. Hours of Air Traffic Control, if applicable, for each airport are to be inserted.
8. Hours and staffing levels for all ARFF operations are to be inserted.
9. Hours and staff levels for Police are not known for each airport.
10. Hours and contact information for airport operations/manager for each airport are to be inserted.
11. The availability of airport emergency backup power is not known for each airport.
12. Public and alert emergency notification information needs to be clarified.

Each of the "emergency" sections of the AEP related to Sensitive Security Information (SSI) such as bomb threats, sabotage and hijacking reference the Airport Security Plan (ASP). These sections have high level information and organization charts for response but do not contain specific response criteria that could be compromised. This will allow BCAD to distribute the AEPPs without SSI restrictions to document sharing and retention.

7.5 EMERGENCY PREPAREDNESS IMPLEMENTATION

The following section is intended to provide a high-level outline of the requirements and challenges which BCAD will need to face in order to implement not only the new AEPP but also the resources and equipment necessary to put the plan into action.

7.5.1 Preliminary Implementation Approach

In order to not overwhelm personnel, improvements need to start with some general basics. Personnel who can start achieving small rewards at a time will begin to feel more confident and increase cultural awareness of their role in helping to minimize the loss of life or property when an emergency takes place.

The initial steps may include the delivery of train-the-trainer courses for airport administrator's or designee disciplines, such as firefighters, police and/or airport managers. Train-the-trainer courses provide for continued improvements within the islands and the ability for on-site trainers to build competent personnel resources maximizing the number of people who are qualified to respond. Training and response procedures should have a structure to it such as that of an Incident Command System (ICS) which is outlined through the Federal Aviation Administration's (FAA) Advisory Circular 150/5200-31C. Train the trainer courses should also include media training. If a large event should occur media persons will likely try to discuss the event with anyone they see at the scene and therefore all personnel involved in the response should have some high level of training especially for sensitive issues like mentioning victim names or medical status.

The train-the-trainer course should include:

- Basic training in firefighting equipment, trucks and/or fire extinguishers and basic first aid;
- Basic training in airfield safety including lighting, marking, signage and safety areas/runway strips;
- Basic media management training;
- Establishment of helicopter landing zones;
- Basic triage principles, especially when no qualified medical personnel is available;
- Basic radio communication procedures; and
- Introduction to CISM (Critical Incident Stress Management) principles.

Other emergency preparedness resources should include:

- A documented and updated list of resources including personnel and phone numbers on airport or on the island of who can respond and what their functions might be. This needs to be updated semi-annually and shared with BCAD and NEMA.
- Organization charts and checklists readily available and specific to the types of emergencies/events that are likely to occur such as aircraft accident, hurricane, fires, floods and others the region are vulnerable to.
- Operational resources so they have adequate working tools.
- Regular table top exercises beginning with simple scenarios and working toward more complex ones.

In order for the above initial steps to be instituted, the airports will need to have operating budgets available to maintain the minimum adequate resources. The current culture of the Family Islands to a great degree is a resolve that they do not have the proper resources so they will do what they can with what they have. Still others believe that they do not have the skills and training to contribute to an incident/event and this has become accepted thinking.

There appears to be a lack of confidence among current airport personnel that BCAD or any another entity will provide the resources that are necessary within a reasonable period of time.

Independence from the need to depend on basic resources coming from higher levels in Nassau during a crisis will help build confidence and create greater pride in the ability to decrease loss of life or property damage during an event. These changes can undoubtedly help to shift culture over time.

7.5.2 BCAD Support Requirements

BCAD needs to be committed to the success of emergency programs and provide timely support for each Family Islands airport and the specific administrator.

The following steps may ensure improvements towards compliance without overwhelming personnel:

- Basic training for island administrators, police, fire and airport management in ICS Introductory level;
- Basic firefighting training for RFFS/fire;
- Basic EMT training for RFFS/fire/police;
- Basic investigation and scene security training for police;
- PIO training for island administrators and airport managers;
- Customize the AEPP template to contain specific information pertinent to their airport; and
- Develop an emergency response committee for each island which the administrator chairs.

The emergency response committee should determine a list of critical resources they currently have and make requests to BCAD to supply those that are missing. The critical resources list should include as a minimum:

- ARFF equipment to support aircraft operations outlined in the established category for their airport (and as discussed further in Section 5);
- Extinguishers that are operational (i.e. charged and unexpired) and inspected regularly;
- Vehicles or carts with a trailer for hauling supplies out to an incident/accident;
- First aid supplies adequate for the aircraft passenger count that operates on at least a semi-regular basis;
- Loud speakers and bullhorns;
- Portable lights;
- Non-potable water supply; and
- Operable satellite phones.

The AEPPs are quite robust compared to the current status of response capabilities. Expectations for meeting the AEPP requirements should be gradually introduced over time. The responders must adapt to basic functions first including:

- Filling in information pertinent to their airport in the AEP
- Updating information annually
- Familiarization with ICS organization charts, decide ahead of time who may wear a particular "hat" in the ICS chart
- Familiarization with checklists specific to each hazard
- Practice using the AEP tools as often as possible, at least once annually
- Develop a communications plan with contact information for each mutual aid responder.
- Develop a list of vendors on the island that may have equipment such as generators, light plants, temporary storage or heavy equipment for example.
- Conduct after action reviews and implement new procedures based on review outcomes.

The Basic Plan section should be the first portion of the AEPP that Administrators become familiar with. Once familiar with the Basic Plan, they should approach the functional annexes one chapter at a time. Finally, the hazard specific sections should then be modified to reflect the capabilities of each airport.

This approach may take as many as five (5) years or more to achieve full competence with the AEPP but it is important that individuals not overwhelm themselves as that may lead to a sense of failure. Responders should be recognized for their efforts and awarded a certificate or placard identifying their training successes.

Lastly, each airport should have their own assigned operating budget to include funds to cover the minimum emergency response resources.

8.0 INSTITUTIONAL ANALYSIS – AVIATION SAFETY, ENVIRONMENT, HEALTH & SAFETY

The Bahamas Civil Aviation Department's approach to managing aviation safety, environment, health & safety at the Family Islands Airports has been informal to date. Certain airports had an identified Airport Manager that would ensure aviation safety was respected based on a range of Civil Aviation training and experience. There was a noticeable emphasis of airport management that was security-centric. This culture, although important in the management of airport security, left the management of other issues fall short when it came to safety as detailed by the ICAO Standards as well as HSE in comparison to existing regulations and international best practices.

8.1 ANALYSIS OF CURRENT FRAMEWORKS

8.1.1 Aviation Safety Framework

The core of aerodrome requirements in regards to aviation safety can be found in the new Schedule 21 under the BASR. This schedule puts in place the requirements for certified aerodromes to manage aviation safety in accordance with ICAO Standards (Annex 14 and Annex 19). The Family Islands Airports do not currently follow the requirements established in the multiple BASR Schedules with safety requirements, including the need for each certified aerodrome to have an Airport Manual. BCAD has recently trained inspectors that will have an oversight role to play in the certification and quality assurance function for Family Islands Airports; however, these inspectors have yet to exercise their roles and their specific duties and responsibilities are yet to be determined. At the aerodrome level, there has been no training or communication of expectations for BASR Schedule compliance as it relates to safety.

BCAD has also recently put in place (September 2011) a State Safety Programme (SSP) that meets the intent of ICAO SARPs; however, the SSP has yet to be implemented and most of the commitments made in the Safety Policy Statement have yet to be put in place. This includes the determination of the Acceptable Level of Safety for BCAD-managed aerodromes and the establishment of a personnel structure to ensure the implementation of the Programme.

There is currently no personnel structure in place within Civil Aviation and the Family Islands Airports to manage aviation safety in accordance with the ICAO framework. There is also a total gap in personnel training on SMS at all levels of the organisation.

8.1.2 HSE Framework

The Government of The Bahamas, with funding from the Global Environment Facility and assistance from the United Nations, produced a 2005 National Capacity Needs Self-Assessment by SENES Consultants Limited to identify The Bahamas' capacity to implement international

conventions relating to the environment. The results of this assessment were collated to produce the Bahamas National Environmental Management Action Plan.

Since 2005, few of the recommendations have been implemented, and new legislation introduced, namely the Subdivision and Planning Act 2010 and Forestry Act 2010, lack regulations for enforcement. Of note was the recommended creation of a Ministry of Energy and Environment charged with environmental stewardship. Currently The Bahamas have a Ministry of Environment and Housing.

Part of the needs self-assessment was to determine how best to enhance the country's capacity to meet its commitments to implement the convention and address other priority environmental issues. The most critical needs were identified and presented at three levels: Systematic, Institutional, and Individual. These are outlined below.

Systematic Level. At the systematic level, recommendations largely pertain to implementing and strengthening legislation for environmental management and monitoring. Such recommendations included:

1. Strengthening legislation and policy;
2. Improvement to governance structure to generate decision-making at the Cabinet;
3. Programme activity architecture for environmental management; and
4. Dedication and allocation of human and financial resources for environmental management.

Institutional Level. At the institutional level, recommendations focused heavily on organisational responsibility and human capacity. These recommendations included:

1. Establishing clear accountabilities;
2. Equipment and monitoring allocations;
3. Operational policies and guides for staff;
4. Training programmes in environmental management; and
5. Geo-referenced data.

Individual Level. At the individual level recommendations were based on staff accountability and training.

There is currently no personnel structure in place within Civil Aviation and the Family Islands Airports to manage HSE issues in compliance with regulatory requirements established in existing environmental and health & safety Acts and international best practices. There is also a total gap in personnel training on HSE management at all levels of the organisation.

Based on Stantec's review of the current environmental legislative requirements of The Bahamas, it was also noted that there is an opportunity to strengthen management of activities related to halocarbons (ozone depleting substances and greenhouse gas contributors), special waste management, and stormwater management. The absence of any regulations or reference to these issues in the existing institutional framework was a gap that Stantec believes

should be addressed at a national level. Environmental guidelines have been proposed in **Appendix E** of this report. These guidelines address these issues in a responsible environmental management approach that support sustainability initiatives.

8.2 GENERAL COMPLIANCE OBSERVATIONS TO THE BASR SCHEDULES

As published in the BCAD Advisory Circular AC-01-002 (March 31, 2013), Introduction to the Bahamas Aviation Safety Regulation, the Bahamas Aviation Regulations are:

- ICAO-based;
- Edited to assign personal responsibility for compliance with applicable requirements;
- Edited to avoid the excess repetition of the same requirement found in multiple locations in the Annexes;
- Edited to include additional requirements that were determined to be relevant international requirements;
- Developed as a consolidated body of regulations applicable to flight safety standards; and
- Organised into "books" to group the requirements pertinent to specific technical users.

The BASR's main intent is to provide a regulatory framework for Civil Aviation to holistically manage aviation safety. The Regulations are structured in the following manner:

- Part I - Enforcement of these Regulations
- Part II - Flight Standards Inspectorate
- Part III - Reports, Documents and Records
- Part IV - Registration and Marking of Aircraft
- Part V - Airworthiness of Aircraft
- Part VI - Aircraft Instruments and Equipment
- Part VII - Personnel Licensing
- Part VIII - Operations of Aircraft
- Part IX - Aerial Work Operations
- Part X - Commercial Air Transport Operations
- Part XI - Carriage of Dangerous Goods
- Part XII - General
- Schedules

The concept of the organisation of the Schedules ("books") for the users makes it possible for them to easily consult the regulations that apply to their technical specialties and organisations. For example:

- The primary requirements for maintenance personnel are located in Schedule 5.
- The primary requirements for management of an approved maintenance organisation are located in Schedule 6.
- The primary requirements that apply to all operations of aircraft by pilots are located in Schedule 10.

- The primary requirements for management of an air operator are located in Schedule 12.
- The primary requirements for cabin crew members are located in Schedule 13.
- The primary requirements for managers of training and instructors are located in Schedule 14.
- The primary requirements for aerodromes are located in Schedule 21.

The "Parts" of the BASR that have the most direct application to aerodrome operations and this consultancy (which includes all four Task Reports by Stantec) are as follows:

- Part I (Enforcement of these Regulations) of the BASR states that for the purposes of the Civil Aviation Act and of the BASR, the provisions of the Convention on International Civil Aviation signed at Chicago on December 7, 1944, ("the Chicago Convention") and the Annexes, together with the Standards and Recommended Practices (SARPs) established by ICAO thereunder and such other internationally recognised standards and practices, shall be adopted and applied (as appropriate) in The Bahamas.
- Part III (Reports, Documents and Records) of the BASR provides requirements for mandatory reporting, documents to be carried, the preservation of documents, and offences in relation to documents and records. These clauses have a direct application the reports and records required of the SMS.
- Part XI (Carriage of Dangerous Goods) deals mainly with the shipping and acceptance of dangerous goods for and by air carriers and operators. The Stantec Task 3 Report provides a framework for Family Islands Airports aerodromes to deal with dangerous goods in collaboration with operators and carriers as an oversight function in order to comply with Section 78. (1) of the BASR that states "*No person may ship, caused to be shipped, accept for shipment or allow to be carried on an aircraft any article or substance that may be dangerous goods except they have been prescribed by the Minister in Schedule 18 of these Regulations*".
- Part XII (General) provides for the requirements associated with accident reporting and investigation that will be included by reference in the SMS.

Table 7 and **Table 8** below provide a summary of the observation of general compliance or relevance to aerodrome operations for the Schedules of the BASR.

Table 7: Summary of Schedules Currently Referenced in the BASR, 2001

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 1	General Policies, Procedures & Definitions **NOTE**: *The Appendix*	**1.001 APPLICABILITY** (a) This Schedule prescribes requirements of the Bahamas that are applicable to the structure and processes of all Schedules of the Civil Aviation Safety Regulations. (b) This grouping of Schedules include— (21) Schedule 21: Aerodrome Standards & Certification	Not observed (SMS)

Schedule	Purpose	Applicability	Observed/ Not Observed
	provides a full list of definitions and acronyms that should be compatible with any such listing in individual Task Reports	(c) Each Schedule of these Civil Aviation Safety Regulations provides specific technical safety requirements prescribed by the appropriate authorities in support of the Civil Aviation Act and supporting legislation to ensure that individuals, organisations and other entities under the oversight of the Bahamas are in compliance with the international standards for aviation safety. (b) Where found in these Schedules, the term "**the Authority**" indicates the Civil Aviation Department of the Bahamas (BCAD). **1.310 POWERS OF AUTHORISED PERSONS** (a) An authorised person has the power as delegated by the Authority to— (1) Carry out audits or surveillance activities; (2) Enter and inspect any aerodrome, hanger or other place (at which an aircraft is located or stored), aircraft or any organisation performing tasks and services related to aviation safety; **1.375 SAFETY MANAGEMENT SYSTEM IMPLEMENTATION REQUIRED** (a) The following organisations shall implement a Safety Management System (SMS) in support of the State Safety Programme of The Bahamas— (6) Operators of aerodromes certificated in accordance with Schedule 21; **1.380 SAFETY MANAGEMENT SYSTEM FRAMEWORK** (a) The SMS of a service provider shall— (1) Be established in accordance with the framework elements outlined in Appendix 1 through 5 of 1.380; and (2) Be commensurate with the size of services. (b) The Authority may approve a waiver of some requirements of this framework appropriate to the size and complexity of the organisation, but all SMS shall, as a minimum, include— (1) A process to identify actual and potential safety hazards and assess the associated risks; (2) A process to develop and implement remedial action necessary to maintain an acceptable level of safety; and (3) Provision for continuous monitoring and regular assessment of the appropriateness and effectiveness of safety management activities	

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 2	PENALTIES PROVISIONS REFERRED TO IN REGULATION 9.(5) PART B: PROVISIONS REFERRED TO IN REGULATION 9.(6)	5 Failure to comply with direction given under the regulations 15(7) Intentional obstruction or impedance of authorised person 16(2)(a) Failure to grant access to an aerodrome 22 Failure to preserve documents 50 Careless or reckless actions 80(1) Failure to make an accident report 80(3) Failure to cooperate with an accident investigation 15(2) False statement 20(5) False report 23(2) Intentional alteration, damage, or destroying of document 23(2) False entries in documents 78 Unauthorised shipment or carriage of dangerous goods 80(2) False report regarding accident	N/A
Schedule 3	Aircraft Registration	**3.001 APPLICABILITY** (a) This Schedule prescribes the requirements of the Bahamas for registration and marking of civil aircraft. (b) This Schedule is applicable to owners, lessees and operators of aircraft registered in the Bahamas.	N/A
Schedule 4	Aircraft and Component Original Certification	**4.001 APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for the— (1) Aircraft type-certificate and supplemental type certificate standards that will be applied during the issuance and renewal of airworthiness certificates, and (2) Designation of applicable rules for original certification of aircraft and components. (b) This Schedule is applicable to the owners and operators of aircraft registered in The Bahamas and the persons and organisations that maintain these aircraft.	N/A
Schedule 5	Continuing Airworthiness of Aircraft	**5.001 APPLICABILITY** (a) This Schedule prescribes the requirements for— (1) Certification of aircraft and aeronautical components; (2) Issuance of Airworthiness Certificates and other certifications for aeronautical products; (3) Continued airworthiness of aircraft and aeronautical components; (4) Rebuilding and modifications of aircraft and aeronautical components; (5) Maintenance and preventive maintenance of aircraft and aeronautical components;	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
		(6) Aircraft inspection requirements; and (7) Air operator aircraft maintenance and inspection requirements. (b) This Schedule is applicable to the owners and operators of aircraft registered in The Bahamas and the persons and organisations that provide maintenance services for these aircraft.	
Schedule 6	Approved Maintenance Organisations	**6.001 APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for— (1) Issuance of approvals to organisations for the maintenance. preventive maintenance, and modifications of aircraft and aircraft components; and (2) The certification and general operating rules for an Approved Maintenance Organisation (AMO). (b) This Schedule is applicable to the organisations approved to perform maintenance and the persons working for those organisations that provide maintenance services for aircraft registered in The Bahamas.	N/A
Schedule 7	Required Instruments and Equipment	**7.001 APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for the aircraft instruments and equipment applicable to— (1) All domestic and international flight operations of Bahamas-registered aircraft; (2) All aircraft operated in commercial air transport by the holder of an Air Operator Certificate issued by The Bahamas; and (3) Operations of aircraft from other ICAO Contracting States within The Bahamas. (b) This Schedule is applicable to all owners, operators and flight crew of aircraft registered in The Bahamas and the persons and organisations that provide maintenance services for those aircraft.	N/A
Schedule 8	Personnel Licensing	**8.001 APPLICABILITY** (a) This Schedule prescribes the— (1) Requirements for issuing airman licenses, and ratings; and authorisations to those licenses, as applicable (**APPLIES TO AIR TRAFFIC CONTROLLERS**); (2) Conditions under which those licenses, ratings, and authorisations are necessary; and (3) Privileges and limitations of holders of those licenses, ratings, and authorisations. (4) Medical standards and certification procedures of the Bahamas for medical assessment and issuance of medical	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
		certificates. (b) This Schedule is applicable to all persons— (1) Seeking licences under the civil aviation regulations of the Bahamas and the persons and organisations that provide and supervise the required training, experience and authorisations; (2) Holding licences issued by The Bahamas for which medical certificates are required for the validity of the licence; and (3) Providing medical evaluations, accredited medical conclusions, and special evaluations for operational competency.	
Schedule 9	Approved Training Organisations	**9.001 APPLICABILITY** (a) This Schedule prescribes the requirements of the Bahamas for— (1) Obtaining approval for the conduct of required aviation training by organisations; and (2) Maintaining and amending the basis for that approval. (b) This Schedule is applicable to— (1) Persons seeking licences under the aviation regulations of The Bahamas; (2) Organisations that provide the required training and qualification of aviation personnel; and (3) Persons that administer the required training and qualification on behalf of the organisations. **9.295 AERODROME REQUIREMENTS** (a) The ATO holder of Level 1 authority shall maintain continuous use of each aerodrome at which training flights originate, and that the aerodrome has an adequate runway and the necessary equipment. Note: See Appendix 1 to 9.295 for specific runway and equipment requirements. Details provided in **APPENDIX 1 TO 9.295**: AERODROME REQUIREMENTS	N/A
Schedule 10	Operations of Aircraft	**10.001 APPLICABILITY** (a) This Schedule prescribes the requirements for— (1) Operations conducted by airman licensed in The Bahamas while operating aircraft registered in The Bahamas. (2) Operations of foreign registered aircraft by Bahamas AOC holders. (b) This Schedule is applicable to operators of aircraft in— (1) Aerial work; (2) Commercial air transport; or	Aerodrome **Certificates** and Restrictions per **10.482** were not observed or respected.

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 10	Operations of Aircraft	(3) General aviation. (c) This Schedule is applicable to pilots and other persons performing duties required by these regulations. (d) For operations outside of The Bahamas, all Bahamas pilots and operators shall comply with these requirements unless compliance would result in a violation of the laws of the foreign State in which the operation is conducted. (e) Where a particular requirement is applicable only to a particular segment of aviation operations, it will be identified by a reference to those particular operations, such as "commercial air transport" or "small non turbojet aeroplanes." **10.282 CARRIAGE OF DANGEROUS GOODS** (a) No person shall load or cause to load any goods on an aircraft which that person knows or ought to know or suspect to be dangerous goods, unless this act is in conformance with the requirements of Schedule 18 regarding carriage of dangerous goods by air. (b) No person shall carry dangerous goods unless the details of that information are included in the flight plan and proper notification has been made to both the appropriate authorities at the intermediate and destination **aerodromes**. (c) No person shall carry dangerous goods in an aircraft registered in The Bahamas or operated in The Bahamas except— (1) With the written permission of the Authority and in accordance with the regulations and/or conditions set by the Authority in granting such permission; and (2) In accordance with the Technical Instructions for the Safe Transport of Dangerous Goods by Air issued by the Council of International Civil Aviation Organisation and with any variations to those instructions that the Authority may from time to time mandate and provide notification of to ICAO. **10.482 TAKEOFF & LANDING** (a) No person shall cause an aircraft to take-off or land at an aerodrome or heliport within The Bahamas that is **not licensed by the Government or a Government aerodrome for which permission for use has been received**, if the purpose of the flight operation is— (1) Commercial air transport with passengers, (2) Flight instruction. (b) **No person shall cause an aircraft to take-offs or land at an aerodrome or heliport at night within the Bahamas for the purpose of commercial air transport carrying passengers, unless** there is adequate lighting to— (1) Determine the landing direction, and	

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 10 (Cont.')	Operations of Aircraft	(2) Make a safe approach and landing. (c) Except where specifically authorised by the Authority, no person shall cause an aircraft with a certificated passenger capacity of more than 20 passengers to take-off or land at an aerodrome or heliport within The Bahamas for the purpose of commercial air transport carrying passengers, unless there is— (1) **Current runway analysis for obstacle clearance and stopping distance**; (2) **Established communications with a qualified person on the surface to determine** the— (i) Prevailing approach and landing conditions; and (ii) Status of runway surface. **10.487 NOISE ABATEMENT** (a) No person may take-off an aircraft at an **aerodrome where a noise abatement departure is applicable** to the aircraft without following those procedures, unless this action would not be considered safe or practical considering the existing conditions or performance limitations. (b) Unless otherwise required by special circumstances at an aerodrome, each person shall use, any one aircraft type, the same noise abatement procedure and profiles at all aerodromes. (c) No person may take-off or land an aircraft at a mass that exceeds the maximum demonstrated for that aircraft to comply with the noise certification standards, unless authorised by the competent authority of the State for a specific aerodrome or runway where there is no noise disturbance problem.	
Schedule 11	Aerial Work Operations	**11.001 APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for those operators and operations that engage in aerial work. (b) This Schedule is applicable to persons and organisations that conduct aerial work operations within The Bahamas and the persons performing duties on their behalf **11.330 SPECIAL OPERATING RULES: GLIDER TOWING** (c) The certificate holder shall **obtain the aerodrome manager's approval** to conduct banner tow operations. (d) If banner towing operations take place at an aerodrome with a control tower, the certificate holder shall inform that control tower of the time of the banner tow operation. (e) The certificate holder shall notify **the appropriate aerodrome officials** in advance when banner tow operations will be in close proximity to an uncontrolled	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
		aerodrome.	
Schedule 12	Air Operator Certification and Administration	**12.001 APPLICABILITY** (a) This Schedule applies to the carriage of passengers, cargo or mail for remuneration or hire by persons whose principal place of business or permanent residence is located in The Bahamas. (b) This Schedule of the regulations prescribes requirements for the original certification and continued validity of air operator certificates (AOC) issued by The Bahamas. (c) Except where specifically noted, this Schedule applies to all commercial air transport operations by AOC holders for which The Bahamas is the State of the Operator under the definitions provided in Annex 6 to the Chicago Convention. (e) An AOC holder shall, as part of its safety management system— (1) Establish a flight safety documents system, for the use and guidance of operational and maintenance personnel, as part of its safety management system. (2) **Assess the level of rescue and firefighting service (RFFS) protection available at any aerodrome** intended to be specified in the operational flight plan in order **to ensure that an acceptable level of protection is available** for the aeroplane intended to be used.	N/A Non-compliant RFSS on many aerodromes
Schedule 13	AOC Passenger Carrying Requirements	**13.001 APPLICABILITY** (a) This Schedule prescribes the passenger-carrying requirements, in addition to the requirements of Schedule 10, for— (1) AOC holders, (2) Corporate aviation operations (3) Other operators of aeroplanes— (i) That are turbojet-powered; or (ii) With a maximum take-off gross weight of more than 5700 kg; and/or (iii) Have a maximum passenger configuration of more than 9 passengers.	N/A
Schedule 14	AOC Personnel Qualification	**14.001 APPLICABILITY** (a) This Schedule prescribes the minimum requirements for qualification and currency of operations personnel to be able to serve in commercial air transport or to be used by the holder of an Air Operator Certificate issued by The Bahamas. (b) This Schedule is applicable to the persons and entities engaged in commercial air transport operations and the persons performing duties on their behalf.	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 15	AOC Duty Periods, Rest Periods and Flight Time	**15.001 APPLICABILITY** (a) This Schedule prescribes the maximum duty periods, maximum flight time and minimum rest periods to ensure that key crew and operations personnel do not experience fatigue during AOC-related duties. (b) This Schedule is applicable to the persons and entities engaged in commercial air transport operations where the Bahamas has granted the Air Operator Certificate	N/A
Schedule 16	Air Operator Flight Release Requirements	**16.001 APPLICABILITY** (a) This Schedule prescribes the requirements of the Commonwealth of the Bahamas for the operational control of AOC holders, both within the Bahamas and during international operations outside the Bahamas (b) This Schedule is applicable to the AOC holder, the person designated by the AOC holder to issue a flight release, and any other person that performs a function regarding the flight can be construed to fall under the definition of operational control. **16.070 FLIGHT RELEASE: FACILITIES & NOTAMS** (a) No person may release an aircraft over any route or route segment unless there are adequate communications and navigational facilities in satisfactory operating condition as necessary to conduct the flight safely. (b) The Operational Control Person shall ensure that the PIC is provided all available current reports or information on **aerodrome conditions and irregularities of navigation facilities that may affect the safety of the flight**. (c) For their review of the operational flight plan, the PIC shall be provided with all available NOTAMs with respect to the routing, facilities and **aerodromes**.	N/A NOTAMS were not prepared where necessary
Schedule 17	Mass & Balance &Performance	**17.001 APPLICABILITY** (a) This Schedule prescribes mass and balance and aircraft performance and operating limitations in addition to those in Schedule 10, (b) These requirements of this Schedule apply to aircraft used in— (1) Commercial air transport operations; and (2) General aviation operations, by— (i) Turbojet airplanes; and (ii) Large airplanes. **17.100 MASS LIMITATIONS** (a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which the aircraft will be capable of complying with the performance safety margins of Subpart E and F of this Schedule for— (d) In no case shall the estimated mass for the expected	N/A Mass loading limitations or noise certification not determined/ observed for aerodromes

Schedule	Purpose	Applicability	Observed/ Not Observed
		time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the **maximum landing mass specified in the flight manual for the—** **(1) The pressure altitude appropriate to the elevation of those aerodromes**; and (2) Any other local atmospheric condition that is used as a parameter to determine the maximum take-off mass. (e) In no case shall the mass at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum masses at which **compliance has been demonstrated with the applicable noise certification Standards in Annex 16,** Volume I, unless otherwise authorised by competent authority of the State— (1) In exceptional circumstances for a certain aerodrome; or (2) On a runway where there is no noise disturbance problem.	
Schedule 18	Carriage of Dangerous Goods	**18.001 APPLICABILITY** (a) The requirements of this Schedule shall apply to the carriage of dangerous goods by air as specified in— (1) The International Civil Aviation Organisation Document, Technical Instructions for the Safe Transport of Dangerous Goods by Air. and all applicable amendments; and (2) As amplified by, the Dangerous Goods Regulations of the International Air Transport Association. (b) This Schedule is applicable to operators of aircraft in— (1) Aerial work; (2) Commercial air transport; and (3) General aviation. (c) This Schedule is applicable to pilots and other persons performing duties required by these regulations. (d) Any instructions or limitations contained in the Technical Instructions for the carriage of dangerous goods on passenger or cargo aircraft, as therein defined shall for the purpose of this Schedule be interpreted as applying also to the carriage of such goods beneath passenger or cargo aircraft. **18.260 INFORMATION FROM PILOT-IN-COMMAND TO AERODROME AUTHORITIES** (a) If an in-flight emergency occurs, the pilot-in-command shall, as soon as the situation permits, **inform the appropriate air traffic services unit, for the information of aerodrome authorities**, of any dangerous goods on board the aircraft, as provided for in the Technical Instructions.	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 19	Accident & Incident Reporting & Investigation	**19.001 APPLICABILITY** (a) This Schedule contains requirements pertaining to— (1) Notification, investigation, analysis and reporting of aircraft incidents and accidents and certain other occurrences in the operation of aircraft— (i) When they involve Bahamas-registered aircraft, wherever they occur; and (ii) When they involve foreign-registered civil aircraft, where the events occur in The Bahamas; (2) Preservation of aircraft wreckage, mail, cargo, and records involving all civil and state aircraft accidents in The Bahamas; (3) Conformance to the international Standards for accident and incident reporting. (b) This Schedule is applicable to the— (1) Organisations and operators that operate aircraft or provide services associated with the safe operation of aircraft; and (2) **All Government agencies necessary to ensure the timely and correct investigation and reporting of accidents**. (c) This Schedule is also applicable to— (1) All persons associated with the safe operations of aircraft; (2) The general public where they have information pertinent to an accident or incident investigation; and (3) The technical persons that participate in the investigations. **19.060 APPLICABILITY TO PERSONS & ORGANISATIONS INVOLVED** (a) The mandatory reporting requirements of this Subpart are applicable to persons and organisations involved in the— (1) Operations, maintenance and support of Bahamas-registered aircraft worldwide; (2) Operations, maintenance and support of aircraft operating in the Bahamas; and (3**) The provision of services to aircraft and crews in the operational airspace controlled by the Bahamas and the aerodromes located in the Bahamas.** (b) Persons and organisations included in this applicability are— (9) A licensee and a manager of a licensed aerodrome or **a manager of an airport**; **APPENDIX 3 TO 19.070: MANDATORY REPORTS: AIR NAVIGATION OCCURRENCES**	Reporting of Incidents and Accidents will be incorporate in the SMS (and will reference this Schedule)

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 19 (Cont.')	Accident & Incident Reporting & Investigation	(a) Near collision incidents (encompassing specific situations where one aircraft and another aircraft/the **ground**/a vehicle/person or object are perceived to be too close to each other)— (1) Separation minima infringement; (2) Inadequate separation; (3) "Near-CFIT" (near-controlled flight into terrain); (4) **Runway incursion** where avoiding action was necessary. (b) Potential for collision or near collision (encompassing specific situations having the potential to be an accident or a near collision, if another aircraft is in the vicinity)— (1) **Runway incursion** where no avoiding action is necessary; (2) **Runway excursion**; (3) Aircraft deviation from ATC clearance; (4) Aircraft deviation from applicable "ATM" (air traffic management) regulation— (i) Aircraft deviation from applicable published ATM procedures; (ii) Unauthorised penetration of airspace; (iii) Deviation from aircraft ATM-related equipment carriage and operations, as mandated by applicable regulation(s). (c) ATM-specific occurrences (encompassing those situations where the ability to provide safe ATM services is affected, including situations where, by chance, the safe operation of aircraft has not been jeopardised. This shall include the following occurrences— (1) Inability to provide ATM services: (i) inability to provide air traffic services; (ii) inability to provide airspace management services; (iii) inability to provide air traffic flow management services; (2) Failure of Communication function; (3) Failure of Surveillance function; (4) Failure of Data Processing and Distribution function; (5) Failure of Navigation function (6) ATM system security. (7) Examples of include— (i) **Provision of significantly incorrect, inadequate or misleading information from any ground sources**, e.g. ATC, "ATIS" (automatic terminal information service), meteorological services, navigation databases, maps, charts, manuals, etc. (ii) Provision of less than prescribed terrain clearance. (iii) Provision of incorrect pressure reference data (i.e. altimeter setting).	

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 19 (Cont.')	Accident & Incident Reporting & Investigation	(iv) Incorrect transmission, receipt or interpretation of significant messages when this results in a hazardous situation. (v) Separation minima infringement. (vi) Unauthorised penetration of airspace. (vii) Unlawful radio communication transmission. (viii) Failure of ANS ground or satellite facilities. (ix**) Major ATC/ATM failure or significant deterioration of aerodrome infrastructure**. (x) **Aerodrome movement areas obstructed by aircraft, vehicles, animals or foreign objects, resulting in a hazardous or potentially hazardous situation**. **(xi) Errors or inadequacies in marking of obstructions or hazards on aerodrome movement areas resulting in a hazardous situation.** **(xii) Failure, significant malfunction or unavailability of aerodrome lighting** (d) "ATC" (air traffic control) Navigation and Communications - significant malfunction or deterioration of service. (e) An aircraft was or could have been endangered by impairment of any member of ground staff (e.g. ATC, "FD" (flight dispatchers), Maintenance, etc.). (f) ATC overload. (g) Failure or unplanned shutdown of a major operational ATC computer system, requiring reversion to manual back-up and resulting in disruption to the normal flow of air traffic.	

Table 8: Summary of Schedules Not Currently Referenced in the BASR, 2001[1]

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 20	Foreign Operators	**20.001 APPLICABILITY** (a) This Schedule prescribes requirements applicable to the operations in Commonwealth of The Bahamas— (1) Of any foreign-registered civil aircraft by a foreign citizen who does not hold resident status in the Bahamas; or (2) Involving commercial air transport by a foreign air operator.	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 21 (cont.')	Aerodrome Standards & Certification	**21.001 APPLICABILITY** (a) This Schedule prescribes the requirements of the Commonwealth of The Bahamas for certification of aerodromes and the operations and operators of these aerodromes. (b) This Schedule is applicable to persons and organisations that operate aerodromes within the Bahamas and the persons performing duties on their behalf. (c) **The requirement for airport certification shall apply to**— (1) Airports that serve scheduled and unscheduled air carrier aircraft with more than 30 seats; (2) Airports that serve scheduled air carrier operations in aircraft with more than 9 seats but less than 31 seats; and (3) Any other aerodrome, where the Minister is of the opinion that it is in the public interest for that aerodrome to meet the requirements necessary for the issuance of an airport certificate. (d) **The requirement for airport certification shall not apply to aerodromes at which air carrier passenger operations are conducted only because the airport has been designated as an alternate airport.** (e) Aerodromes exempt from the requirement for certification are aerodromes for which— (1) The Minister has written an exemption; and (2) **An equivalent level of safety is defined**. (f) The certification and operating requirements described in this Schedule shall— (1) Reflect the Standards and Recommended Practices of ICAO Annex 14; (2) Volume 1, Aerodromes, ICAO Document 9774, Manual on Certification of Aerodromes; and (3) Form the basis for a judgment on the potential suitability of the aerodrome to be licensed and operated, taking into account the scale and scope of the flying activity which is to take place there **21.015 COMMON REFERENCE SYSTEMS** Aerodrome Design (h) The design of aerodromes should take into account, where appropriate, land-use and environmental control measures **21.025 PROHIBITIONS IN CERTIFIED AERODROMES** (a) No aircraft operator shall, except with the approval of the aerodrome operator, park or abandon used or unused aircraft on the movement areas of the aerodrome. (b) No person shall, **except with the approval of the certified aerodrome operator**—	No certificates observed BCAD should confirm which aerodrome will be certified and which will be "Exempted" aerodromes per **21.015** Terminology and definitions in this Schedule need to reflect the language used in the 4 task reports Waste was observed at aerodromes (vehicles, etc.) Soil pollution was observed Trespass on the air side was prevalent No "approval "was observed

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 21 (cont.')	Aerodrome Certification & Operation	(1) **Drive a vehicle** into restricted areas of the aerodrome or the terminal building; or (2) Obstruct an entrance to or passage in the terminal building in such a manner as to inconvenience other aerodrome users. (c) No person shall, on a certified aerodrome— (1) Obstruct or interfere with the authorised use of the aerodrome; (2) Obstruct any employee of the aerodrome operator acting in the execution of his or her duty in relation to the aerodrome; (3) Throw, leave, or drop anything capable of causing injury to any person or damage to property; (4) Dump any waste matter whatsoever elsewhere other than a place designated and approved for the purpose by the aerodrome operator; (5) Commit any nuisance, disorderly or indecent act, write, draw or affix any profane, obscene or abusive materials on an aerodrome; (6) **Spill or release substances capable of causing air, water, or soil pollution**. (d) No person shall, except with permission of the aerodrome operator, interfere or tamper with any area of the aerodrome or any equipment associated with the operation of the aerodrome to— (1) Trespass or gain access through restricted structures; (2) Carry out trade of any level and magnitude including foreign exchange; (3) Advertise in the aerodrome; (4) Handle passengers and baggage or confront passengers and aerodrome users for unsolicited service; (5) **Supply any fuel to any aircraft except at a place and in a manner approved by the aerodrome operator**. (e) The aerodrome operator shall subject to any approval granted under paragraph (d) to compliance with such conditions as the aerodrome operator may impose in order to safeguard the safety of persons and property on the aerodrome. **21.030 OBSTACLE LIMITATION** (d) An aerodrome operator shall ensure that obstacle limitation surfaces are established for the aerodrome in accordance with the standards set out in ICAO Annex 14 Volume 1. (e) An aerodrome operator shall— (1) Take all reasonable measures to ensure that obstacles at, or within the vicinity of, the aerodrome are detected as	Multiple obstacles were observed NOTAMs were not issued No aerodrome manuals observed No SMS No AEP

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 21 (cont.')	Aerodrome Standards & Certification	quickly as possible; (2) If the operator becomes aware of the presence of an obstacle— (i) Report it to the NOTAM office immediately; and (ii) Provide the NOTAM office details of the height and location of the obstacle and amended declared distances and gradients, if applicable. **21.440 REMOVAL OF CONTAMINANTS** (f) Chemicals which may have harmful effects on aircraft or pavements, or chemicals which may have toxic effects on the aerodrome environment, shall not be used. **21.455 PROHIBITIONS IN CERTIFIED AERODROMES** (4) Dump any waste matter whatsoever elsewhere other than a place designated and approved for the purpose by the aerodrome operator; (6) Spill or release substances capable of causing air, water, or soil pollution **21.467 APPLICATION FOR AERODROME CERTIFICATE** (a) An application for the issuance of an aerodrome certificate or an amendment thereto, shall be made in the form and manner prescribed by the Authority. and accompanied by— (3) an environment impact assessment report **21.583 WILDLIFE HAZARD REDUCTION** (a) Each applicant for an aerodrome operating certificate shall, where any wildlife presents a hazard to aircraft operations at the aerodrome, establish in areas within their authority an environmental management programme to minimize or eliminate such wildlife hazard which— **SUBPART C: AERODROME MANUAL** **SUBPART D: OBLIGATIONS OF THE AERODROME OPERATOR** **SUBPART E: AERODROME DESIGN REQUIREMENTS** **SUBPART F: OPERATING REQUIREMENTS**	
Schedule 22	Flight Procedures Service Certification & Operations	**22.001 PURPOSE & APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for the— (1) Certification and operation of an organisation that provides services for the design and maintenance of instrument flight procedures; and (2) Technical standards for the design of instrument flight procedures. (b) This Schedule is applicable to— (1) Persons seeking certification to provide instrument flight procedures services;(2) Organisations that provide the	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
		required instrument flight procedures services; and (3) Persons that administer the required instrument flight procedures services on behalf of the organisations. (c) This Schedule does not apply to the design of aircraft performance operating limitations or flight paths, for critical engine inoperative emergency procedures **SUBPART E: DESIGN CRITERIA—INSTRUMENT FLIGHT PROCEDURE** **22.120 DESIGN** (d) An instrument flight procedure shall not be designed for an aerodrome or heliport unless the operator of the aerodrome or heliport agrees in writing that the aerodrome or heliport may be used for IFR operations using the intended instrument flight procedure.	
Schedule 23	Aeronautical Information Service Certification & Operations	**23.001 PURPOSE & APPLICABILITY** (a) This Schedule prescribes requirements of the Bahamas for– (1) Governing the certification and operation of organisations providing aeronautical information service for Bahamas aviation; and (2) For the Aeronautical Information Publications (AIP), Aeronautical Information Circulars (AIC) and Notice to Airmen (NOTAM). (b) This Schedule is applicable to— (1) Persons seeking certification to provide aeronautical information services; (2) Organisations that provide the required aeronautical information services; and (3) Persons that administer the required aeronautical information services on behalf of the organisations **SUBPART E: AERONAUTICAL INFORMATION PUBLICATION** **23.130 CONTENTS OF AIP** (a) The AIP shall contain current information, data and aeronautical charts relating to– (1) The regulatory and airspace requirements for air navigation in the Nassau FIR and the areas of the Nassau FIR in which Bahamas is responsible for air traffic services; (2) The Bahamas services and facilities that support international air navigation to and from Bahamas; (3) The services and facilities that support air navigation within the Nassau flight information region; and (4) **Aerodromes** operating under an aerodrome operating certificate issued in accordance with Schedule 21 of these requirements.	

Schedule	Purpose	Applicability	Observed/ Not Observed
Schedule 24	Air Traffic Service Certification & Operations	**24.001 PURPOSE & APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for— (1) The certification of organisations providing an air traffic service in the Nassau Flight Information Region (FIR); and (2) The operating and technical standards for providing air traffic service by those organisations. (b) This Schedule is applicable to— (1) Persons seeking certification to provide air traffic services; (2) Organisations that provide the required air traffic services; and (3) Persons that administer the required air traffic services on behalf of the organisations. (c) Subparts A, B, C and D apply to services specified in paragraphs (1) to (6) of the definition of air traffic services. (d) Subpart E and this Section apply to services referred to as air traffic services in paragraph (7) of the definition of air traffic services. (e) In this Schedule, references to the Nassau FIR exclude those portions of airspace within the flight information region that are designated as sectors where an ICAO Contracting State other than Bahamas is providing the air traffic service. **24.090 COORDINATION REQUIREMENTS** (a) An applicant for an air traffic service certificate shall establish systems and procedures to ensure, where applicable, coordination between each ATS unit listed in the holder's Organisation and Procedures Manual and the following agencies— (9) Where the listed ATS unit is an aerodrome control or aerodrome flight information unit— (i) The aerodrome operator; and (ii) The apron management service, if that service is not provided by the aerodrome control unit.	N/A
Schedule 25	Aeronautical Telecommunications Services Certification & Operations	**25.001 PURPOSE & APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for— (1) Operating and technical standards for aeronautical telecommunication services and facilities; (2) Governing the certification and operation of organisations providing aeronautical telecommunication services in support of Instrument Flight Rules (IFR) flight or an air traffic service. (b) This Schedule is applicable to—	N/A

Schedule	Purpose	Applicability	Observed/ Not Observed
		(1) Persons seeking certification to provide aeronautical telecommunications services; (2) Organisations that provide the required aeronautical telecommunications services; and (3) Persons that administer the required aeronautical telecommunications services on behalf of the organisations.	
Schedule 26	Aviation Meteorological Services Certification & Operations	**26.001 PURPOSE & APPLICABILITY** (a) This Schedule prescribes the requirements of The Bahamas for— (1) The certification and operation of organisations providing meteorological services for international aviation; and (2) Governing the provision of basic weather reports for aviation. (b) This Schedule is applicable to— (1) Persons seeking certification to provide meteorological services for aviation; (2) Organisations that provide the required meteorological services for aviation; and (3) Persons that administer the required meteorological services for aviation on behalf of the certificated organisations.	N/A

1. Source: BCAD Web Site (http://www.bcaa.gov.bs/regulations/)

8.3 CHALLENGES FACING THE CIVIL SERVICE OF THE BAHAMAS

Two major structural problems characterize the civil service of The Bahamas today:

a. An aging workforce, and
b. Poor working conditions, mainly due to budgetary constraints.

The combined effects of these issues include low morale and motivation that ultimately result in poor performance, lack of accountability and lessened public service performance. The underlying factor of the aging of the civil service workforce is that Government culture and compensation can make the private sector more appealing for young persons, contributing to the retention of young talent at a time when the Government seeks to improve the quality of service performance. Another factor includes the mandatory retirement age of 60 years for both male and female civil servants. The retirement age in the private sector is 65 years of age.

The following statement on the Public Sector Reform of The Bahamas put into focus some of the institutional challenges facing BCAD:

"In order to benefit from any progressive initiatives, the people of The Bahamas must be strong proponents of public sector reform. The Civil Service must be overhauled and transformed into an efficient and effective deliverer of public services. There must also be a new culture of professionalism leading to the execution of timely decisions, and informed discussion by the general public in matters of national interests. There must be land reform leading to the imposition of a modern land registration system thereby bringing certainty to land ownership in The Bahamas. This will create wealth amongst land owners in the Family Islands and will allow for Bahamians to secure lending options for development." [1]

Complicating departmental responsibility, the Bahamas National Trust (Amendment) Act 2010 provides the Bahamas National Trust with the ability to "be at liberty from time to time to advise both the Government of The Bahamas and the private sector generally on development issues and policies relating to conservation, the environment, biodiversity, natural and cultural heritage and resource management."

Previous legislative efforts have failed, including draft legislation specific to Environmental Impact Assessments. Recommendations are continuously made for a Department of Environment and Physical Planning to provide oversight and streamlined accountability for environmental issues.

8.4 INSTITUTIONAL ANALYSYS SUMMARY

Based on this report's recommendations for the establishment of a formal structure to manage Health & Safety and Environment (HSE), Aviation Safety (SMS), and aerodrome emergency plans (AEPs) at Family Islands Airports, it is Stantec's opinion that BCAD does not have in place trained personnel that would meet the needs of the proposed standards and guidelines included in the Appendices of this report.

Where staff members are currently in positions at the various aerodromes and at BCAD in Nassau, there is a need for training to be developed/coordinated specific to the issues discussed herein. As indicated throughout the report, there is also a need for the establishment of additional positions in order to ensure the appropriate level of leadership, technical support and local oversight. In most cases, the existing regulations and referenced standards provide a sufficient framework for demonstrating due diligence in the protection of human, ecological and aviation safety. Where the current situation falls short is in the establishment of formal management systems aimed at the identification of hazards, their mitigation, their reporting and follow-up for continuous improvement, the formal designation of key staff and their training to implement these systems, and the general training for all staff.

[1] A Blueprint for the Future, Raynard Rigby, 2014

8.4.1 SMS Integration Recommendations

Stantec's review of the current implementation of Schedule 21 requirements confirmed that at the time of the assessment, none of the Family Islands Airports had an Airport Operations Manual nor did they have a Safety Management System (Manual) in place. A Gap Analysis based on the guidance provided by ICAO in Appendix 7 to Chapter 5 of ICAO Doc 9859 AN/474 Safety Management Manual (SMM) is provided in **Appendix C** of this report. None of the required elements of an SMS were fully observed at the time of the site visits nor did the current staff have the training or capacity to implement an SMS at their aerodrome.

It is recommended that the SMS implementation will need to be fully integrated with the existing Security Plans and the implementation of the proposed Aerodrome Emergency Plans (AEPs) as well as the Wildlife Management Plans (refer to the recommendations further in this section).

Tier 1 and Tier 2 aerodromes will require the implementation of a SMS in accordance with the recommendations in **Section 5.2** of this report. Implementation of the SMS for Tier 3 aerodromes will be significantly different from the process outlined for the Tier 1 and Tier 2 aerodromes. In the absence of a full time organisation at the airfield with limited air traffic and no scheduled flights, the safety oversight function at Tier 3 aerodromes could be coordinated by the Safety Office at BCAD with the collaboration of on-site personnel residing on the Island where the aerodrome is located and in coordination with the Island Administrator. As resolved in ICAO Resolution A38-5 (Appendix J), runway safety will always be given a high priority in the establishment of any SMS.

8.4.2 Environmental Integration Recommendations

General recommendations to improve the integration of environmental parameters with airport new construction, ongoing operation, refurbishment, and demolition include the following:

1. **Environmental Policy.** Create an overall environmental policy for the Airport Authority/Civil Aviation Department.
2. **Baseline Environmental Conditions.** This would include a biological assessment of vegetation communities and avifauna identified within the airport boundaries. Habitat types will influence avifauna species and storm water drainage. Baseline reporting can include consultation with Antiquities, Monuments, and Museum Corporation if items of cultural significance are found. This assessment will be critical in setting the baseline for the creation of wildlife hazards management (wildlife management plans) to be integrated in the aerodrome SMS.
3. **Environmental Personnel.** Insert a position or identify an existing position to hold responsibility for matters pertaining to the environment within the Aviation sector. Alternatively, the creation of a position within the BEST Commission or Ministry of the Environment with responsibility and training for environmental matters specific to airports could be considered.

4. **Sedimentation, Erosion, and Storm Water Control Plan.** Airports in very close proximity to water bodies and shoreline should have stormwater control plans to prevent pollution from contaminated runoff.
5. **Study on Coastal Management.** Many of the airports are in close proximity to water bodies, i.e. wetlands or coast. Climate adaptation related to airport operations in light of climate change and sea level rise is another significant issue to be addressed, especially in consideration of capital investments for any major aerodrome improvement projects. BCAD may want to consider a study on coastal zone management as it relates to aerodromes and safety where drainage could become a significant challenge.

8.4.3 Staffing Recommendations

Key staffing requirements in support of the implementation of SMS for Family Islands Airports as per the templates found in **Appendix A** and **Appendix B** include the designation of an Accountable Executive at BCAD representing all Family Islands Airports as well as the designation of an SMS Manager for each Tier 1 and Tier 2 Airport. The SMS Manager could be the designated Airport Manager for these aerodromes. The SMS Manager will be critical in the implementation of the SMS Plan. Tier 3 aerodromes SMSs would be coordinated by the Accountable Executive at BCAD with support from the Island Administrators and their proposed aerodrome designate.

It is recommended that the Family Islands Airports adopt a streamlined HSE Standard proposed in **Appendix D** to effectively manage their environment, health & safety requirements. Key staffing requirements in support of the implementation of OHS Programmes for Family Islands Airports include the designation of an Accountable Environment, Health & Safety (HSE) Manager representing all Family Islands Airports. It is proposed that an HSE Manager position be created for Tier 1 aerodromes, and that individual Airport Managers could implement OHS initiatives at Tier 2 aerodromes. OHS issues at Tier 3 aerodromes would be managed through the centralized Family Islands Airports HSE Manager at BCAD.

Training will be required for all proposed management positions responsible for the implementation of the various plans as well as for all Civil Aviation personnel in terms of awareness to the plans, hazard recognition, and reporting responsibilities.

8.4.4 Budget Opinion of Costs – Task 2.

A programme budget of $1 million dollars USD) over three years is proposed to implement the recommendations of the Task 2 Report. Activities include staffing positions, outreach and communication, training, planning, environmental base lining, and implementation support. Reduction of incidents, accidents, losses, and future financial contingent liabilities, as well as improved morale and performance will be the net results of the implementation of the recommendations provided in this Task Report.

9 DEVELOPMENT OF GUIDELINES AND STANDARDS

The development of the proposed guidelines and standards/generic manuals included in **Appendix A** (Tier 1 and Tier 3 Generic SMS Manual), **Appendix B** (Tier 3 Generic SMS Manual), **Appendix D** (Proposed HSE Standard), and **Appendix E** (Environmental Guidelines) of this report was done in accordance with ICAO SARPs and international best practices such as the IFC and ISO frameworks. These guidelines and standards are applicable at any phase of an airport's life-cycle; from the planning of a new airport to implementation at a fully operational aerodrome. The approach generally included consideration of:

- Aspects and Hazards;
- Legal and Other Requirements (including Advisory Circulars under the BASR);
- Setting of Objectives and Targets;
- Roles and Responsibilities;
- Competence, Training and Awareness;
- Operational Controls;
- Monitoring of Compliance; and
- Management Review and Follow-up

9.1 IDENTIFICATION OF ASPECTS AND HAZARDS

Inherent in airport activities and operations are various elements which can interact with and have impact on aviation safety, the environment, and Occupational Health & Safety (OHS) – referred to as aspects. In conjunction with this, it is important to recognize that aspects can result in impacts to operations, the environment and employees, where an impact is defined as any change, positive or negative, resulting from these interactions. In addition, also inherent in operations are various sources, situations or acts with a potential for aircraft accidents or harm in terms of human injury or ill health – referred to as hazards.

Based on an informal assessment of typical airport operations, including input from personnel within the Civil Aviation team, typical risks/hazards associated with the planning, design, operation and maintenance of airports have been identified as follows:

- SMS Hazards include:
    - Runway incursions (other aircraft, vehicles, wildlife and/or personnel);
    - Bird strikes;
    - Foreign Object Damage (FOD);
    - Runway/Taxi way/Apron conditions;
    - Runway lighting system malfunction;
    - Extreme weather;
    - Obstacles and obstructions affecting manoeuvring areas; and
    - Hazardous material spills.
- Environmental Aspects include:

  - Consumption of energy (resource depletion);
  - Consumption of water (resource depletion);
  - Spills / releases during operational activities or from products in storage, resulting in contamination to soil, water or air (i.e., fuels, maintenance chemicals, paints, halocarbons);
  - Runoff of contaminated surface water (i.e. from operational activities, outdoor storage areas, outdoor chemical use, etc.) resulting in contamination of soils and groundwater;
  - Contamination of soil, water or air, and/or health hazard to employees, from improper waste storage, handling and/or disposal (e.g., domestic wastes, hazardous wastes/waste dangerous goods, construction/demolition wastes, contaminated soils, etc.);
  - Emission of air contaminants/noise from operational activities;
  - Contamination of soil, water or air, and/or health hazard to employees, from improper wastewater management (including sewage and industrial wastewater, where relevant); and
  - Degradation of the natural environment (for example, related to construction/development activities).

- OHS Hazards include:
  - Physical injury to employees related to general workplace condition and operational activities (building or aircraft related);
  - Employee exposure to chemical agents stored on site or from cargo handling at the aircraft;
  - Employee exposure to jet/turbo prop blast;
  - Employee exposure to noise from aircraft;
  - Falls and slips;
  - Lifting and pulling; and
  - Exposure to exhaust fumes from aircraft engines.

For the purposes of this document, it should be noted that the management and control of certain risks/hazards will be achieved through the implementation of the proposed Family Islands Airports:

- Safety Management System (SMS);
- Aerodrome Emergency Plans (AEPs) under separate cover;
- HSE Standard;
- Proposed Environmental Guidelines;
- Hazardous Cargo Management (separate cover); and
- Energy and Water Conservation (separate cover).

9.1.1 Risk Categorization

In order to allow for effective allocation of resources to the control and management of risks, and to establish the basis for a risk management process which is pro-active rather than

reactive, it is important to understand the relative ranking of risks in relation to each other. A generic process can be applied to the ranking of risks inherent in airport operations, and is described below.

Risk can be determined based on the estimated likelihood of an event occurring and the potential consequences that would result from such an occurrence, using the formula:

Risk = Likelihood X Consequence

Likelihood of an event occurring can be ranked as follows:

Likelihood Ranking	How frequently does the hazard event occur, that may result in an impact?
1 (Low)	Rare – can happen, but almost impossible
2 (Medium)	Possible – occurs occasionally within a period of 2 to 5 years
3 (High)	Event is likely to happen during the year

Factors that may affect the likelihood of an event occurring relate to: culture and/or capacity to undertake various activities; frequency of occurrence of various activities/operations; and absence of procedures or proper equipment.

Consequence can be considered as a function of severity of an aircraft accident (injury and/or death), environmental damage, and impact to personal health and safety, as follows:

Consequence Ranking	Severity of Damage	Impact to Health and Safety
1 (Low)	Undetectable/insignificant/minimal damage restricted to immediate vicinity of activity	Minor first aid cases
2 (Medium)	Mitigable or reversible damage	Injury with loss of time. Permanent disability or loss of function (<30%) of body part
3 (High)	Irreversible severe damage	Death or injury resulting in amputation or permanent loss of a function (> 30%)

Following determination of **Likelihood** and potential **Consequence** rankings, **Risk** can be calculated, and relative level of risk can be determined. The Determination of Risk Levels Matrix below indicates the relative risk level of each aspect / hazard. The risk level is a calculated index consisting of the Likelihood ranking multiplied by the Consequence ranking. The results of this calculation for each possible combination of Likelihood and Consequence, and the implications of the results are shown in the tables below.

Determination of Risk Levels Matrix

	Consequence		
Likelihood	1 (Low)	2 (Medium)	3 (High)
1 (Low)	L-1	L-3	H-6
2 (Medium)	L-2	T-5	H-8
3 (High)	T-4	H-7	H-9

With risk and action levels being defined as:

L	Low	Manage with the practices in place
T	Tolerable	Manage and keep under review. Develop an action plan to reduce the level of risk
H	High	Action must be taken urgently in order to reduce the risk to an acceptable level

8.1.2 Environmental Risks

Application of the above evaluation and risk ranking process to the typical risks / hazards associated with the planning, design, operation and maintenance of the Family Islands airports listed above results in the following rankings:

Table 9: Overall Prioritization Ranking of Environmental Risks

Aspect / Hazard	Likelihood Ranking	Consequence Ranking	Risk Ranking
Consumption of energy	3	2	6
Consumption of water	3	2	6
Runoff of contaminated storm water (i.e. from operational activities, outdoor storage areas, outdoor chemical use, etc.) resulting in contamination of groundwater	2	3	6
Degradation of the natural environment (for example, related to construction/ development activities)	2	3	6
Spills / releases during operational activities or from products in storage, resulting in contamination to soil, water or air (i.e., fuels, maintenance chemicals, paints, halocarbons)	2	2	4

Aspect / Hazard	Likelihood Ranking	Consequence Ranking	Risk Ranking
Emission of air contaminants / noise from operational activities	3	1	3
Physical injury to employees related to general workplace condition and operational activities	2	2	4
Contamination of soil, water or air, and/or health hazard to employees, from improper waste storage, handling and/or disposal	2	1	2
Contamination of soil, water or air, and/or health hazard to employees, from improper wastewater management	2	1	2

It is important to note that the ranking of aspects and hazards will need to be re-evaluated periodically, to account for changing conditions which may affect likelihood of an event occurring, and/or severity of resulting consequences from such an occurrence.

The results of this section have driven the determination of the specific Environmental Guidelines that have been prepared for application to airports in The Bahamas.

9.2 CONSIDERATION OF LEGAL AND OTHER REQUIREMENTS

In the development of the generic SMS Manuals as well as the HSE Standard and associated Environmental Guidelines, the requirements included the environmental legislation of The Bahamas; past reports or studies that have been conducted; and results of stakeholder consultations have been considered, as well as requirements outlined in IFC Guidelines and ICAO SARPs were considered and incorporated where relevant.

9.3 SETTING OF OBJECTIVES AND TARGETS

9.3.1 HSE Objectives and Targets

Both the ISO 14001 standard for Environmental Management Systems and the OHSAS 18001 standard for Occupational Health & Safety Management Systems include elements related to the establishment, implementation and maintenance of documented objectives and targets around environment, health and safety. In order to act as effective tools for management, objectives and targets should be measureable, where practicable, and should be consistent with policy statements made by the organisation. When establishing objectives and targets, and reviewing progress made towards their achievement, the organisation shall consider relevant legal and other requirements as well as those aspects and/or hazards identified as being significant through the ranking process. In addition, technological options, financial, operational and business requirements, and the views of interested parties should also be considered.

When implementing Environmental Guidelines at any Airport, objectives and targets should be set that are specific to the facility being considered, and the aspect or hazard being considered. The setting of defined objectives and targets will aid in focusing the application of Environmental Guidelines to airport facilities, to achieve desired results in controlling aspects/hazards.

The Civil Aviation Department should consider setting and reviewing objectives and targets annually, so as to ensure that application of Guideline requirements are focused and purposeful, and to contribute to continual improvement in the area of HSE.

Specific programmes related to the achievement of objectives and targets can then be established, to include designation of responsibility for achieving objectives and targets at relevant functions and level of the organisation, and the means and time-frame by which they are to be achieved.

9.3.2 SMS Objectives and Targets

The Generic SMS Manuals prepared and attached in the Appendices of this report provides details for the establishment of Aviation Safety Objectives and Targets through the Safety Policy. Targets are meant to be measurable in order to compare to objectives and monitor for continuous improvement. Refer to the Generic SMS Manuals for additional details (see Appendices A and B). At a minimum, the objectives and targets should align with those established in the BCAD State Safety Programme (SSP, 2011) as well as those outlined in the ICAO Global Aviation Safety Plan: 2013 from the 38th Assembly of ICAO.

9.4 ROLES & RESPONSIBILITIES

In order to ensure effective implementation of SMS and HSE Guidelines, clear roles and responsibilities related should be defined and communicated. Consideration should be given to roles and responsibilities associated with accountability related to performance targets, reporting on progress, and making recommendations for improvement, where required.

Recommendations are provided in the Functional Analysis submitted in this report as well as form part of a separate Civil Aviation Organisational Management Consultancy (IATA, 2014) occurring concurrently.

9.5 COMPETENCE, TRAINING AND AWARENESS

As defined by both the ICAO SMS Standard and the ISO 14001 and OHSAS 18001 standards, an organisation is required to ensure that persons performing tasks for it or on its behalf, which have the potential to cause a significant aviation safety, or environmental and/or OHS impact, are competent on the basis of appropriate education, training or experience. Records to demonstrate this competence should be retained.

Education, training or experience relevant to the control of specific aspects and hazards is critical to ensuring effective implementation of SMS and HSE Standards and Guidelines, in order to bring a competent approach to the continual improvement process. Training needs associated with specific aviation safety as well as environmental aspects and OHS hazards should be identified.

In particular, persons working for the organisation, or on its behalf in the case of contracted employees, should be made aware of the importance of conformance with policy statements associated with the organisation's mission and values, and the ways in which they can contribute through their job functions. They should also be aware of potential impacts to aviation safety and the environment and/or employee health and safety associated with their work, and conversely, the benefits of improved personal performance.

It is assumed that further assessment of competencies, training and awareness required for effective SMS and HSE management activities is addressed in the Functional Analysis occurring concurrently with the development of these Guidelines (IATA, 2014).

9.6 STRATEGIES AND INITIATIVES FOR OPERATIONAL ENVIRONMENTAL CONTROL

Building on the prioritization of environmental aspects and hazards above, strategies and initiatives for minimizing potential impacts on the environment and potential hazards to employee health and safety, can be developed and implemented. In addition to contributing to the management and control of HSE risks, the development and implementation of strategies and initiatives can also result in significant cost savings to the organisation.

Taking into account the prioritization of aspects and hazards, short term and longer term risk control strategies and initiatives should be developed.

Based on the current institutional review at the Family Islands airports, the following short term and longer term overarching risk control strategies are proposed:

<u>Short Term (within the first 2 years)</u>

- Agree to Standards/Roll out a Policy;
- Baseline Audits/Foot printing; and
- Training.

<u>Longer Term (3-5 years out)</u>

- Implement Reduction Strategies (predicated by tier of airport);
- Checking; and
- Improvement.

Specific strategies and initiatives related to the control of environmental aspects and OHS hazards, in the form of Short Term and Longer Term Goals, are outlined in each of the Guideline documents appended to this report.

9.7 MONITORING AND EVALUATION OF COMPLIANCE AGAINST RECOGNIZED STANDARDS

Regular monitoring and measurement of performance related to the control of Aviation Safety and HSE aspects and hazards is critical towards understanding current state and ensuring a process of effective continual improvement in performance. In addition, processes to ensure compliance against legislative requirements and accepted international best practices is critical.

Where Environmental Guidelines have been implemented at a specific airport site, or in relation to a defined activity being conducted, compliance with Guideline requirements, or the requirements of any site specific procedures that have been developed, should be periodically evaluated.

In the context of the SMS, the annual Management Review as well as the Audit Process (internal and external as appropriate) detailed in the generic SMS Manual provided in **Appendix A** and **Appendix B** provide for the necessary monitoring and evaluation of compliance.

9.8 REVIEW AND REFOCUSSING OF EFFORTS

The BCAD SMS and HSE Guidelines should be reviewed periodically to ensure their continuing suitability, adequacy and effectiveness related to improving performance and controlling potential aspects and hazards at the Family Island Airports. Reviews should include assessment of the need for changes to the Guidelines, and/or the policy commitments made in the organisation's mission statement, as well as opportunities for improvement.

Appendix A – Generic Safety Management System Manual: Tier 1 and Tier 2 Airports

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[Airport Name]
Safety Management System
Manual

Bahamas Family Islands Airports

Tier 1 [Tier 2] Airport

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FOREWORD

Safety has always been the overriding consideration in all aviation activities. This is reflected in the aims and objectives of ICAO as stated in Article 44 of the Convention on International Civil Aviation (DOC 7300), commonly known as the Chicago Convention, which charges ICAO with ensuring the safe and orderly growth of international civil aviation throughout the world.

In 2000, the International Civil Aviation Organisation (ICAO) Air Navigation Commission commenced the process to amend Annex 14, Volume I, Aerodrome Design and Operations. New aerodrome licensing and certification requirements called for the development and implementation of a safety management system (SMS). As of 24 November 2005, an ICAO certified Aerodrome shall have in operation a safety management system (SMS). As of 14 November 2013, ICAO has implemented the first edition of Annex 19. This new Annex is a combination of existing overarching safety management provisions that highlights the importance of safety management at the State level, and enhances safety by consolidating safety management provisions applicable to multiple aviation domains into a single Annex as opposed to the current six Annexes. Annex 19 facilitates the future evolution of safety management provisions, it promotes aligned implementation of the SMS and a State Safety Programme (SSP), and it creates a process to collect and analyse feedback regarding the implementation of the SMS and SSP. *Note that ICAO refers to airports as "aerodromes", and uses "States" to refer to ICAO signatory countries, which includes The Bahamas.*

In accordance with ICAO guidance, a SMS shall document and comply with processes to:

- Identify safety hazards;
- Ensure that remedial actions necessary to mitigate the risks/hazards are implemented; and
- Provide for continuous monitoring and regular assessment of the safety level achieved.

An organisation's SMS shall also clearly define lines of safety accountability, including a direct accountability for safety on the part of senior management (Accountable Executive) with control over the necessary resources (financial and human) to ensure the continuous effective operation and improvement of the SMS.

The BDCA, through the promulgation of its Sate Safety Programme (SSP) requires that all airport operators implement a SMS. The airport's SMS shall be reviewed by the BCAD as a sub-set of the overall Aerodrome Manual as required under Section 21.520, and detailed in Section 21.587 and Appendix 5 to 21.497: Aerodrome Administration and Safety Management System, of Schedule 21 of the BASR.

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IV DEFINITIONS

Accident: "Accident" includes any fortuitous or unexpected event by which the safety of an aircraft or any person is threatened (from the Bahamas Civil Aviation Act).

Airside Personnel: Persons assigned duties on airside that are either employees of the airport operator or those persons employed by third-party airside operators, including fixed-base operators, ground handling agencies, airlines and other organisations that perform activities independently at the airport in relation to flight or aircraft handling.

BCAD: Bahamas Civil Aviation Department

Cost: Activities, both direct and indirect, involving any negative impact, including money, time, labour, disruption, goodwill, political and intangible losses.

Hazard: A source of potential harm or a situation with a potential to cause loss.

Incident: An occurrence, other than an accident, associated with airside operations which affects, or would affect, the safety of operation.

Likelihood: Used as a qualitative description of probability or frequency.

Monitor: To check, supervise, observe critically, or record the progress of an activity or system on a regular basis in order to identify change and track performance.

NOTAM: Notice to Airmen (NOTAM) is a notice filed with an aviation authority to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight. NOTAMs contain information concerning the establishment, conditions or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel and systems concerned with flight operations.

Probability: The likelihood of a specific outcome.

Quality assurance: All those planned and systematic actions necessary to provide adequate confidence that a system, component, or facility will perform satisfactorily in service.

Risk: The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood.

Risk analysis: A systematic use of available information to determine how often specified events may occur and the magnitude of their consequences.

Risk assessment: The overall process of risk analysis and risk evaluation.

Risk evaluation: The process used to determine risk management priorities by comparing the level of risk against predetermined standards, target risk levels or other criteria.

Risk identification: The process of determining what can happen, why and how.

Risk level: The level of risk calculated as a function of likelihood and consequence.

Risk management: The culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects.

Runway Incursion: Any occurrence at an airport involving an aircraft, vehicle, person or object on

the ground that creates a collision hazard or results in the loss of separation with an aircraft taking off, intending to take off, landing or intending to land (US FAA).

Safety: Safety is the state in which the risk to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management (ICAO, Schedule 21 of the BASR).

Safety Deficiency: An unsafe condition or underlying factor with risks for which the defences are less than adequate.

Serious Incident: An incident involving circumstances indicating that an accident nearly occurred.

Safety Management: A systematic approach to managing a safety system (SMS) including the necessary organisational structures, accountabilities, policies and procedures.

Safety Management System: A system for the management of safety at aerodromes, including the organisation structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for the control of safety at, and the safe use of, the aerodrome (Schedule 21, BASR).

Wildlife hazard. A potential for damage to aircraft through collision with birds or animals on or near an aerodrome.

V INTRODUCTION

GENERAL DESCRIPTION OF [Airport Name] OPERATIONS

[Airport Name] is an airport which receives both private and commercial aircraft for the transport of passengers with more than ### movements (take-offs or landings) annually. It is located XX minutes from [nearest town] and occupies an area of approximately XXX hectares. The airport is currently served by scheduled flights.

The airport has a single runway that is XXXX ft. by XXX ft. It is laid out [provide orientation]. The airport is equipped with lighting which serves the runway, although only for emergencies.

The airport currently has the vocation of a general aviation airport and its XXXXX annual movements are primarily due to smaller aircraft of all types. The airport regularly handles [aircraft type] aircraft.

SMS FRAMEWORK

As defined by ICAO, the four basic building blocks and twelve elements of the safety management system are:

1. Safety policy and objectives
    1.1. Management commitment and responsibility
    1.2. Safety accountabilities and responsibilities
    1.3. Appointment of key safety personnel
    1.4. Coordination of emergency response planning
    1.5. SMS process and documentation
2. Safety risk management
    2.1. Hazard identification
    2.2. Risk assessment and mitigation
3. Safety assurance
    3.1. Safety performance monitoring and measurement
    3.2. The management of change
    3.3. Continuous improvement of the SMS
4. Safety promotion
    4.1. Training and education
    4.2. Safety communication

This structure is in alignment with the details provided in Sections 21.155 and 21.310 of Schedule 21 of the BASR that form the target structure of the Bahamas Family Islands Airports SMS manuals.

APPLICATION OF MANUAL CONTENT

This Safety Management System was developed based on the requirements of ICAO Annex 19 as

specified in Schedule 21 of the BASR and is relevant to the operations of the BCAD Airports in the Bahamas Family Islands. Nothing contained in this manual is meant to supersede any standard, order, instruction or recommendation issued by the Director Civil Aviation. In the event any discrepancy is noticed in the material contained in this manual and that published by the regulators, the reader is advised to bring the same to the notice of the Airport Manager so that a suitable amendment can be issued.

A safety management system takes into account that there will always be hazards and risks. The implementation of this document will help [Airport Name] proactively manage and control the threats before they lead to mishaps. The implementation of a SMS represents a change in the safety culture of an organisation. This change will not occur overnight and will take the commitment of all concerned parties in order to be fully implemented. The management of the Bahamas Family Islands Airport Authority is committed to the further development of this SMS document which will direct the management of the SMS at [Airport Name].

TARGET AUDIENCE

Application of the material herein is not limited to operational personnel. Rather, it is relevant to the full spectrum of [Airport Name] employees and customers involved in safety, including management.

USING THIS MANUAL

The purpose of this manual is to assist all those who work at, work with or visit [Airport Name] in fulfilling the requirements of ICAO Annexes 6, 11, 14, and 19 with respect to the implementation of SMS. In particular, this material is aimed at personnel who are responsible for designing, implementing, managing, and performing safety activities, namely:

- [Airport Name] officials with responsibilities for compliance with BCAD regulations;
- [Airport Name] operational staff;
- Management of operational organisations, such as operators, Security personnel, concessionaires, maintenance organisations, contractors; and
- Managers and staff of organisations conducting operations with the potential to affect safety at the airport.

Users should find sufficient information herein for operation of an effective SMS.

SECTION 1 – SAFETY POLICY AND OBJECTIVES

Section 21.310 (Safety Management System) of Schedule 21 of the BASR requires that the Airport Manager (aerodrome operator is used interchangeably in the Regulation) establish a Safety Management System (SMS) for the aerodrome describing the structure of the organisation and the duties, powers and responsibilities of the officials in the organisational structure with a view to ensuring that operations are carried out in a demonstrably controlled way and are improved where necessary. It further specifies that all the users of the aerodrome, including fixed-base operators and those performing activities independently at the aerodrome in relation to flight or aircraft handling, are to comply with the requirements of the aerodrome operator with regard to safety and order at the aerodrome and shall monitor such compliance. The aerodrome's SMS strategy and planning shall include:

- Setting safety performance targets;
- Allocating priority for implementing safety initiatives;
- Providing a framework for controlling safety risks to a level as low as reasonably practicable having regard to the requirements of the Standards and Recommended Practices in ICAO Annex 14 Volume 1 and applicable regulations, standards, or other guidance material; and
- Methods for promulgating information and ensuring competence within the SMS.

The Regulation obliges all the users of the aerodrome, including fixed-base operators and organisations referred to above, to cooperate in the programme to promote safety and order at, and the safe use of, the aerodrome by immediately informing it of the accidents, incidents, defects and faults which have a bearing on safety.

1.1 Management Commitment and Responsibility

While the elimination of all accidents and incidents is desirable, a one hundred percent safety rate is an unrealistic goal. Failures and errors will occur, in spite of best efforts to avoid them. No human activity or human-made system can be guaranteed to be absolutely safe, i.e. free from risk. Safety is a relevant notion whereby inherent risks are acceptable in a "safe" system.

Safety management is increasingly viewed as a management of risks. The primary purpose of the [Airport Name] Safety Management System Manual (SMS Manager) is to implement a system under the control of the SMS Manager to ensure compliance with relevant ICAO and BCAD requirements on safety management. In recognition of the importance that BCAD places on safe operations, the following policy and objectives for safety in all areas under its control is hereby released and will be immediately incorporated into all processes and functions at the airport.

SAFETY POLICY

Safety is one of our core business functions. We are committed to developing, implementing, and improving strategies and processes to ensure that all our aviation activities uphold the highest level of safety performance and meet national and international standards. We will report incidents, train staff on safety management procedures, and strive to make continuous proactive improvement to the overall level of safety performance in our organisation. All levels of the organisation and all employees are accountable for the delivery of this highest level of safety performance, starting with the [Accountable Executive], the General Manager Airport Authority.

Our commitment is to:

- **Support** the management of safety by creating an organisational culture that encourages safe practices, effective safety reporting and communication, and actively manages safety with the same attention to results that is used in managing all systems that can cause bodily harm or destruction to property.
- **Enforce** the management of safety as the primary responsibility of all employees.
- **Clearly define** for all staff their accountabilities and responsibilities under the safety management system (SMS).
- **Establish** and operate hazard identification and risk management programmes, including a hazard reporting system, in order to decrease or eliminate hazards resulting from our operations or activities.
- **Ensure** that no action will be taken against any employee who discloses a safety concern through the hazard reporting system unless such disclosure indicates, beyond any reasonable doubt, an illegal act, gross negligence, or a deliberate or wilful disregard of regulations or procedures.
- **Comply** with, and wherever possible exceed, legislative and regulatory requirements and standards.
- **Ensure** sufficient number and training of personnel to a level of competency to be able to implement safety strategies and processes, and are allocated only tasks commensurate with their skills.
- **Establish** and measure our safety performance against realistic safety performance indicators and safety performance targets.
- **Continually improve** our safety performance through management processes that ensure relevant safety action is taken and is effective.
- **Ensure** externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

_____

General Manager Airport Authority
Accountable Executive

[Airport Name] SAFETY OBJECTIVES:

Achievement of continuous improvement from the safety policy will require commitment to the following objectives:

- **Safety Management System**. Appoint a Manager for the Safety Management System to oversee the development and implementation of the programme and ensure that the application of the SMS is integral to all our aviation activities;
- **Safety Culture**. Develop and embed a safety culture in all our aviation activities that recognizes the importance and value of effective aviation safety management and acknowledges at all times that safety is paramount;
- **Safety Accountabilities**. Clearly define for all staff their accountabilities and responsibilities for the development and delivery of aviation safety strategy and performance. Ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters and are only allocated tasks commensurate with their skills;
- **Risk Management**. Minimize the risks associated with aircraft operations to a point that is As Low As Reasonable Practicable (ALARP) and establish and measure our safety performance against realistic objectives and/or targets;
- **Regulatory Compliance**. Actively develop and improve our safety processes to conform to ICAO and BCAD standards. Comply with and, wherever possible, exceed legislative and regulatory requirements and standards. Ensure that externally supplied systems and services that impact upon the safety of our operations meet appropriate safety standards;
- **Human Resources**. Ensure that sufficient skilled and trained resources are available to implement this safety policy and continually improve our Safety Performance; and
- **Safety Oversight**. Conduct safety audits, including incident and accident investigations, and management reviews and ensure that relevant action is taken and documented.

1.2 Safety Accountabilities and Responsibilities of Managers

Responsibility and accountability are interlinked. While individual staff members are responsible for their actions, they are also accountable to their supervisor or manager for the safe performance of their functions. Although individuals must be accountable for their own actions, managers and supervisors are accountable for the overall performance of the group that reports to them. Managers are also accountable for ensuring that their subordinates have the resources, training, experience, etc. needed for the safe completion of their assigned duties.

Safety management is an integral part of all employees' day-to-day jobs. All team members are responsible for the smooth running of the Safety Management System (SMS) and for maintaining safety. The day-to-day management of safety at [Airport Name] will be coordinated by the SMS Manager (Airport Manager). The four essential functions of safety management are:

- Management and monitoring of the hazard identification system;
- Performance monitoring of the safety of airport operations;
- Communicating safety management needs to the Accountable Executive (AE); and
- Provide assistance to the members of the team in all aspects of safety management.

All personnel must report hazards and incidents, so that measures are taken to minimize or eliminate these hazards, learn from these events and avoid their recurrence. Ultimate responsibility for safety at [Airport Name] rests with the General Manager Airport Authority as the AE.

Figure 1 below shows the Organisation of [Airport Name] Safety Management System (SMS) and its integration with the rest of the organisation. Roles and responsibilities under the SMS are described in detail further.

FIGURE 1 - Organisation of [Airport Name] and SMS key roles

1.2.1 Accountable Executive

The Accountable Executive (AE) is the General Manager Bahamas Family Islands Airports Authority (Airport Authority). The AE has the responsibility of ensuring the implementation and the efficient functioning of the SMS. This responsibility means, among other things, that the AE:

- Develops and actively promotes the safety policy;
- Approves the SMS manual;
- Establishes a system for safety management education and safety awareness;
- Establishes a safety audit and surveillance system and participates in the Management Review periodically;
- Acts as an effective interface with the BCAD regarding safety matters;
- Participates in safety relations with international bodies including ICAO;
- Provides the resources necessary for the implementation and management of the SMS;
- Implements the appropriate controls over financial activities to ensure the safety of all airports in the Bahamas Family Islands is not compromised by changes to the financial system;
- Provides the resources necessary to ensure that all employees receive training in SMS and they receive the training needed to perform their duties in a safe manner;
- Ensures the development of personnel policies, personnel management and placement of personnel most suited for the task and having the correct attitude towards operational safety;
- Demonstrates leadership by actively and visibly participating in strategic events related to the SMS;
- Actively promotes and encourages a positive culture of safety at [Airport Name];
- Contributes to the development of the strategic safety objectives and participates in their review;
- Ensures that critical safety issues are reported in a timely manner to the Director of Civil Aviation;
- Ensures the development of safety standards; and
- Ensures the continuous improvement of the SMS through the review of the annual management review.

1.2.2 Safety Management Systems Manager (SMS Manager)

The SMS Manager is the Airport Manager. The SMS Manager is responsible to the AE for the implementation and day-to-day management of the SMS. The SMS Manager:

- Is responsible for implementing the SMS plan and maintaining the SMS;
- Assumes the leadership role to ensure commitment throughout [Airport name] to the safety

management policy intent and safety management system requirements;

- Manages all safety requirements including procedures for identifying, reporting, tracking and correcting safety issues;
- Ensures that staff are trained, qualified and competent to discharge their safety related obligations;
- Promotes safety management training across all airport staff;
- Keeps the SMS Manual up to date and distributes changes to those responsible for the manuals
- Advises the AE on safety matters;
- Ensures that safety issues are reported in a timely manner to the AE;
- Performs/facilitates hazard identification and safety risk analysis
- Manages the SMS reporting system;
- Coordinates investigations on the SMS reports as appropriate;
- Reviews investigation of accidents, and incidents to promulgate lessons learned;
- Ensures the implementation of corrective measures resulting from the analysis of SMS reports and evaluates their effectiveness;
- Ensures that all staff are aware and held accountable for their safety performance; and
- Ensures the proper maintenance of pavements (runways, taxiways, aprons, etc. as appropriate), airport terminals and other airport services including landscaping and wildlife hazard mitigation.

1.2.3 Airport Chief of Fire Rescue

The Airport Fire Chief is responsible for the implementation of the Emergency Preparedness Plan (EPP). The Fire Chief is responsible to the Airport Manager for the effective management of the Firefighting personnel. The Fire Chief is responsible for:

- Promoting the Safety Policy and Objectives as well as the reporting of incidents, accidents, hazards, and dangers;
- Ensuring that the firefighting team complies with all of the requirements of the SMS ;
- Actively participating in the development of safety policies and procedures that fall under the application of the EPP as it relates to safety;
- Actively participating in SMS training and promoting the same to the firefighting staff; and
- Keeping the Airport Manager informed of any changes or staff/equipment restrictions that may have a negative impact on airport safety.

1.2.4 Airport Chief of Security

The Airport Chief of Security (Security Manager) is responsible for the implementation of the Airport Security Programme. The Security Manager is responsible to the Airport Manager for the effective

management of security personnel as well as for the control of all personnel on the air side. The Security Manager is responsible for:

- Promoting the Safety Policy and Objectives as well as the reporting of incidents, accidents, hazards, and dangers;
- Ensuring that the Security team complies with all of the requirements of the SMS;
- Actively participating in the development of safety policies and procedures that fall under the application of the Security programme as it relates to aviation safety;
- Actively participating in SMS training and promoting the same to the security staff; and
- Keeping the Airport Manager informed of any changes or staff/equipment restrictions that may have a negative impact on airport safety.

1.3 Appointment of Key safety personnel

Given the total costs of aviation accidents, many groups have a stake in improving the management of safety. The principal stakeholders in safety at [Airport Name] are listed below:

- Civil Aviation regulatory authority (Airport Authority);
- Airport Manager;
- Aircraft owners and operators (Airlines, Airside Concessionaires);
- International Civil Aviation Organisation (ICAO);
- All airport staff; and
- The flying public.

All personnel should display attitudes and behaviours which reflect the primacy of safety at [Airport Name] operations. Each person has a duty to identify and report factors or events which may impact safety of operations. Safety starts at the top. Therefore senior management at BCAD, through all levels of management, must lead by example and provide an ambience and forum for open and unencumbered communication of safety concerns by all staff. Non-punitive reporting is a cornerstone of any safety management programme. All levels of management must be open to employee safety concerns and promote and ensure that there is no punitive fallout for the reporting of safety concerns. All employees must feel free to report any safety concerns they have and have an expectation that they will be heard, that their concerns be taken seriously and that their career or employment will not be affected.

1.3.1 All Airport Personnel Responsibilities

All Civil Aviation employees are responsible for working safely and following SMS procedures. All employees are also responsible to look for and report safety risks and hazards as well as those procedures which could result in, or which have resulted in safety risks, even if they have been committed by themselves. Finally, employees shall participate in an open and constructive way, in all SMS activities that affect them, including for example SMS training, hazard assessments and reviews, investigations of root causes, the development of corrective measures and their application as needed.

All personnel of [Airport Name], both regular and occasional employees, shall apply the principles of the SMS on a daily basis. Their responsibilities include, but are not limited to the following:

- Actively participate during SMS training sessions;
- Identify hazards and assist in their analysis as needed;
- Participate, if necessary, in investigations of incidents and accidents related to safety;
- Assist in developing corrective measures;
- Apply corrective measures in place;
- Apply system safety measures as required by safety management procedures and instructions; and
- Advise the Airport Manager, or their supervisor, of any safety occurrence or system failure and to identify and report any situation of potential risk or concern affecting system safety via one of the following means:
    - Submitting either an Incident/Accident report or a Confidential Report;
    - Supporting safety audits as and when they occur; and
    - Supporting safety investigations as and when they occur.

1.4 SMS Implementation Plan

The SMS Implementation Plan for [Airport Name] will be phased-in over a three year period in accordance with the four-phase approach recommended by ICAO. The Implementation Plan will be initially developed by the BCAD Airport Authority and implemented through the SMS Manager.

1.5 Coordination of the Aerodrome Emergency Plan

Emergency Planning will be performed in accordance with Bahamas Civil Aviation (Safety) Regulation Schedule 21 (Aerodrome Standards & Certification) Section 21.380 (Aerodrome Emergency Planning). The Aerodrome Emergency Plan (AEP) developed for the [Airport Name] is prepared under separate cover in compliance with Section requirements in Section 21.557 of Schedule 21 of the BASR.

The AEP is designed to meet the standards of International Civil Aviation Organisation (ICAO) Annex 14, Aerodromes, Volume I, Aerodrome Design and Operations Chapter 9.1 Aerodrome Emergency Planning as well follow guidance from Code of Federal Regulations (CFR) Part 139, Advisory Circular 150/5200-31C, Airport Emergency Plan to minimize the possibility and extent of personal injury and property damage on the airport in an emergency. It establishes an Emergency Management Organisation and assigns functions and tasks consistent with the Incident Command System (ICS) organisation structure. It provides the framework for coordination and full mobilization of airport and external resources. It clarifies strategies to 1) prepare for, 2) respond to, and 3) recover from an emergency or disaster.

Key responsibilities for the coordination of the emergency plan are described in the AEP Manual. Depending on the emergency, the following individuals will have a role to play:

- Island Administrator or Representative;

- Aircraft Fire Rescue personnel;
- Police;
- Airport Manager; and
- Security Manager.

1.6 SMS Documentation

1.6.1 Data reporting

The primary objective of aviation safety at an airport is to avoid collisions and or strikes involving persons, aircraft or vehicles on the manoeuvring area that will result in death or injuries to persons. Success in meeting our goals and implementing our programmes will be reported annually to all personnel. To achieve our goals, the [Airport Name] will implement detailed safety policies and practices, training and safety communication programmes. Indicators of the implementation of safety programmes, practices and training will be reported annually. Key indicators include, for example:

- Number and percentage of new airport personnel who received safety awareness training;
- Number and percentage of existing airport personnel who received refresher safety training;
- The number of formal concerns addressed and not addressed within one month;
- The number of incident and accident reports addressed and not addressed within one month;
- A listing of periodic safety bulletins that were issued;
- A summary of new or revised safety practices and procedures that were developed and issued;
- A summary of communications initiatives taken during the year;
- A summary of special safety training seminars such as manual lifting, use of new equipment, etc., that were held and who attended; and
- A summary of audit and monitoring reports and actions taken.

The Airport Manager is responsible for preparing an Annual Safety Report that will address the key indicators and how well the airport has met its safety objectives.

1.6.2 Document and Data Record Keeping

Table 1 presents a list of the documents and records that relate to the [Airport Name] SMS. In general, hazard and incident/accident reports and records (Safety reports) and any other report related to the SMS and from the various airport manuals (operations manual, wildlife management plan, and aerodrome emergency plan) are kept in the airport administration office. Specific control lists, at the beginning of each document, facilitate their control. The SMS Manager ensures the effective control of records.

All original records are retained as stipulated in Table 1. Record keeping ensures that:

- The files are readable and clearly identify their origin;

- Files are stored to ensure their integrity;
- Records are retained in 'paper' or electronic format in a clearly identified central, SMS file; and
- Records are reviewed annually during the management review to ensure their maintenance, their quality, and their relevance.

Table 1. List of Safety-Related Documents and Records

Title	Found in:
Safety Report Form	SMS Manual, Appendix A
Completed Safety Reports	Manager's office
Training calendar	Manager's office
Training files	Personnel files
Wildlife Management Activities Register and annual report (Wildlife Management Plan)	Manager's office
Report on the state of the runway and taxiways	Manager's office
NOTAMs	Manager's office

Schedule 21 of the BASR established record keeping for multiple documents/records that are required under the SMS. Although the minimum retention time for many of these records is 24 months, the following records will be kept for a period of 5 years:

- The original SMS documents and subsequent revisions;
- Risk assessments and associated action plans;
- Safety Hazard Reports;
- Safety Observations Report;
- Accident and Incident Analysis Forms;
- Annual Safety Reports;
- Airport Airside Safety Directives, Policies, Practices and Rule;
- Safety Bulletins;
- Description of Training Programmes, who attended and when; and
- Operational and maintenance records.

All mandatory incident and accident reports will be kept for at least 5 years. If there is a legal action outstanding or anticipated regarding an incident or accident, then they will be kept until the legal action is completed.

1.6.3 SMS Reporting Systems

Safety management systems involve the reactive and proactive identification of safety hazards. Accident investigations reveal a great deal about safety hazards; but fortunately, aviation accidents are rare events. They are, however, generally investigated more thoroughly than incidents. Research leading to the 1:600 Rule showed that the number of incidents is significantly greater than the number of accidents for comparable types of occurrences. The causal and contributory factors associated with incidents may also culminate in accidents. Often, only good fortune prevents an incident from becoming an accident. Unfortunately, these incidents are not always known to those responsible for reducing or eliminating the associated risks. This may be due to the unavailability of reporting systems, or personnel not being sufficiently motivated to report incidents.

1.6.3.1 Need for Safety Reports

Knowledge derived from incidents can provide significant insights into safety hazards. Safety reports systems should not just be restricted to incidents, but should include hazards, i.e. unsafe conditions that have not yet caused an incident. Data from such reports facilitates an understanding of the causes of hazards, helps to define intervention strategies and helps to verify the effectiveness of interventions. Depending on the depth to which they are investigated, incidents can provide a unique means of obtaining first-hand evidence on the factors associated with mishaps from the participants.

1.6.3.2 Statutory requirements

The Bahamas Civil Aviation State Safety Programme (SSP) and SMS requirements established by ICAO, and adopted under Schedule 21 of the BASR, require each airport to establish an incident reporting system to facilitate the collection of information on actual or potential safety deficiencies. In addition, personnel are encouraged to submit voluntary incident reports which:

- ✈ Facilitate collection of information that may not be captured by a mandatory incident reporting system;
- ✈ Is non-punitive; and
- ✈ Affords protection to the sources of the information.

Non punitive reporting is a cornerstone of any safety management programme. Management must be open to employee safety concerns and promote and ensure that there is no punitive fallout for the reporting of safety concerns. All employees must feel free to report any safety concerns they have and have an expectation that they will be heard, that their concern take seriously and that their career or employment will not be affected. As part of the education process, the SMS will ensure that staff is made aware that they will not be penalized for submitting a report and their confidentiality will be protected if require.

1.6.3.3. Mandatory incident reporting

At [Airport Name], it is mandatory to report any incident involving an unsafe, or potentially unsafe, occurrence or condition, irrespective of whether it involves injury or property damage or not. The report is to be submitted to the Airport Manager as soon as possible after the occurrence/ incident,

but in any case not later than 24 hours after the incident. The accident/incident reports may be submitted in the format placed in **Appendix A** to this manual, or in any other format the user finds more suitable. The person reporting, at own discretion, may or may not disclose his/her identity. It is mandatory to report the following occurrences:

- Bird strike of an aircraft;
- Abnormal bird concentrations;
- Failure of Navigational/Landing Aids;
- Failure of Communication Services;
- Failure of airport lighting systems;
- Failure of any facility and procedure used in airside operations;
- Runway obstructed by foreign object;
- Presence of any wild animal in the operational area and likely to affect safe operations;
- Going round of an aircraft on final approach due to runway not being available;
- Major deterioration of services in airport manoeuvring area;
- Collision between moving aircraft and vehicles or any other ground equipment;
- Collision between vehicles or vehicles and ground support equipment (GSE);
- Fuel spillage;
- Apron jet blast/turbo prop blast incident;
- Breaches of airside driving rules resulting in hazards to aircraft;
- Failure to detect an unserviceable condition of airside facilities;
- Any incident of fire which either necessitates use of fire extinguishers or causes failure of any equipment or facility or disturbs smooth flow of air traffic or passengers or visitors; and
- Any incident that has jeopardized safety of passengers/public and was avoided.

1.6.3.4 Mandatory Reporting to SMS Manager/BCAD

In addition to the reporting mechanisms described previously, some incidents and accidents require mandatory reporting to the SMS Manager and the BCAD, for the purpose of complying with the BCAD SSP and Schedule 21 of the BASR. Mandatory reporting is required for:

- Any accident or event that results in a fatality, injury or illness to person or damage to property or the environment;
- An event which if not corrected would likely endanger people, property or the environment, or an incident involving circumstances indicating that an accident nearly occurred. The following are examples of these types of incidents:
    - Failure or significant malfunction of airfield lighting;
    - Runways or aircraft manoeuvring areas obstructed by aircraft, vehicles or foreign

objects, resulting in a hazardous or potentially hazardous situation;

- Runway incursions;
- Errors or inadequacies in marking of obstructions or hazards on runway or aircraft manoeuvring areas;
- Collision between a moving aircraft and any other aircraft, vehicle or other ground object;
- Jet or prop blast incidents that could have resulted in significant damage or serious injury;
- FOD and wildlife on the runway that strikes an aircraft; and
- When an aircraft was, or could have been, endangered by the impairment of any member of ground staff.

The SMS Manager is responsible for ensuring that a Mandatory Safety Report is prepared when required. In some cases, the airline, air traffic service, the ground handling company, etc. may actually prepare the report and submit to the SMS Manager and the BCAD. In other cases, the SMS Manager will have to prepare the report with the input of those that witnessed or observed the incident or accident. In all cases the report will be submitted as soon as practicable and by the quickest means practicable. Notwithstanding the requirements to actually prepare and file a Mandatory Report, it is the responsibility of every person working at the airport that observes or witnesses a mandatory incident or accident to inform the SMS Manager, or their respective supervisor of the details of the incident or accident immediately.

1.6.3.4 Voluntary Reporting

Any person working at the airport may and is encouraged to report what they see as a potential safety hazard or concern which could lead to an accident, damage or injury. Examples include: inadequate escorts for arriving or departing passengers, airside personnel potentially exposed to jet/prop blast, vehicles left unattended on the apron, confusing signs, poor lighting, etc. The person who wants to make a report may do so by verbally telling the SMS Manager about his or her concern. A verbal report can be made to the SMS Manager or their supervisor at any time. The person may also decide to prepare and submit a written report to the SMS Manager. The person making the report can further elect whether to provide his or her name on the written report. The SMS Manager will maintain the confidentiality of the person making a report. If a report is received verbally, the SMS Manager will note the verbal report on his Safety Observation Report described subsequently without indicating who provided the report unless that person provides his or her approval to do so. Further, depending on the severity of the hazard or concern, recommendations will be made or action taken to mitigate the hazard as quickly as possible. Once the SMS Manager receives a verbal or written report, the SMS Manager will investigate the potential hazard, analyse the potential risk, and determine what action, if any, is required. For written reports, the SMS Manager will provide feedback to the originator that the concern or potential hazard has been analysed and that appropriate action has been taken, or why no action was taken if appropriate. This information will be recorded in the follow-up section of the Safety Report.

1.6.3.5 Handling Safety Reports

The safety reports received will be handled with absolute confidentiality as far as the names and identities of those involved are concerned. The reports which are mandatory to be transmitted to the Airport Authority would be transmitted and followed up with a brief investigation report, where applicable.

In any case, each report would be investigated, analysed and entered in log (**Appendix B**). The logs will be reviewed annually during the management review and analysed to see if any trends or re-occurring issues warrant the review of safety measures. This would then be documented and acted upon accordingly. In order to ensure build-up of user confidence in the SMS, it is important to provide feedback to the reporting agency or employee on what action, if any, was taken on the report. It is important to remember that this feedback is even more important when no action was taken since in the absence of any visible action, the users may lose confidence in the system and stop reporting matters altogether. In the event the report received was anonymous, this feedback may be communicated in a general staff meeting, or circulated in the form of a notice board entry/e-mail containing a brief statement of the problem and action taken to resolve the same without referring to the fact that the same was consequential to an anonymous report.

1.6.4 Safety Violations

Although the [Airport Name] supports a "no-blame" accident and incident reporting policy, the [Airport Name] will not tolerate violations of certain safety rules at the airport. Personnel safety violations include, but are not necessarily, limited to the following:

- Failure to report damage to an aircraft;
- Smoking airside, except in a designated area;
- Driving on the manoeuvring area without permission;
- Failure to report a potentially hazardous incident;
- Driving in front of or behind an aircraft with aircraft engines still running and/or anti-collision warning lights on;
- Parking in areas marked as parking unsafe or prohibited; and
- Leaving a vehicle unattended with the engine running on movement area.

Depending on the safety violation and previous history of the offender, the following are examples of disciplinary action that may be taken:

- Verbal caution, not recorded;
- Formal verbal caution, recorded on personal employment file;
- Formal written caution, recorded on personal employment file for a specified period;
- Temporary airside driving ban for driving offences with requirement for retraining and testing;
- Permanent airside driving ban, for serious or persistent driving offences; and
- Temporary or permanent withdrawal of airside pass, or disciplinary action leading to downgrading, suspension or dismissal.

SECTION 2 – SAFETY RISK MANAGEMENT

2.1 Hazard Identification

The SMS Manager plays a key role and is central to the identification of hazards. As part of his or her daily responsibilities, the SMS Manager is expected to spend a portion of his or her time physically touring the airport and its landside facilities as well as maintaining a presence on airside working areas. Operational tempo and manpower could dictate how much time will be spent in these activities. While there, the SMS Manager's role includes the observation of operations, maintenance and construction activities to ensure that safe practices and procedures are being followed. The SMS Manager is also expected to talk with any available personnel working on the airport to determine if they have any safety concerns or questions. A combination of this personal approach and an effective reporting system should identify a large portion of the hazards that exist. As the programme matures and data is collated, trend analysis can become an effective source of hazard identification.

2.1.1 Hazard Reporting

In the event that an accident or incident occurs and the SMS Manager is not available, notify airport security who will respond and record the appropriate information as needed. It is still the responsibility of the reporter of the incident or accident and their immediate supervisor to ensure that the SMS Manager is notified of the occurrence within 24 hours. These procedures are very important to ensure timely investigation of the occurrence and for all concerned to benefit the most from lessons learned as a result of the occurrence. The following sections are for information purposes and relate to airside occurrences.

2.1.2 Hazard Investigations

The sole objective of the investigation of an occurrence shall be the prevention of future occurrences. It is not the purpose of this activity to assign blame or liability. For accidents, the AE may order the investigation by general or special order and appoint any person for the purpose of carrying out such investigation.

Depending on the size and complexity of the investigation, nature of accident and investigation skills available, BCAD may constitute appropriate groups as contained in guidelines on ICAO Doc 9756 Vol. I after obtaining information from site and analysing the preliminary information and evidences on the accident. In addition, the BCAD may order the investigation of any serious incident involving an aircraft or a person associated with the maintenance and operation of aircraft, or both. Incidents other than the serious incidents shall be investigated by an office appointed by the MOTA.

2.1.3 Hazard Responsibility

The airport closest to the site of the accident/serious incident is responsible to immediately take all reasonable measures to protect the evidence and to maintain safe custody of the aircraft, including its parts and contents, until the arrival of the Inspector of Accidents/Inquiry Officer at the scene whenever an accident/serious incident occurs at a place under their jurisdiction. Action must be taken for arranging for guarding of the wreckage including the preservation, by photographic or other means, of any evidence which might be removed, effaced, lost or destroyed. This issue is more completely handled in the Airport Emergency Plan.

2.2 Risk Assessment and Mitigation

The purpose of identifying the hazards and assessing the airside risks is to determine whether enough has been done to prevent an incident or accident that may lead to fatalities, injuries and ill health, and/or damage to aircraft. Risk assessment can also indicate what improvements need to take priority, and thereby assist in developing budgets and business cases. A formal hazards identification and risk management process will be conducted:

- ✈ At least once a year;
- ✈ When major operational changes are planned; and
- ✈ When new facilities are going to be constructed.

2.2.1 The Seven Step Risk Assessment process

A seven step assessment process will be used for the hazards identification and risk management process. If the hazard has already been identified it will be necessary to start at step 3 of the seven step process described below:

- Step 1- Development of a complete description of the system to be evaluated and of the environment in which the system is to be operated;
- Step 2- Identification of hazards;
- Step 3- Estimation of the severity of the consequences of hazard occurring;
- Step 4- Estimation of the likelihood of a hazard occurring;
- Step 5- Evaluation of risk;
- Step 6- Mitigation of risk; and
- Step 7- Development of safety documentation.

For each hazard identified, the risk index is to be calculated based on the severity of the event and likelihood of occurrence as follows:

Qualitative Measures of Severity

Level	Aviation Definition	Meaning/Description
1	Insignificant	No injuries, low financial loss (little consequences).
2	Minor	Nuisance, operating limitations, use of emergency procedures, possible First Aid treatment required, medium financial loss.
3	Major	Serious incident, significant reduction in safety margins, medical treatment required (injury to persons), high financial loss.
4	Hazardous	Major equipment damage, serious injuries, large reduction in safety margins, major financial loss.
5	Catastrophic	Destruction of equipment, death, huge financial loss.

Qualitative Measures of Likelihood

Level	Likelihood	Description
5	Almost Certain	Is expected to occur in most circumstances.
4	Likely	Will probably occur at some time.
3	Possible	Might occur at some time.
2	Unlikely	Could occur at some time.
1	Rare	May occur in exceptional circumstances.

Risk Assessment Matrix

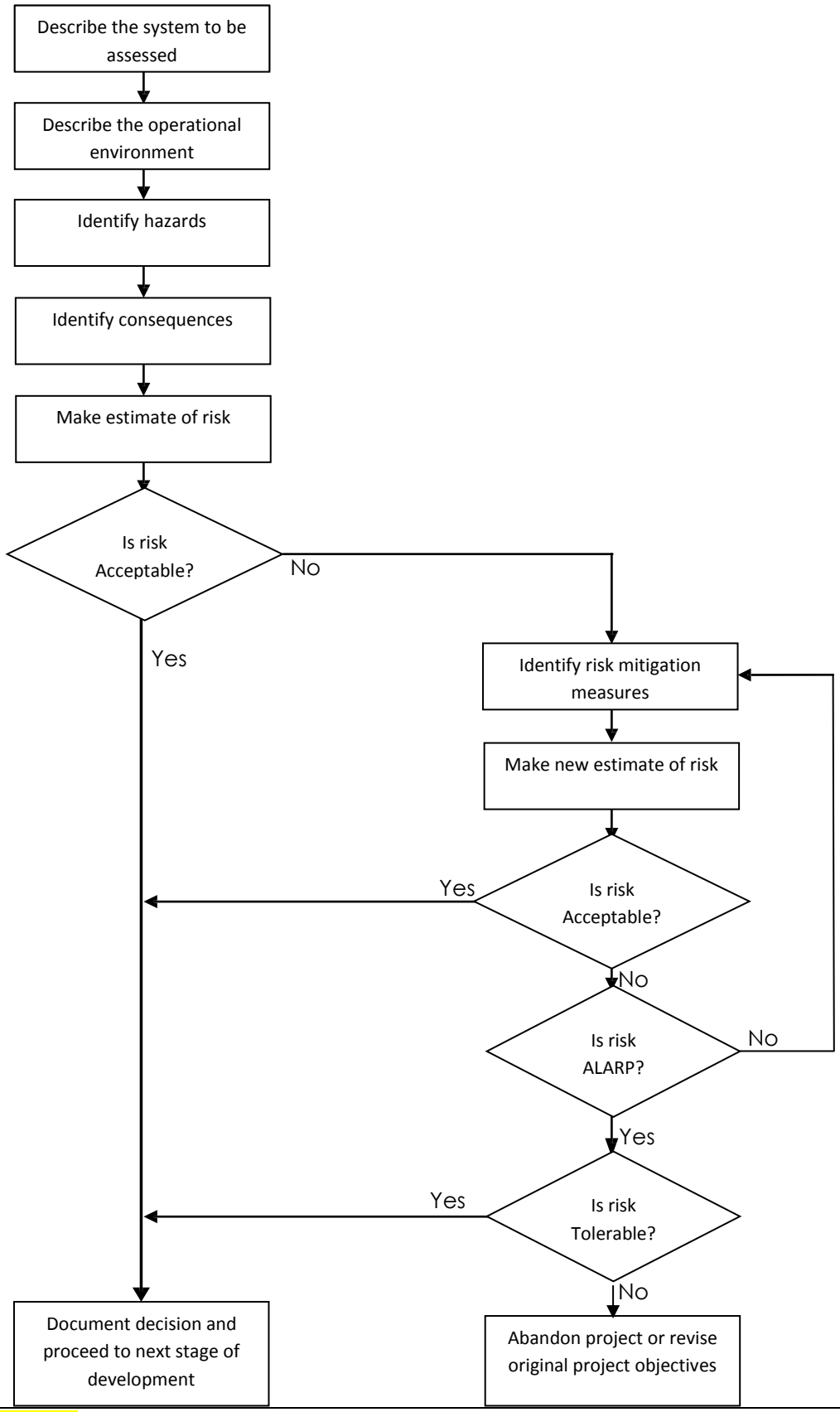
Likelihood		Consequence				
		Insignificant	Minor	Major	Hazardous	Catastrophic
		1	2	3	4	5
Almost certain	5	M	H	E	E	E
Likely	4	M	M	H	E	E
Possible	3	L	M	H	H	E
Unlikely	2	L	L	M	H	H
Rare	1	L	L	L	M	H

Resulting Risk Legend

E	Extreme risk, unacceptable under existing conditions, immediate action required
H	High risk, acceptable based on risk mitigation, senior management decision needed
M	Moderate risk, acceptable based on risk mitigation, management decision possible
L	Low risk; manage by routine procedures

The [Airport Name] Risk Register can be found in **Appendix C**. The register is used to keep track of all hazards identified at the airport, their associated level of risk as calculated using the ranking previously described, the associated mitigation measure(s) and the residual risk calculated post-implementation of the risk treatment/controls as validated by the SMS Manager.

The [Airport Name] SMS process for Risk Management and Safety Assessment is summarized in the flow chart below.



SECTION 3 – SAFETY ASSURANCE

3.1 Safety Performance Monitoring and Measurement

In any system, it is necessary to set and measure performance outcomes in order to determine whether the system is operating in accordance with expectations, and to identify where action may be required to enhance performance levels to meet these expectations.

The Acceptable Level of Safety (ALoS) expresses the safety goals (or expectations) of an oversight authority (BCAD), an operator or a service provider. It provides an objective in terms of the safety performance operators/service providers should achieve while conducting their core business functions, as a minimum acceptable to BCAD. It is a reference against which BCAD can measure safety performance. In determining an acceptable level of safety, it is necessary to consider such factors as the level of risk applicable, the cost/benefits of improvements to the system, and public expectations on the safety of the aviation industry. In practice, the concept of acceptable level of safety is expressed by two measures/metrics, i.e. safety performance indicators and safety performance targets, and implemented through various safety requirements. The following explains the use of these terms:

- ✈ Safety performance indicators are a measure of the safety performance of a department. Safety indicators should be easy to measure and be linked to the major components of a company's SMS. Safety indicators will therefore differ between departments, aircraft operators, airport concessionaires or ATS providers.
- ✈ Safety performance targets (sometimes referred to as goals or objectives) are determined by considering what safety performance levels are desirable and realistic for individual departments, operators, concessionaires or service providers. Safety targets should be measurable, acceptable to stakeholders, and consistent with SMS.
- ✈ Safety requirements are needed to achieve the safety performance indicators and safety performance targets. They include the operational procedures, technology, systems and programmes to which measures of reliability, availability, performance and/or accuracy can be specified.

The relationship between acceptable level of safety, safety performance indicators, safety performance targets and safety requirements is as follows:

- **Acceptable level of safety** is the overarching concept;
- **Safety performance indicators** are the measures/metrics used to determine if the acceptable level of safety has been achieved;
- **Safety performance targets** are the quantified objectives pertinent to the acceptable level of safety; and
- **Safety requirements** are the tools or means required to achieve the safety targets.

Safety indicators and safety targets may be different (for example, the safety indicator is that 100% of staff are trained in the SMS in the first phase of the implementation of the SMS, and the safety target is a 30% increase in the safety culture of staff), or they may be the same (for example, the safety indicator is that 100% of staff are trained in the SMS in the first phase of the implementation of

the SMS and the safety target is that there is a 0% acceptance of having an employee not trained in the SMS). Safety indicators and safety target are reviewed annually during the Management Review described further.

3.2 Change Management

Hazards may inadvertently be introduced in an operation when there is change. Effective safety management requires that hazards be systematically and proactively identified and that risk management strategies be developed, implemented and subsequently evaluated. The objective is to reduce the safety risks resulting from changes to the provision, management or administration, of the airport services and products to ALARP. Change management is applied to a wide scope of activities; it is not limited to changes to services and systems but also extends to programmes and products. As well, it includes not only technical changes but also management and administration changes such as organisation structure, policies and procedures. Change management should be applied whenever:

- A major organisational change is being planned;
- The Organisation is undergoing rapid expansion or contraction;
- Introduction of new equipment or facilities is being considered;
- Existing equipment is being decommissioned;
- Introduction of new procedures is being planned;
- Existing procedures are being revised;
- Changes to key personnel are taking place; and
- There are changes to the legislation that the organisation operates under.

There are three key requirements of the change management process. The first is to develop a Safety Management Plan (SMP), whose purpose is to:

- Identify the requirement for safety management activities upon the type of change and complexity (gap analysis);
- Describe the activities necessary to fulfil those safety management requirements;
- Schedule those safety management activities;
- Identify roles and responsibilities; and
- Allocate resources for the activities.

A key activity of the SMS Manager is the conduct of the risk analysis management process, in particular, how many Hazards Identification and Risk Analyses (HIRAs) will be required, which HIRA process will be required, which HIRA process(es) will be used, who is responsible for the HIRA, which stake holders will participate and when will the HIRA be conducted.

The second requirement is to apply a risk management process, incorporating the appropriate system safety and human factors concepts and principles, which include the following key activities:

- Hazard Identification – The system under study is systematically reviewed to identify the types

of hazards present and/or those that may be introduced into the system by the proposed changes.

- Risk Assessment/Analyses – Once the hazards have been identified, the associated risks must be described and evaluated, in light of any existing and proposed mitigation, in order to determine whether it has been reduced to ALARP.
- Risk Mitigation/Control – If risks are not at a level that is as low as reasonably practicable, then further mitigation is required and risk control options are designed to mitigate the risk by either eliminating the hazard if possible, or reducing the frequency of the loss and/or consequences of the loss should it occur.
- Risk Monitoring/Evaluation – Risk monitoring is important given the assumptions made in relation to mitigation and the continuously changing aviation environment. Risk monitoring has four primary functions:
    - To detect and adapt to changing circumstances/SMS remains effective and relevant;
    - To ensure that risk control and mitigation options are achieving the expected results;
    - To verify correctness of assumptions (are we doing what we said?); and
    - To ensure proper implementation of risk control and communications strategies.

The third and final requirement of the change management process is the preparation of an annual Management Review Report (MRR).

3.2.1 Management Review Report

The [Airport Name] will perform an annual review of its SMS to evaluate its effectiveness. The review is coordinated by the SMS Manager. In this management review safety objectives and performance measures are evaluated, among other things.

If the Safety Management Plan describes what safety management activities are planned, the MMR describes the safety management activities that were undertaken along with the results of those activities. In general, the MMR will document the following:

- Both the current baseline and the change in sufficient detail to allow as understanding of the safety issues including the known functional/performance characteristics of the system, equipment or facility;
- The impact of the change on operations;
- The operational risk management methodology(ies) used to identify the hazards and assess the risks;
- The risk control strategies identified, together with evidence that the mitigations are accurate and complete based on the thoroughness of the hazard analysis and risk assessment; and
- Conclusions, including any assumptions, limitations and a statement that safety risks have been reduced to ALARP.

Consultation should be sought with the SMS Manager on when to apply the change management

process. By undertaking these activities, the Airport Authority will be proactively identifying the hazards and managing the risks before the changes are implemented. Not only does this make sense from a safety perspective; it is also a much more cost-effective to not have to go back to the drawing board and address safety issues that were missed.

The diagram on the following page illustrates how all the elements of a SMS work together to create an ever-changing and always improving dynamic safety culture capable of maintaining safety while accepting change.

Figure 1. Dynamic Safety Culture

The management review protocol is found in **Appendix D** of this report.

3.3 Continuous Improvement of the SMS

The best way to ensure correct operation of the organisations SMS programme is the audit process. Audits focus on the integrity of the organisation's SMS, and periodically assess the status of safety risk controls. Audits are not intended to be in-depth audits of the technical processes but rather they are intended to provide assurance to managers that activities within their areas of responsibility are being conducted safely and conform to the safety management system requirements. It will also demonstrate to all employees that the management is taking a continuing interest in safety. Employees should not see auditing as a threat but rather as a co-operative activity to improve the level of service.

There are two general types of audits that we will be subject to on a regular basis:

1. Internal audits – to confirm conformance with the safety management system (the Management Review is seen as a part of the Internal audit process); and
2. External audits – to confirm conformance with the regulatory requirements.

Section 21.490 of Schedule 21 of the BASR state that the Aerodrome Manual shall be:

- A reference document providing a checklist of aerodrome certification standards that must be maintained and the level of airside services at the aerodrome. Information provided in the Aerodrome Manual will enable the Authority to assess the suitability of the aerodrome for the aircraft operations proposed and to judge an applicant's fitness to safely operate the aerodrome;
- A basic reference guide for conducting site inspections for granting an aerodrome certificate and for subsequent safety inspections as it is a reference document agreed between the aerodrome operator and the Authority with respect to the standards, conditions and the level of service to be maintained at the aerodrome.

As such, the Aerodrome Manual is expected to form the basis of the audit checklists as they relate to the quality assurance process for ensuring technical compliance standards linked to the safe operation of the aerodrome based on ICAO's Annex 14 Volume 1.

The SMS Manager will arrange for an annual internal audit of the Safety Management System, including airport facilities and equipment. Additionally, the SMS Manager will arrange for an external audit and inspection for the evaluation of contractors, sub-contractors or tenants of the airport to comply with the Aerodrome Manual standards.

All audits conducted, whether internal or external shall be conducted by a suitably qualified safety expert(s) who shall prepare and sign the report. Credentials shall be provided in advance to the [Airport Name] Manager and may be forwarded for review to the BCAD.

3.3.1 Safety Oversight of Third Party Contractors

Based on the need for auditing these entities [Airport Name] should ensure that all contracts agreed with third party contractors will ensure compliance with BCAD regulatory requirements. Related training and direct oversight of third party contractors will be provided by the [Airport Name] based on requirements identified in each respective work plan.

3.3.2 The Audit Process

The requirements for aerodrome internal safety audits are intended to form part of the Aerodrome Manual and are detailed in Section 21.523 (Aerodrome Operator's Internal Safety Audits and Reporting) of Schedule 21 of the BASR. This section requires that:

- The aerodrome operator shall arrange for audits of the SMS, including inspections of the aerodrome facilities and equipment, and such audit:
    - Shall cover the aerodrome operator's own functions; and
    - Include an external audit and inspection programme for evaluation of other users, including fixed-base operators and organisations working at the aerodrome.
- The audits referred to above shall be carried out over 12 months, or less, as agreed with the Authority.
- The aerodrome operator shall ensure that the audit reports, including the report on the aerodrome facilities, services and equipment, are prepared by suitably qualified safety personnel.

- The aerodrome operator shall retain a copy of the report(s) referred to above for a period of 24 months and the Authority may request a copy of the report(s) for its review and reference.
- The report(s) referred to above shall be prepared and signed by the persons who carried out the audits and inspections.
- The aerodrome operator shall ensure that deficiencies identified during audits are corrected in a timely manner as agreed upon with the auditors.

The Airport Manager should base the audit checklists on the details of the Aerodrome Certificate and related reference provided in Schedule 21 of the BASR, specifically Appendix 4 to 21.497: Particulars of the Aerodrome Operating Procedures and Safety Measures.

A formal notification of intention to perform the audit is forwarded to the section to be audited in adequate time for any necessary preparations to be made. The section may be requested to provide preparatory material in advance of the actual audit, for example- training records. At the opening meeting, the person conducting the audit should briefly present the background for the audit, its purpose, and any specific issues to be addressed by the audit.

The techniques for gathering the information on which the audit team's assessment will be made include:

- ✈ Review of records;
- ✈ Interviews with staff; and
- ✈ Observations by the audit team.

The auditor would work systematically through the items on the relevant checklist. Once the audit activities are completed, the audit or would review all observations and compare them against the relevant regulations and procedures. An assessment would be made of the seriousness of all discrepancies. The audit would not focus only on negative findings. An important objective of the safety audit is also to highlight good practices.

A closing meeting would be held with the management of the section to brief them on the audit observations and any resulting recommendations. At this time a representative of the section would be given a chance to correct any misunderstandings. Dates for issuing an interim audit report and for receiving comments on it would be mutually agreed upon. A draft copy of the final report should be left with management.

At the completion of an audit, planned remedial actions would be documented for all identified areas of concern. It is the responsibility of the management of the section being audited to develop a corrective action plan setting out the actions to be taken to resolve identified deficiencies or safety shortcomings within an agreed time period. When completed, the corrective action plan should be forwarded to the SMS Manager. The final audit report will include this corrective action plan and detail any follow-up audit action proposed. The manager of the area being audited is responsible for ensuring the timely implementation of the appropriate corrective actions.

The audit report would be an objective presentation of the results of the safety audit. As soon as possible after completion of the audit, an interim audit report would be forwarded to the manager of the unit or section for review and comments. Any comments received would be taken into consideration in the preparation of the final report, which constitutes the official report of the audit.

An audit follow-up involves management of change. Upon receipt of the final audit report, management needs to ensure that progress is made to reduce or eliminate the attendant risks. The primary purpose of an audit follow-up is to verify the effective implementation of the corrective action plan. Follow-up is also required to ensure that any action taken pursuant to the audit does not in any way degrade safety. In other words, new hazards with potentially higher risks must not be allowed to enter the system as a consequence of the audit. Where a follow-up visit has been made, a further report of this visit will be prepared. This report will clearly indicate the current status of the implementation of the agreed corrective actions. If any non-compliance, deficiency or safety shortcoming remains unresolved, the auditor will highlight this in the follow-up report.

SECTION 4 - SAFETY PROMOTION

Training requirements for Aerodrome Certificate holders is generally described in Schedule 21 of the BASR. Section 21.145 (Competence of Operational and Maintenance Personnel), and requires that the aerodrome operator shall employ an adequate number of qualified and skilled personnel to perform all critical activities for aerodrome operation and maintenance. It further requires that the aerodrome operator shall employ as qualified and skilled personnel only those persons possessing the competency certification required by the Authority for such personnel. As such, there is an expectation for the aerodrome operator to establish a training and qualification programme for other safety related staff that do not require a certificate or license.

4.1 Safety Training and Education

An organisation's safety culture is linked to the success of its safety management training programme. All personnel must understand the organisation's safety philosophy, policies, procedures and practices, and they should understand their roles and responsibilities within that safety management framework. Safety training should begin with the initial familiarization of employees and continue throughout their employment. Specific safety management training should be provided for staff members who occupy positions with particular safety responsibilities. The training programme should ensure that the safety policy and objectives of the organisation are understood and adhered to by all staff, and that all staff is aware of the safety responsibilities of their positions.

4.1.1 SMS Training

During the initial implementation of the SMS, specific training will be provided for existing staff. Once the SMS is fully implemented, the safety training needs of those other than the safety specialists should be met by incorporating the appropriate safety content into the general training programme for their positions.

The SMS Manager shall ensure that each staff comprehends the SMS manual within a period of one month from the date of reporting for duty. For this purpose a copy of the SMS Manual shall be made available. A certificate from the staff member shall be obtained stating clearly that he/she has read and understood all the provisions of the SMS Manual.

4.1.2 Wildlife Management Training

Section 21.583 (b)(1) of Schedule 21 of the BASR requires that the operator of an airport shall provide

relevant training at least once every five years for each person who has assigned duties in respect of the airport wildlife management plan.

4.1.3 Training Records

Competency training requirements for each area of work will be documented and training files maintained for each employee, including management, to assist in identifying and tracking employee training requirements. Documented competency training policies for each individual functional area can be found in respective schedule of the BASR. Training records of each individual's courses must be kept for a period of five years in their training file.

4.2 Safety Communications

Safety communication is an essential foundation for the development and maintenance of an adequate safety culture. There are three basic elements used in safety communication:

- Safety communication;
- Consultation; and
- Reporting

The communication element captures the processes used to ensure the open exchange of safety-related information both externally and internally to the company. This element plays a critical role in ensuring that all the risks present in the air navigation system are recognized, registered and mitigated and the information gained, plus improvement measures, are disseminated across the whole company.

Consultation with all sections of [Airport Name] and its customers and suppliers on all aspects of safety is an important aspect of safety management as it formalizes links of communication among the respective stakeholders of aviation safety,

Reporting the results of safety investigations, safety reviews, safety audits and overall safety activities and performance to the appropriate audience has many benefits. It promotes transparency, commitment, ownership of safety issues. The most benefit of reporting safety issues and information is that it allows similar problems to be reported but most of all it allows for potential problems or issues to be eliminated before they happen. Prevention is always best.

The [Airport Name] is committed to ensuring that all personnel working airside are informed about the safety policies and objectives, how well the airport is meeting safety objectives, results of accident and incident investigations, new safety practices, and other matters dealing with safety. Some of the methods used are discussed further.

4.2.1 Safety Meetings

At least once per year, the SMS will hold safety meetings with airport staff and other personnel working at the airport. The purpose of these meetings is to:

- Report on safety performance as detailed in section;
- Summarize the initiatives and action taken, or planned, to address safety concerns and potential hazards;
- Report on lessons learned and action taken as a result of any incidents and accidents; and

- Discuss in an open forum the safety concerns that any of the participants might have.

Other communication methods include the following:

- Bulletin board;
- [Airport Name] Safety Newsletter;
- [Airport Name] website;
- Emails to staff; and
- Informal workplace meetings between staff and the SMS Manager.

Tier 1/Tier 2 Airport SMS Manual

APPENDIX A

SAFETY REPORT

AIRPORT SAFETY (SMS) REPORT

Date:	Time:	Log No.:
Reported by (*optional*): Name: Signature:	Tel : Department/Company:	

PART A: TO BE COMPLETED BY THE PERSON REPORTING THE HAZARD/INCIDENT/ACCIDENT

PART A
HAZARD/INCIDENT/ACCIDENT: Air operations/Runway ☐ Ground Operations /Apron ☐ Other ☐

1. I consider that the hazard / my report is:
   Critical/urgent ☐ Important ☐ Of a general nature ☐

2. In my opinion, I think that the potential that this hazard/Incident/Accident may be repeated is:

   Not likely 1 2 3 4 5 Very likely

3. **Description** (include weather conditions, nature of the threat, location on the airport, and the potential result/consequence or effect. You can also add diagrams, reports, or pictures):

Please send this report to the Airport Manager

This form should be used to report any airport hazard that has caused or could cause an accident or incident. This form is also used to report actual incidents and accidents. Send to the SMS Manager as soon as possible after the hazard is identified. You can submit the form anonymously by omitting relevant details.

SMS Manager to complete the following sections including risk assessment (PART B) on further pages as appropriate

Date this report was received: _____ **Safety Log #:** _____

Level of risk assessed as (Check the box and attach risk assessment as necessary):

E	Extreme risk, immediate action required	
H	High risk, senior management attention needed	
M	Moderate risk, management responsibility must be specified	
L	Low risk; manage by routine procedures	

Referred to BCAD: Y / N

Action(s) required (attach additional pages if there is insufficient room):

_____
_____
_____
_____
_____
_____

Person(s) responsible for implementing mitigation/corrective action:

_____
_____

Completion date(s) due: _____

Person making the report (if known) advised of outcome: Y / N **Date**: _____

Airport Risk Register updated: Y / N **Date**: _____

Signed: _____

Name: _____ (Airport Manager) **Date**: _____

Note: Follow-up to verify effectiveness of the mitigation must be done within one month of the event and checked off here during the Management review:

Initial and Date. Add note as appropriate

PART B: TO BE COMPLETED BY THE SMS MANAGER

1. Immediate causes (see checklist forms):

2. Root causes (see checklist form):

3. Recommendation(s) to eliminate or control the risk and prevent a recurrence:

3a. Immediate:

3b. Long-term:

4. Communicating feedback (to whom, how, when)

Signature: **Date:**

Identification of the immediate causes – [Airport Name]

Failure to use protective measures

- ☐ improper use of appropriate safety equipment
- ☐ failure to advise
- ☐ protection or warning systems disabled
- ☐ maintenance or operation of non-insulated or powered on equipment
- ☐ failure to use safety equipment
- ☐ failure to secure the equipment

Failure to observe accepted guidelines

General:

- ☐ failure to comply with proper start-up/commissioning procedures
- ☐ failure to comply with personal safety guidelines or standards
- ☐ failure to comply with proper operating procedures or methods
- ☐ failure to comply with proper maintenance procedures or methods

Details:

- ☐ operation of unauthorized equipment
- ☐ wrong position or posture
- ☐ incorrect placement
- ☐ effort exceeding physical capacity
- ☐ dangerous mixture of chemicals
- ☐ improper loading
- ☐ work performed at wrong speed
- ☐ risk taken consciously (by group)
- ☐ risk taken consciously (by individual)
- ☐ bickering

Misuse of tools or equipment

- ☐ incorrect use of equipment
- ☐ incorrect use of tools
- ☐ use of defective equipment (consciously)
- ☐ use of defective tools (consciously)

Inattention / Lack of a sense of the risk

- ☐ incorrect decision or lack of judgment
- ☐ distracted
- ☐ lack of attention to the surface or environment

Other blameworthy acts ☐ Specify _____

Blameworthy conditions

Faulty materials

	Specify		*Specify*
☐ defective equipment		☐ ill-prepared tools	
☐ defective tools		☐ ill-prepared equipment	
☐ non-compliant equipment		☐ non-compliant tools	

Reason:

☐ wear ☐ corrosion ☐ other (specify)

Controls or protection do not meet needs

	Specify		*Specify*
☐ non-compliant protection devices		☐ faulty protection devices	
☐ personal protective equipment non-compliant		☐ faulty warning systems	
☐ non-compliant warning systems		☐ faulty personal protective equipment	
☐ isolation of the procedure or equipment non compliant			

Risks related to airport operations

- ☐ risk of fire and explosion
- ☐ exposure to noise
- ☐ open systems
- ☐ exposure to radiation
- ☐ exposure to extreme temperatures
- ☐ exposure to chemicals dangerous
- ☐ electric system powered on

Risks in the workplace

- ☐ work at height
- ☐ non-compliant layout and clearance, congestion or projections
- ☐ insufficient lighting
- ☐ improper maintenance
- ☐ insufficient ventilation

Identification of the root causes – wWork -related factors – [Airport Name] Airport

Non-compliant design / engineering

May apply to facilities, equipment, tools, etc.

- ☐ not applicable
- ☐ poor technical design
- ☐ poor economic design
- ☐ improper evaluation - potential loss
- ☐ standards, specifications or design criteria non compliant
- ☐ insufficient follow-up of the activity
- ☐ improper evaluation of operating preparedness
- ☐ insufficient monitoring of operation at outset
- ☐ improper evaluation of changes and/or poorly documented changes
- ☐ other (specify)

_____

_____

Non-compliant maintenance procedures

Include conditions that may affect the maintenance system

- ☐ not applicable
- ☐ inadequate preventive maintenance
- ☐ inadequate corrective maintenance
- ☐ excessive wear
- ☐ life unduly prolonged
- ☐ insufficient inspection/follow-up
- ☐ inadequate evaluation of needs
- ☐ other (specify)

_____

_____

Incompatible objectives

Choose where the conflicting objectives come from different management systems. A change in these conditions normally has an impact on the management philosophy:

- ☐ not applicable
- ☐ system objectives VS safety objectives (i.e., costs, savings vs. personal safety)
- ☐ personnel objectives vs. safety objectives (i.e., perception of a inappropriate rewards system).
- ☐ system VS system objectives (i.e., reduce costs by reducing manpower)
- ☐ other (specify)

_____

_____

Conditions conducive to errors

Conditions in the work environment conducive to causing errors or infractions

- ☐ not applicable
- ☐ environmental stress:
  - ☐ noise
  - ☐ atmospheric conditions
  - ☐ lack of oxygen
  - ☐ exposure to health hazards
  - ☐ other (specify)

_____

_____

- ☐ work-related stress
  - ☐ monotonous or repetitive tasks
  - ☐ confusing requests
  - ☐ demands extreme concentration or perception
  - ☐ extreme physical or physiological effort required
  - ☐ fatigue due to the workload or the hours of mental work
  - ☐ fatigue due to sensory overload
  - ☐ other (specify)

_____

Non-compliant work procedures

Factors affecting the organization of workload:

- ☐ not applicable
- ☐ absence or inadequacy of safety meetings and/or procedures
- ☐ insufficient reference documents, directives or manuals
- ☐ lack of direction at the outset
- ☐ non-compliant labour standards
- ☐ lack or inadequacy of workplace safety analysis for to hazardous activities
- ☐ shift change procedures non compliant
- ☐ inadequate identification and evaluation of potential loss
- ☐ negative declaration (i.e., without a declaration, we assume that everything is fine).
- ☐ faulty application of the rules regarding personal protective equipment
- ☐ other (specify)

_____

Poor training

This section focuses on the training provided by the company:

- ☐ not applicable
- ☐ company training non-compliant
- ☐ lack of training by the company
- ☐ training requirements not identified in the job description
- ☐ training deemed ineffective (boring, lacking an incentive to learn)
- ☐ the requirements of the job do not match the training
- ☐ knowledge verification systems are insufficient or missing
- ☐ other (specify)

_____

_____

...continued

Identification of the root causes – Human factors – [Airport Name]

Communication failures

Includes the communication tools and communications processes:

- ☐ not applicable
- ☐ incomplete or unclear instructions
- ☐ poor communication of data, regulations and occupational health and safety guidelines
- ☐ insufficient communication tools
- ☐ insufficient horizontal communication (i.e., within the group)
- ☐ insufficient vertical communication (i.e., between the supervisor and the employee)
- ☐ insufficient communication between organizations
- ☐ absence of terminology standards and phraseology or misuse thereof
- ☐ other (specify)

_____

Organisational failures

Focuses on systems or programs within the organization:

- ☐ not applicable
- ☐ insufficient planning
- ☐ lack of clarity or inconsistencies in the hierarchical relationships
- ☐ lack of clarity or inconsistencies in the assignment of responsibility
- ☐ incorrect or insufficient delegation of authority
- ☐ audit/inspection programme insufficient
- ☐ accident and investigation reporting system insufficient
- ☐ insufficient purchases
- ☐ bad assignment (wrong person assigned to the task)
- ☐ lack of performance measurements and evaluation and feedback
- ☐ lack of knowledge of the managers' role
- ☐ absence or inadequacy of safety meetings
- ☐ insufficient promotion of security (visibility, acceptance)
- ☐ insufficient control of change system

other (specify)

_____

_____

Physical capacity

- ☐ not applicable
- ☐ sensitivity to substances or allergies
- ☐ visual impairment
- ☐ hearing impairment
- ☐ other sensory impairment
- ☐ respiratory difficulties
- ☐ other permanent physical disability
- ☐ temporary disabilities
- ☐ limited capacity to maintain body position
- ☐ limited body movement
- ☐ other (specify)

_____

_____

Mental capacity

- ☐ not applicable
- ☐ fears and phobias
- ☐ emotional disorders
- ☐ mental illness
- ☐ difficulty understanding
- ☐ learning disability
- ☐ poor judgment
- ☐ faulty memory
- ☐ poor coordination or unacceptable reaction time
- ☐ other (specify)

_____

_____

Physical stress

The physical circumstances of the individual that can lead him/her to make mistakes or make him/her more vulnerable to injury or disease:

- ☐ not applicable
- ☐ injury or illness
- ☐ fatigue due to lack of rest
- ☐ hypoglycemia
- ☐ under effect of alcohol or drugs
- ☐ other (specify)

_____

_____

Mental stress

The mental circumstances of the individual that can lead him/her to make mistakes or make him/her more vulnerable to injury or disease:

- ☐ not applicable
- ☐ frustration
- ☐ conflicting demands
- ☐ issues of concern
- ☐ unclear instructions
- ☐ 'absurd' or 'degrading' activities.
- ☐ other (specify)

_____

_____

Undue risk taken

Choose when conditions are specific to the individual or affect him/her directly.

The recommendations are generally the responsibility of the supervisor and the employee:

- ☐ not applicable
- ☐ rewarded for incorrect performance
- ☐ punished for good performance
- ☐ lack of incentives
- ☐ bad example from supervisors
- ☐ insufficient identification of critical safe behaviour
- ☐ insufficient reward for critical safe behavior
- ☐ inappropriate aggression
- ☐ other (specify)

_____

_____

Lack of knowledge or skills.

Conditions normally specific to an individual but that may be present within a group:

- ☐ not applicable
- ☐ lack of experience
- ☐ insufficient starting guidelines
- ☐ work rarely done
- ☐ lack of supervision
- ☐ lack of practice
- ☐ instructions misunderstood
- ☐ other (specify)

_____

_____

Tier 1/Tier 2 Airport SMS Manual

APPENDIX B

SAFETY REPORT/INCIDENT LOG

SAFETY REPORT/INCIDENT LOG

Safety Report Log No.	Activity	Hazards associated with this activity	Probability	Consequence	Initial Level of risk	Date of Report	Initials

Tier 1/Tier 2 Airport SMS Manual

APPENDIX C

RISK REGISTER

RA FORM 1: Risk Assessment – [Airport Name]						
Risk Ref No.	Activity	Hazards associated with this activity	Impacts if the event occurs	Probability	Consequence	Level of risk

RA FORM 2: Evaluation of mitigation measure effectiveness – [Airport Name]									
Risk Ref No. (RA FORM 1)	Mitigation measures Implemented					Probability	Consequence	Level of residual risk	Risk manager initials
	Elimination (date)	Substitution (date)	Separation (date)	Behaviour (date)	Administrative (date)				

Notes:

1. *You must assess the risk that results from each of the hazards that you have identified and add the risk rating in the column on RA FORM 1.*
2. *You must assess the residual risk after taking the risk treatments and controls into consideration and add the residual risk rating in the column of RA FORM 2. If the risk rating is above acceptable levels, you must introduce additional treatments and controls.*
3. *This Risk Register must be reviewed periodically by the SMS Manager. Any additional hazards that are identified must be added to the register and their risk assessed.*

Tier 1/Tier 2 Airport SMS Manual

APPENDIX D

MANAGEMENT REVIEW GUIDANCE

D.1 Management Review Guidance

The management review shall be scheduled at least one month in advance by the SMS Manager. The Accountable Executive (AE) shall have the ultimate responsibility to ensure its execution. The review should last only a single day during which the following (at a minimum) will be reviewed:

- A review of the safety policy to ensure its relevance;
- The results of the internal audit (quality assurance processes) as appropriate;
- The results of the safety culture survey;
- Employee interviews to ensure they are aware of their roles and responsibilities and to confirm the most effective communication and the effectiveness of training received;
- Progress in achieving safety objectives and goals;
- A review of safety reports (analysis of incidents/accidents and corrective action plans);
- A review of the follow-up from the last management review;
- A review of records and documents (maintenance, safety, retention period, etc.);
- All organisational or technical changes that may have an impact on airport operations;
- A review of the regulatory requirements (changes in applicable Regulations and Standards);
- A review of risk assessment reports; and
- Identification of practices to continuously improve operations.

The AE, in cooperation with the SMS Manager, has the discretion to consider additional material to add to the review protocol as appropriate.

The expected results of the management review include:

- The achievement of airport safety objectives; and
- A report with recommendations for follow-up. All follow-up action resulting from the management review will be submitted to the AE to ensure they are done according to a schedule defined in the report.

ANNUAL MANAGEMENT REVIEW REPORT

Review date:

Report for calendar year:

Follow-up measures from last management review

DESCRIPTION OF THE MEASURE	REPORT
Description of the necessary follow-up measure	Status (completed, overdue, in progress, etc.)

Safety Objectives Results

OBJECTIVE	PERFORMANCE/STATUS
Safety objective	Results

Results of the internal audit (Quality Assurance)

- Summary of last audit (key points only) and follow-up.

Communications

- Summary of the main activities for communicating the SMS, roles and responsibilities, training, specific initiatives (internal and external).

Summary of follow-up measures

- List of measures completed and their effectiveness, % completed, etc.

Identification of hazards

Using a proactive identification process, identify:

- Lessons learned in the previous year;
- New initiatives;
- Changes that should be considered;
- Best practices that should be considered; and/or
- New performance measures that should be adopted

N.B. These last points are used to generate team discussion.

THE MANAGEMENT REVIEW CHECKLIST PROTOCOL:

ITEM TO BE VERIFIED	OBSERVATIONS/COMMENTS	VERIFIED BY
Review of the safety policy		
Safety culture survey results		
Employee interviews to ensure they are knowledgeable about their roles and responsibilities		
Employee interviews to determine the most effective means of communication and the effectiveness of training		
Review of management of files (record keeping)		
Review of the regulatory		
Review of safety reports		
Review of the risk profile		
Other:		

The following manuals and plans were reviewed and updated:

Manual Analysed	Date	Comments
Operating manual		
Emergency plan		
Wildlife management plan		
SMS Manual		
Other		

Verified by: _____

Appendix B – Generic Safety Management System Manual: Tier 3 Airports

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[Airport Name]
Safety Management System
Manual

Bahamas Family Islands Airports

Tier 3 Airport

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FOREWORD

Safety has always been the overriding consideration in all aviation activities. This is reflected in the aims and objectives of ICAO as stated in Article 44 of the Convention on International Civil Aviation (DOC 7300), commonly known as the Chicago Convention, which charges ICAO with ensuring the safe and orderly growth of international civil aviation throughout the world.

In 2000, the International Civil Aviation Organization (ICAO) Air Navigation Commission commenced the process to amend Annex 14, Volume I, Aerodrome Design and Operations. New aerodrome licensing and certification requirements called for the development and implementation of a safety management system (SMS). As of 24 November 2005, an ICAO certified Aerodrome shall have in operation a safety management system (SMS). As of 14 November 2013, ICAO has implemented the first edition of Annex 19. This new Annex is a combination of existing overarching safety management provisions that highlights the importance of safety management at the State level and enhances safety by consolidating safety management provisions applicable to multiple aviation domains into a single Annex as opposed to the current six Annexes. Annex 19 facilitates the future evolution of safety management provisions, it promotes aligned implementation of the SMS and a State Safety Programme (SSP), and it creates a process to collect and analyse feedback regarding the implementation of the SMS and SSP. *Note that ICAO refers to airports as "aerodromes", and uses "States" to refer to ICAO signatory countries, which includes the Bahamas.*

In accordance with ICAO guidance, a SMS shall document and comply with processes to:

- Identify safety hazards;
- Ensure that remedial actions necessary to mitigate the risks/hazards are implemented; and
- Provide for continuous monitoring and regular assessment of the safety level achieved.

An organisation's SMS shall also clearly define lines of safety accountability, including a direct accountability for safety on the part of senior management (Accountable Executive) with control over the necessary resources (financial and human) to ensure the continuous effective operation and improvement of the SMS.

The BDCA, through the promulgation of its State Safety Programme (SSP) requires that all airport operators implement a SMS. The airport's SMS shall be reviewed by the BCAD as a sub-set of the overall Aerodrome Manual as required under Section 21.520, and detailed in Section 21.587 and Appendix 5 to 21.497: Aerodrome Administration and Safety Management System, of Schedule 21 of the BASR.

Note: Although the provisions for an SMS detailed in Schedule 21 apply to "Certified" aerodromes, it is BCAD's intent to ensure the safe operation of its "Registered" aerodromes by adopting an SMS model that will be modified from the generic Tier 1 and Tier 2 SMS Manual, and that will allow an "equivalent level of safety" to be applied to Tier 3 aerodromes.

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III RECORD OF AMENDMENTS

NR/Year	Publication date	Date inserted	Inserted by

IV DEFINITIONS

Accident: "Accident" includes any fortuitous or unexpected event by which the safety of an aircraft or any person is threatened (from the Bahamas Civil Aviation Act).

Airside Personnel: Persons assigned duties on airside that are either employees of the airport operator or those persons employed by third-party airside operators, including fixed-base operators, ground handling agencies, airlines and other organisations that perform activities independently at the airport in relation to flight or aircraft handling.

BCAD: Bahamas Civil Aviation Department

Cost: Activities, both direct and indirect, involving any negative impact, including money, time, labour, disruption, goodwill, political and intangible losses.

Hazard: A source of potential harm or a situation with a potential to cause loss.

Incident: An occurrence, other than an accident, associated with airside operations which affects, or would affect, the safety of operation.

Likelihood: Used as a qualitative description of probability or frequency.

Monitor: To check, supervise, observe critically, or record the progress of an activity or system on a regular basis in order to identify change and track performance.

NOTAM: Notice to Airmen (NOTAM) is a notice filed with an aviation authority to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight. NOTAMs contain information concerning the establishment, conditions or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel and systems concerned with flight operations.

Probability: The likelihood of a specific outcome.

Quality assurance: All those planned and systematic actions necessary to provide adequate confidence that a system, component, or facility will perform satisfactorily in service.

Risk: The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood.

Risk analysis: A systematic use of available information to determine how often specified events may occur and the magnitude of their consequences.

Risk assessment: The overall process of risk analysis and risk evaluation.

Risk evaluation: The process used to determine risk management priorities by comparing the level of risk against predetermined standards, target risk levels or other criteria.

Risk identification: The process of determining what can happen, why and how.

Risk level: The level of risk calculated as a function of likelihood and consequence.

Risk management: The culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects.

Runway Incursion: Any occurrence at an airport involving an aircraft, vehicle, person or object on

the ground that creates a collision hazard or results in the loss of separation with an aircraft taking off, intending to take off, landing or intending to land (US FAA).

Safety: Safety is the state in which the risk to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management (ICAO, Schedule 21 of the BASR).

Safety Deficiency: An unsafe condition or underlying factor with risks for which the defences are less than adequate.

Serious Incident: An incident involving circumstances indicating that an accident nearly occurred.

Safety Management: A systematic approach to managing a safety system (SMS) including the necessary organisational structures, accountabilities, policies and procedures.

Safety Management System: A system for the management of safety at aerodromes, including the organisation structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for the control of safety at, and the safe use of, the aerodrome (Schedule 21, BASR).

Wildlife hazard. A potential for damage to aircraft through collision with birds or animals on or near an aerodrome.

V INTRODUCTION

GENERAL DESCRIPTION OF [Airport Name] OPERATIONS

[Airport Name] is a Tier 3 aerodrome which receives private aircraft for the transport of less than 20 passengers with approximately ### movements (take-offs or landings) annually. It is located XX minutes from [nearest town] and occupies an area of approximately XXX hectares. The aerodrome is not currently served by scheduled flights.

The airport has a single runway that is XXXX ft. by XXX ft. It is laid out [provide orientation]. The airport is equipped with lighting which serves the runway; although only for emergencies.

The airport currently has the vocation of a general aviation airport and its XXXXX annual movements are primarily due to smaller aircraft of all types. The airport regularly handles [aircraft type] aircraft.

SMS FRAMEWORK

As defined by ICAO, the four basic building blocks and twelve elements of the safety management system are:

1. Safety policy and objectives
    1.1. Management commitment and responsibility
    1.2. Safety accountabilities and responsibilities
    1.3. Appointment of key safety personnel
    1.4. Coordination of emergency response planning
    1.5. SMS process and documentation
2. Safety risk management
    2.1. Hazard identification
    2.2. Risk assessment and mitigation
3. Safety assurance
    3.1. Safety performance monitoring and measurement
    3.2. The management of change
    3.3. Continuous improvement of the SMS
4. Safety promotion
    4.1. Training and education
    4.2. Safety communication

This structure is in alignment with the details provided in Sections 21.520 and 21.587 of Schedule 21 of the BASR that form the target structure of the Bahamas Family Islands Airports SMS manuals.

APPLICATION OF MANUAL CONTENT

This Safety Management System was developed based on the requirements of ICAO Annex 19 as

specified in Schedule 21 of the BASR and is relevant to the operations of the BCAD Airports in the Bahamas Family Islands. Nothing contained in this manual is meant to supersede any standard, order, instruction or recommendation issued by the Director Civil Aviation. In the event any discrepancy is noticed in the material contained in this manual and that published by the regulators, the reader is advised to bring the same to the notice of the Airport Manager so that a suitable amendment can be issued.

A safety management system takes into account that there will always be hazards and risks. The implementation of this document will help [Airport Name] proactively manage and control the threats before they lead to mishaps. The implementation of a SMS represents a change in the safety culture of an organisation. This change will not occur overnight and will take the commitment of all concerned parties in order to be fully implemented. The management of the Bahamas Family Islands Airport Authority is committed to the further development of this SMS document which will direct the management of the SMS at [Airport Name].

TARGET AUDIENCE

Application of the material herein is not limited to the local aerodrome Operations Supervisor, but is also relevant to [Airport Name] users and emergency personnel and Island Administrator staff as appropriate.

USING THIS MANUAL

The purpose of this manual is to assist all those who work at, work with or visit [Airport Name] in fulfilling the requirements of ICAO Annexes 6, 11, 14, and 19 with respect to the implementation of a SMS. In particular, this material is aimed at personnel who are responsible for managing, implementing, and performing safety activities, namely:

- [Island Name] officials with responsibilities for compliance with BCAD regulations;
- [Airport Name] operational staff; and
- Managers and staff of organisations conducting operations with the potential to affect safety at the airport.

Users should find sufficient information herein for operation of an effective SMS.

SECTION 1 – SAFETY POLICY AND OBJECTIVES

Section 21.520 (Safety Management System) of Schedule 21 of the BASR requires that the Airport Manager (aerodrome operator is used interchangeably in the Regulation) establish a Safety Management System (SMS) for the aerodrome describing the structure of the organisation and the duties, powers and responsibilities of the officials in the organisational structure with a view to ensuring that operations are carried out in a demonstrably controlled way and are improved where necessary. It further specifies that all the users of the aerodrome, including fixed-base operators and those performing activities independently at the aerodrome in relation to flight or aircraft handling, to comply with the requirements of the aerodrome operator with regard to safety at the aerodrome and shall monitor such compliance. In the case of Tier 3 airports, the Island Administrator plays a central role in the proper management of the aerodrome. With the support of a designated local Aerodrome Operations Supervisor, and with central leadership and technical support from the Family Islands Airports Authority, the aerodrome's SMS strategy and planning shall include:

- Setting safety performance targets;
- Allocating priority for implementing safety initiatives;
- Providing a framework for controlling safety risks to a level as low as reasonably practicable having regard to the requirements of the Standards and Recommended Practices in ICAO Annex 14 Volume 1 and applicable regulations, standards, or other guidance material; and
- Methods for promulgating information and ensuring competence within the SMS.

Schedule 21 requires that all the users of the aerodrome, including fixed-base operators and organisations referred to above to cooperate in the program to promote safety, and the safe use of, the aerodrome by immediately informing it of the accidents, incidents, defects and faults which have a bearing on safety.

1.1 Management Commitment and Responsibility

While the elimination of all accidents and incidents is desirable, a one hundred percent safety rate is an unrealistic goal. Failures and errors will occur, in spite of best efforts to avoid them. No human activity or human- made system can be guaranteed to be absolutely safe, i.e., free from risk. Safety is a relevant notion whereby inherent risks are acceptable in a "safe" system.

Safety management is increasingly viewed as a management of risks. The primary purpose of the [Airport Name] Safety Management System Manual (SMS Manual) is to implement a system under the control of the Airport Authority SMS Manager to ensure compliance with relevant ICAO and BCAD requirements on safety management. In recognition of the importance that BCAD places on safe operations, the following policy and objectives for safety in all areas under its control is hereby released and will be immediately incorporated into all processes and functions at the airport.

SAFETY POLICY

Safety is one of our core business functions. We are committed to developing, implementing, and improving strategies and processes to ensure that all our aviation activities uphold the highest level of safety performance and meet applicable national and international standards. We will report incidents, train staff on safety management procedures, and strive to make continuous proactive improvement to the overall level of safety performance of the aerodrome. Everyone supporting the operations of the airport is accountable for the delivery of this highest level of safety performance, starting with the Accountable Executive, the General Manager Airport Authority.

Our commitment is to:

- **Support** the management of safety by creating an organisational culture that encourages safe practices, effective safety reporting and communication, and actively manages safety with the same attention to results that is used in managing all systems that can cause bodily harm or destruction to property.
- **Enforce** the management of safety as the primary responsibility of all employees.
- **Clearly define** for all staff their accountabilities and responsibilities under the safety management system (SMS).
- **Establish** and operate hazard identification and risk management programmes, including a hazard reporting system, in order to decrease or eliminate hazards resulting from our operations or activities.
- **Ensure** that no action will be taken against any employee who discloses a safety concern through the hazard reporting system unless such disclosure indicates, beyond any reasonable doubt, an illegal act, gross negligence, or a deliberate or wilful disregard of regulations or procedures.
- **Comply** with, and wherever possible exceed, applicable legislative and regulatory requirements and standards.
- **Ensure** training of personnel to a level of competency to be able to implement safety strategies and processes, and allocated only tasks commensurate with their skills.
- **Establish** and measure our safety performance against realistic safety performance indicators and safety performance targets.
- **Continually improve** our safety performance through management processes that ensure relevant safety action is taken and is effective.
- **Ensure** externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

_____

General Manager Airport Authority
Accountable Executive

[Airport Name] SAFETY OBJECTIVES:

Achievement of continuous improvement from the safety policy will require commitment to the following objectives:

- **Safety Management System**. Appoint a Manager for the Safety Management System to oversee the development and implementation of the programme and ensure that the application of the SMS is integral to all our aviation activities;
- **Safety Culture**. Develop and embed a safety culture in all our aviation activities that recognizes the importance and value of effective aviation safety management and acknowledges at all times that safety is paramount;
- **Safety Accountabilities**. Clearly define for all staff their accountabilities and responsibilities for the development and delivery of aviation safety strategy and performance. Ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters and are only allocated tasks commensurate with their skills;
- **Risk Management**. Minimize the risks associated with aircraft operations to a point that is As Low As Reasonably Practicable (ALARP) and establish and measure our safety performance against realistic objectives and/or targets;
- **Regulatory Compliance**. Actively develop and improve our safety processes to conform to applicable ICAO and BASR Schedules. Comply with and, wherever possible, exceed applicable legislative and regulatory requirements and standards. Ensure that externally supplied systems and services that impact upon the safety of our operations meet appropriate safety standards;
- **Human Resources**. Ensure that sufficient skilled and trained resources are available to implement this safety policy and continually improve our Safety Performance; and
- **Safety Oversight**. Conduct safety audits, including incident and accident investigations, and management reviews and ensure that relevant action is taken and documented.

1.2 Safety Accountabilities and Responsibilities of Managers

Responsibility and accountability are interlinked. While individual staff members are responsible for their actions, they are also accountable to their supervisor or manager for the safe performance of their functions. Although individuals must be accountable for their own actions, managers and supervisors are accountable for the overall performance of the group that reports to them. Managers are also accountable for ensuring that their subordinates have the resources, training, experience, etc. needed for the safe completion of their assigned duties.

Safety management is an integral part of all employees' day-to-day jobs. All team members are responsible for the smooth running of the Safety Management System (SMS) and for maintaining safety. The day-to-day management of safety at [Airport Name] will be accomplished by the local aerodrome Operations Supervisor. The overall management responsibility will be the responsibility of the Airport Authority SMS Manager. The four essential functions of safety management at Tier 3 airports are:

- Management and monitoring of the hazard identification system;
- Performance monitoring of the safety of airport operations;
- Communicating safety management needs to the Accountable Executive (AE); and
- Provide assistance to the members of the team in all aspects of safety management.

All personnel must report hazards and incidents, so that measures are taken to minimize or eliminate these hazards, learn from these events and avoid their recurrence. Ultimate responsibility for safety at [Airport Name] rests with the General Manager Airport Authority as the AE.

Figure 1 below shows the Organization of [Airport Name] Safety Management System (SMS) and its integration with the rest of the organisation. Roles and responsibilities under the SMS are described in detail further.

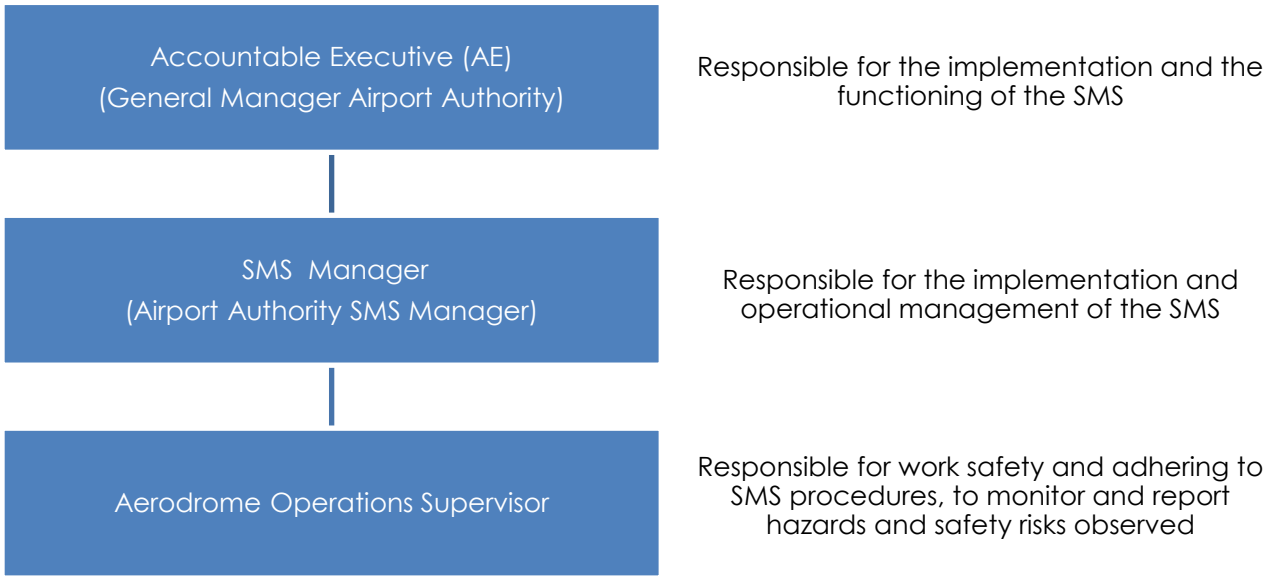


FIGURE 1 - Organisation of [Airport Name] and SMS key roles

1.2.1 Accountable Executive

The Accountable Executive (AE) is the General Manager Bahamas Family Islands Airports Authority (Airport Authority). The AE has the responsibility of ensuring the implementation and the efficient functioning of the SMS. This responsibility means, among other things, that the AE:

- Develops and actively promotes the safety policy;
- Approves the SMS manual;
- Establishes a system for safety management education and safety awareness;
- Establishes a safety audit and surveillance system and participates in the Management Review periodically;
- Acts as an effective interface with the BCAD regarding safety matters;
- Participates in safety relations with international bodies including ICAO;
- Provides the resources necessary for the implementation and management of the SMS;
- Implements the appropriate controls over financial activities to ensure the safety of all airports in the Bahamas Family Islands is not compromised by changes to the financial system;
- Provides the resources necessary to ensure that all employees receive training in SMS and they receive the training needed to perform their duties in a safe manner;
- Ensures the development of personnel policies, personnel management and placement of personnel most suited for the task and having the correct attitude towards operational safety;
- Demonstrates leadership by actively and visibly participating in strategic events related to the SMS;
- Actively promotes and encourages a positive culture of safety at [Airport Name];
- Contributes to the development of the strategic safety objectives and participates in their review;
- Ensures that critical safety issues are reported in a timely manner to the Director of Civil Aviation;
- Ensures the development of safety standards; and
- Ensures the continuous improvement of the SMS through the review of the annual management review.

1.2.2 Safety Management Systems Manager (SMS Manager)

The SMS Manager is the Airport Authority SMS Manager. The SMS Manager is responsible to the AE for the implementation and management of the SMS. The SMS Manager:

- Is responsible for implementing the SMS plan and maintaining the SMS;
- Assumes the leadership role to ensure commitment throughout [Airport name] to the safety management policy intent and safety management system requirements;

- Manages all safety requirements including procedures for identifying, reporting, tracking and correcting safety issues;
- Ensures that staff are trained, qualified and competent to discharge their safety related obligations;
- Promotes safety management training;
- Keeps the SMS Manual up to date;
- Advises the AE on safety matters;
- Ensures that safety issues are reported in a timely manner to the AE;
- Performs/facilitates hazard identification and safety risk analysis
- Manages the SMS reporting system;
- Coordinates investigations on the SMS reports as appropriate;
- Reviews investigation of accidents, and incidents to promulgate lessons learned;
- Ensures the implementation of corrective measures resulting from the analysis of SMS reports and evaluates their effectiveness;
- Ensures that staff are aware and held accountable for their safety performance; and
- Ensures resources are available for the proper maintenance of pavements (runways, taxiways, aprons, etc. as appropriate), airport facilities as appropriate and other airport services including landscaping and wildlife hazard mitigation.

1.2.3 Aerodrome Operations Supervisor

The Aerodrome Operations Supervisor is responsible for the day-to-day implementation of the requirements of the airport operations manual and associated safety requirements. The Aerodrome Operations Supervisor is responsible for:

- Understanding and facilitating the requirements to satisfy the Safety Policy and Objectives as well as the reporting of incidents, accidents, hazards, and dangers;
- Actively participating in SMS training;
- Working in collaboration with the Island Administrator and Island security personnel for the safe implementation of the AEP; and
- Keeping the SMS Manager informed of any changes or equipment restrictions that may have a negative impact on airport safety.

1.3 Appointment of Key safety personnel

Given the total costs of aviation accidents, many groups have a stake in improving the management of safety. The principal stakeholders in safety at [Airport Name] are listed below:

- Civil Aviation regulatory authority (Airport Authority);
- Island Administrator;
- Airport Authority SMS Manager;

- Aircraft owners and operators;
- International Civil Aviation Organization (ICAO);
- Island Security and Emergency personnel;
- Aerodrome Operations staff; and
- The flying public.

All personnel should display attitudes and behaviours which reflect the primacy of safety at [Airport Name] operations. Each person has a duty to identify and report factors or events which may impact safety of operations. Safety starts at the top. Therefore senior management at BCAD through all levels of management must lead by example and provide an ambience and forum for open and unencumbered communication of safety concerns by all staff. Non punitive reporting is a cornerstone of any safety management program. All levels of management must be open to employee safety concerns and promote and ensure that there is no punitive fallout for the reporting of safety concerns. All personnel with access to the aerodrome must feel free to report any safety concerns they have and have an expectation that they will be heard, that their concerns be taken seriously and that their career or employment will not be affected.

1.3.1 All Civil Aviation Personnel Responsibilities

All Civil Aviation employees are responsible for working safely and following SMS procedures. All employees are also responsible to look for and report safety risks and hazards as well as those procedures which could result in, or which have resulted in safety risks, even if they have been committed by themselves. Finally, employees shall participate in an open and constructive way, in all SMS activities that affect them, including for example SMS training, hazard assessments and reviews, investigations of root causes, the development of corrective measures and their application as needed.

All personnel working in support of the operations of [Airport Name], both regular and occasional employees shall apply the principles of the SMS on a daily basis. Their responsibilities include, but are not limited to the following:

- Actively participate during SMS training sessions;
- Identify hazards and assist in their analysis as needed;
- Participate, if necessary, in investigations of incidents and accidents related to safety;
- Assist in developing corrective measures;
- Apply corrective measures in place.
- Apply system safety measures as required by safety management procedures and instructions; and
- Advise the Airport Authority SMS Manager, or their supervisor, of any safety occurrence or system failure and to identify and report any situation of potential risk or concern affecting system safety via one of the following means:
    - Submitting either an Incident/Accident report or a Confidential Report.

- Supporting safety audits as and when they occur; and
- Supporting safety investigations as and when they occur.

1.4 SMS Implementation Plan

The SMS Implementation Plan for [Airport Name] will be phased-in over a three year period in accordance with the four-phase approach recommended by ICAO. The Implementation plan will be initially developed by the BCAD Airport Authority and implemented through the Airport Authority SMS Manager.

1.5 Coordination of the Aerodrome Emergency Plan

Emergency Planning will be performed in accordance with Bahamas Civil Aviation (Safety) Regulation Schedule 21 (Aerodrome Certification) Section 21.255 (Aerodrome Emergency Plan). The Aerodrome Emergency Plan (AEP) developed for the [Airport Name] is prepared under separate cover.

The AEP is designed to meet the standards of International Civil Aviation Organization (ICAO) Annex 14, Aerodromes, Volume I, Aerodrome Design and Operations Chapter 9.1 Aerodrome Emergency Planning as well follow guidance from Code of Federal Regulations (CFR) Part 139, Advisory Circular 150/5200-31C, Airport Emergency Plan, to minimize the possibility and extent of personal injury and property damage on the airport in an emergency. It establishes an Emergency Management Organization and assigns functions and tasks consistent with the Incident Command System (ICS) organisation structure. It provides the framework for coordination and full mobilization of Airport and external resources. It clarifies strategies to 1) prepare for, 2) respond to, and 3) recover from an emergency or disaster.

Key responsibilities for the coordination of the emergency plan are described in the AEP Manual. Depending on the emergency, the following individuals will have a role to play:

- Island Administrator or Representative;
- Island Fire Rescue personnel;
- Police;
- Airport Authority General Manager; and
- Aerodrome Operations Supervisor.

1.6 SMS Documentation

1.6.1 Data reporting

The primary objective of aviation safety at an airport is to avoid collisions and or strikes involving persons, aircraft or vehicles on the manoeuvring area that will result in death or injuries to persons. Success in meeting our goals and implementing our programs will be reported annually. To achieve our goals, the [Airport Name] will implement detailed safety policies and practices, training and safety communication programmes. Indicators of the implementation of safety programmes, practices and training will be reported annually. Key indicators include, for example:

- Number and percentage of personnel who received safety awareness training;

- Number and percentage of existing personnel who received refresher safety training;
- The number of formal concerns addressed and not addressed within one month;
- The number of incident and accident reports addressed and not addressed within one month;
- A listing of periodic safety bulletins that were issued;
- A summary of new or revised safety practices and procedures that were developed and issued;
- A summary of communications initiatives taken during the year;
- A summary of special safety training seminars such as manual lifting, use of new equipment, etc., that were held and who attended; and
- A summary of audit and monitoring reports and actions taken.

The Airport Authority SMS Manager is responsible for preparing an Annual Safety Report that will address the key indicators and how well the airport has met its safety objectives.

1.6.2 Document and Data Record Keeping

Table 1 presents a list of the documents and records that relate to the [Airport Name] SMS. In general, hazard and incident/accident reports and records (Safety reports) and any other report related to the SMS and from the various airport manuals (operations manual, wildlife management plan, and aerodrome emergency plan) are kept in the Island Administration office. Specific control lists, at the beginning of each document, facilitate their control. The SMS Manager ensures the effective control of records.

All original records are retained as stipulated in Table 1. Record keeping ensures that:

- The files are readable and clearly identify their origin;
- Files are stored to ensure their integrity;
- Records are retained in 'paper' or electronic format in a clearly identified central, SMS file; and
- Records are reviewed annually during the management review to ensure their maintenance, their quality, and their relevance.

Table 1. List of Safety-Related Documents and Records

Title	Found in:
Safety Report Form	SMS Manual, Appendix A
Completed Safety Reports	SMS Manager's office
Training calendar	SMS Manager's office
Training files	Personnel files
Wildlife Management Activities Register and annual report (Wildlife Management Plan)	SMS Manager's office
Report on the state of the runway and taxiways	SMS Manager's office
NOTAMs	SMS Manager's office

Schedule 21 of the BASR established record keeping for multiple documents/records that are required under the SMS. Although the minimum retention time for many of these records is 24 months, the following records will be kept for a period of 5 years:

- The original SMS documents and subsequent revisions;
- Risk assessments and associated action plans;
- Safety Hazard Reports;
- Safety Observations Report;
- Accident and Incident Analysis Forms;
- Annual Safety Reports;
- Airport Airside Safety Directives, Policies, Practices and Rule;
- Safety Bulletins;
- Description of Training Programs, who attended and when; and
- Operational and maintenance records.

All mandatory incident and accident reports will be kept for at least 5 years. If there is a legal action outstanding or anticipated regarding an incident or accident, then they will be kept until the legal action is completed.

1.6.3 SMS Reporting Systems

Safety management systems involve the reactive and proactive identification of safety hazards. Accident investigations reveal a great deal about safety hazards; but fortunately, aviation accidents are rare events. They are, however, generally investigated more thoroughly than incidents. Research leading to the 1:600 Rule showed that the number of incidents is significantly greater than the number of accidents for comparable types of occurrences. The causal and contributory factors associated with incidents may also culminate in accidents. Often, only good

fortune prevents an incident from becoming an accident. Unfortunately, these incidents are not always known to those responsible for reducing or eliminating the associated risks. This may be due to the unavailability of reporting systems, or personnel not being sufficiently motivated to report incidents.

1.6.3.1 Need for Safety Reports

Knowledge derived from incidents can provide significant insights into safety hazards. Safety reports systems should not just be restricted to incidents, but should include hazards, i.e. unsafe conditions that have not yet caused an incident. Data from such reports facilitates an understanding of the causes of hazards, helps to define intervention strategies and helps to verify the effectiveness of interventions. Depending on the depth to which they are investigated, incidents can provide a unique means of obtaining first-hand evidence on the factors associated with mishaps from the participants.

1.6.3.2 Statutory requirements

The Bahamas Civil Aviation State Safety Programme (SSP) and SMS requirements established by ICAO, and adopted under Schedule 21 of the BASR, require each airport to establish an incident reporting system to facilitate the collection of information on actual or potential safety deficiencies. In addition, personnel are encouraged to submit voluntary incident reports which:

- Facilitate collection of information that may not be captured by a mandatory incident reporting system;
- Is non-punitive; and
- Affords protection to the sources of the information.

Non punitive reporting is a cornerstone of any safety management programme. Management must be open to employee safety concerns and promote and ensure that there is no punitive fallout for the reporting of safety concerns. All employees must feel free to report any safety concerns they have and have an expectation that they will be heard, that their concern take seriously and that their career or employment will not be affected. As part of the education process, the SMS will ensure that staff is made aware that they will not be penalized for submitting a report and their confidentiality will be protected if require.

1.6.3.3. Mandatory incident reporting

At [Airport Name], it is mandatory to report any incident involving an unsafe, or potentially unsafe, occurrence or condition, irrespective of whether it involves injury or property damage or not. The report is to be submitted to the Airport Authority SMS Manager as soon as possible after the occurrence/ incident but in any case not later than 48 hours after the incident. The accident/incident reports may be submitted in the format placed in **Appendix A** to this manual, or in any other format the user finds more suitable. The person reporting, at his/her own discretion, may or may not disclose his/her identity. It is mandatory to report the following occurrences:

- Bird strike of an aircraft;
- Abnormal bird concentrations;

- Failure of Navigational/Landing Aids;
- Failure of Communication Services;
- Failure of airport lighting systems;
- Failure of any facility and procedure used in airside operations;
- Runway obstructed by foreign object;
- Presence of any wild animal in the operational area and likely to affect safe operations;
- Going round of an aircraft on final approach due to runway not being available;
- Major deterioration of services in airport manoeuvring area;
- Collision between moving aircraft and vehicles or any other ground equipment;
- Collision between vehicles or vehicles and ground support equipment (GSE);
- Fuel spillage;
- Apron jet blast/turbo prop blast incident;
- Breaches of airside driving rules resulting in hazards to aircraft;
- Failure to detect an unserviceable condition of airside facilities;
- Any incident of fire which either necessitates use of fire extinguishers or causes failure of any equipment or facility or disturbs smooth flow of air traffic or passengers or visitors; and
- Any incident that has jeopardized safety of passengers / public and was avoided.

1.6.3.4 Mandatory Reporting to SMS Manager/BCAD

In addition to the reporting mechanisms described previously, some incidents and accidents require mandatory reporting to the SMS Manager and the BCAD, for the purpose of complying with the BCAD SSP and Schedule 21 of the BASR. Mandatory reporting is required for:

- Any accident or event that results in a fatality, injury or illness to person or damage to property or the environment;
- An event which if not corrected would likely endanger people, property or the environment, or an incident involving circumstances indicating that an accident nearly occurred. The following are examples of these types of incidents:
    - Failure or significant malfunction of airfield lighting;
    - Runways or aircraft manoeuvring areas obstructed by aircraft, vehicles or foreign objects, resulting in a hazardous or potentially hazardous situation;
    - Runway incursions;
    - Errors or inadequacies in marking of obstructions or hazards on runway or aircraft manoeuvring areas;
    - Collision between a moving aircraft and any other aircraft, vehicle or other ground object;

- Jet or prop blast incidents that could have resulted in significant damage or serious injury;
- FOD and wildlife on the runway that strikes an aircraft; and
- When an aircraft was, or could have been, endangered by the impairment of any member of ground staff.

The SMS Manager is responsible for ensuring that a Mandatory Safety Report is prepared when required. In some cases, the private aircraft operators may actually prepare a report and submit to the Aerodrome Operations Supervisor for submission to the SMS Manager and the BCAD. In other cases, the SMS Manager will have to prepare the report with the input of those that witnessed or observed the incident or accident. In all cases the report will be submitted as soon as practicable and by the quickest means practicable. Notwithstanding the requirements to actually prepare and file a Mandatory Report, it is the responsibility of every person working at the airport who observes or witnesses a mandatory incident or accident to inform the SMS Manager, or their respective delegate of the details of the incident or accident immediately.

1.6.3.4 Voluntary Reporting

Any person working at the airport may and is encouraged to report what they see as a potential safety hazard or concern which could lead to an accident, damage or injury. Examples include: airside personnel potentially exposed to jet/prop blast, vehicles left unattended on the apron, confusing signs, poor lighting, etc. The person who wants to make a report may do so by verbally telling the Operations Supervisor or the SMS Manager about his or her concern. A verbal report can be made at any time. The person may also decide to prepare and submit a written report to the SMS Manager. The person making the report can further elect whether to provide his or her name on the written report. The SMS Manager will maintain the confidentiality of the person making a report. If a report is received verbally, the SMS Manager will note the verbal report on his Safety Observation Report described subsequently without indicating who provided the report unless that person provides his or her approval to do so. Further, depending on the severity of the hazard or concern, recommendations will be made or action taken to mitigate the hazard as quickly as possible. Once the SMS Manager receives a verbal or written report, the SMS Manager will investigate the potential hazard, analyse the potential risk, and determine what action, if any, is required. For written reports, the SMS Manager will provide feedback to the originator that the concern or potential hazard has been analysed and that appropriate action has been taken, or why no action was taken if appropriate. This information will be recorded in the follow-up section of the Safety Report.

1.6.3.5 Handling Safety Reports

The safety reports received will be handled with absolute confidentiality as far as the names and identities of those involved are concerned. The reports which are mandatory to be transmitted to the Airport Authority would be transmitted and followed up with a brief investigation report, where applicable.

In any case, each report would be investigated, analysed and entered in a log (**Appendix B**). The logs will be reviewed annually during the management review and analysed to see if any trends or re-occurring issues warrant the review of safety measures. This would then be documented and acted upon accordingly. In order to ensure build-up of user confidence in the SMS, it is important to

provide feedback to the reporting individual on what action, if any, was taken on the report. It is important to remember that this feedback is even more important when no action was taken since in the absence of any visible action, the users may lose confidence in the system and stop reporting matters altogether. In the event the report received was anonymous, this feedback may be communicated in general communications posted at the aerodrome, or circulated in the form of a notice board entry/e-mail containing a brief statement of the problem and action taken to resolve the same without referring to the fact that the same was consequential to an anonymous report.

1.6.4 Safety Violations

Although the [Airport Name] supports a "no-blame" accident and incident reporting policy, the [Airport Name] will not tolerate violations of certain safety rules at the airport. Personnel safety violations include, but are not necessarily, limited to the following:

- Failure to report damage to an aircraft;
- Smoking airside, except in a designated area;
- Driving on the manoeuvring area without permission;
- Failure to report a potentially hazardous incident;
- Driving in front of or behind an aircraft with aircraft engines still running and/or anti-collision warning lights on;
- Parking in areas marked as parking unsafe or prohibited; and
- Leaving a vehicle unattended with the engine running on movement area.

Depending on the safety violation and previous history of the offender, the following are examples of disciplinary action that may be taken:

- Verbal caution, not recorded;
- Formal verbal caution, recorded on personal employment file;
- Formal written caution, recorded on personal employment file for a specified period;
- Temporary airside driving ban for driving offences with requirement for retraining and testing;
- Permanent airside driving ban, for serious or persistent driving offences; and
- Temporary or permanent withdrawal of airside pass, or disciplinary action leading to downgrading, suspension or dismissal.

SECTION 2 – SAFETY RISK MANAGEMENT

2.1 Hazard Identification

The SMS Manager plays a key role and is central to the identification of hazards. As part of his or her daily responsibilities, the SMS Manager is expected to occasionally tour the airport and its landside facilities as applicable. While there, the SMS Manager's role includes the observation of operations, maintenance and construction activities to ensure that safe practices and procedures are being followed. The SMS Manager is also expected to talk with any available personnel working on the airport to determine if they have any safety concerns or questions. A combination of this personal approach and an effective reporting system should identify a large portion of the hazards that exist. As the programme matures and data is collated, trend analysis can become an effective source of hazard identification.

2.1.1 Hazard Reporting

In the event that an accident or incident occurs and the aerodrome Operations Supervisor is not available, notify the Island Administrator who will record the appropriate information as needed and communicate with the Airport Authority SMS Manager. These procedures are very important to ensure timely investigation of the occurrence and for all concerned to benefit the most from lessons learned as a result of the occurrence. The following sections are for information purposes and relate to airside occurrences.

2.1.2 Hazard Investigations

The sole objective of the investigation of an occurrence shall be the prevention of future occurrences. It is not the purpose of this activity to assign blame or liability. For accidents, the AE may order the investigation by general or special order and appoint any person for the purpose of carrying out such investigation.

Depending on the size and complexity of the investigation, nature of accident and investigation skills available, BCAD may constitute appropriate groups as contained in guidelines on ICAO Doc 9756 Vol. I after obtaining information from the site and analysing the preliminary information and evidences on the accident. In addition, the BCAD may order the investigation of any serious incident involving an aircraft or a person associated with the maintenance and operation of aircraft, or both. Incidents other than serious incidents shall be investigated by an office appointed by the AE.

2.1.3 Hazard Responsibility

The Operations Supervisor and/or the Island Administrator or Island Security personnel closest to the site of accident/ Serious Incident is responsible to take all immediately and reasonable measures to protect the evidence and to maintain safe custody of the aircraft including its parts thereof and contents until the arrival of the Inspector of Accidents/ Inquiry Officer at the scene whenever an accident/serious incident occurs at a place under their jurisdiction. Action must be taken for arranging for guarding of the wreckage including the preservation, by photographic or other means, of any evidence which might be removed, effaced, lost or destroyed. This issue is more completely handled in the Airport Emergency Plan.

2.2 Risk Assessment and Mitigation

The purpose of identifying the hazards and assessing the airside risks is to determine whether enough has been done to prevent an incident or accident that may lead to fatalities, injuries and ill health, and/or damage to aircraft. Risk assessment can also indicate what improvements need to take priority, and thereby assist in developing budgets and business cases. A formal hazards identification and risk management process will be conducted:

- ✈ At least once a year;
- ✈ When major operational changes are planned; and
- ✈ When new facilities are going to be constructed.

2.2.1 The Seven Step Risk Assessment process

A seven step assessment process will be used for the hazards identification and risk management process. If the hazard has already been identified it will be necessary to start at step 3 of the seven step process described below:

- Step 1- Development of a complete description of the system to be evaluated and of the environment in which the system is to be operated;
- Step 2- Identification of hazards;
- Step 3- Estimation of the severity of the consequences of hazard occurring;
- Step 4- Estimation of the likelihood of a hazard occurring;
- Step 5- Evaluation of risk;
- Step 6- Mitigation of risk; and
- Step 7- Development of safety documentation.

For each hazard identified, the risk index is to be calculated based on the severity of the event and likelihood of occurrence as follows:

Qualitative Measures of Severity

Level	Aviation Definition	Meaning/Description
1	Insignificant	No injuries, low financial loss (little consequences).
2	Minor	Nuisance, operating limitations, use of emergency procedures, possible First aid treatment required, medium financial loss.
3	Major	Serious incident, significant reduction in safety margins, medical treatment required (injury to persons), high financial loss.
4	Hazardous	Major equipment damage, serious injuries, large reduction in safety margins, major financial loss.
5	Catastrophic	Destruction of equipment, death, huge financial loss.

Qualitative Measures of Likelihood

Level	Likelihood	Description
5	Almost Certain	Is expected to occur in most circumstances.
4	Likely	Will probably occur at some time.
3	Possible	Might occur at some time.
2	Unlikely	Could occur at some time.
1	Rare	May occur in exceptional circumstances.

Risk Assessment Matrix

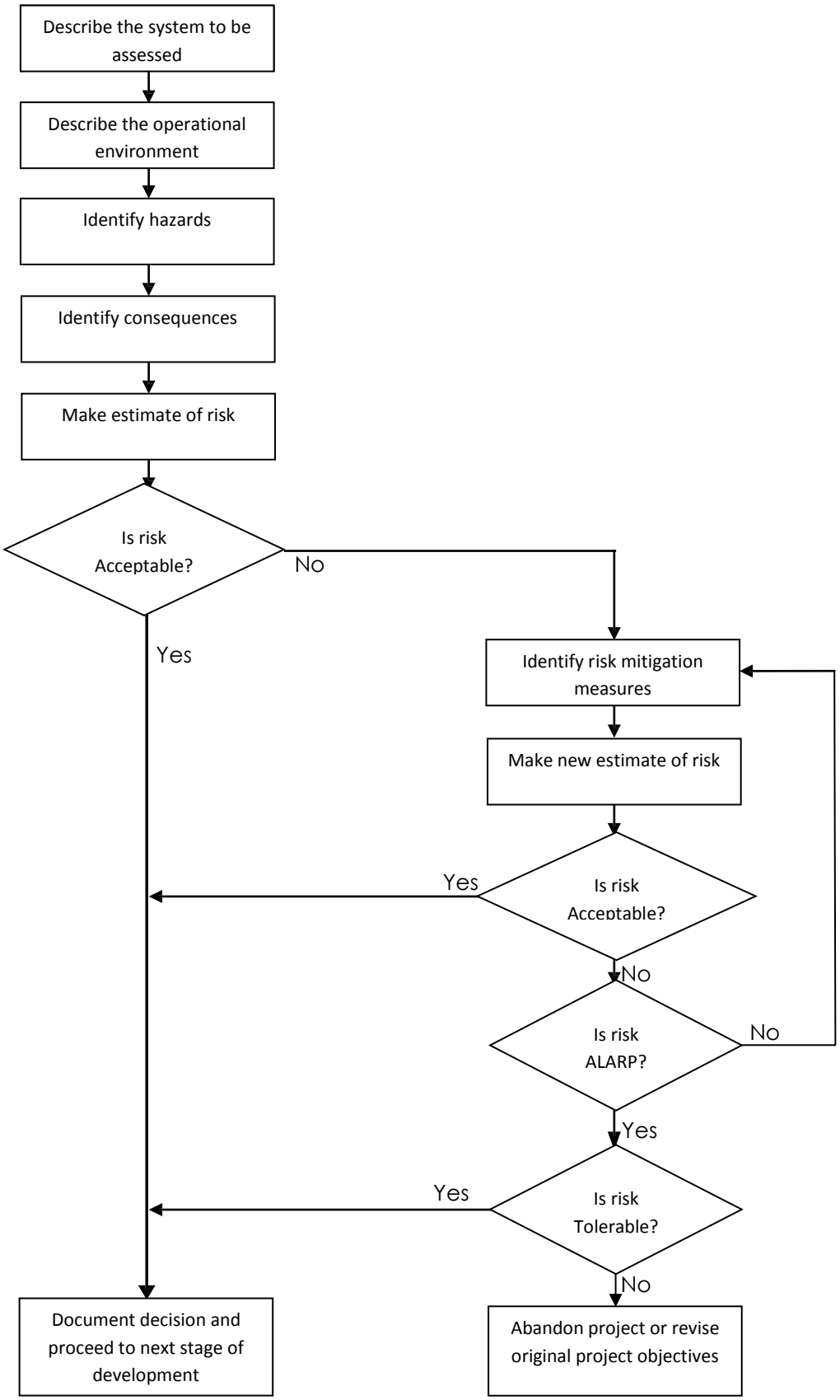
Likelihood		Consequence				
		Insignificant	Minor	Major	Hazardous	Catastrophic
		1	2	3	4	5
Almost certain	5	M	H	E	E	E
Likely	4	M	M	H	E	E
Possible	3	L	M	H	H	E
Unlikely	2	L	L	M	H	H
Rare	1	L	L	L	M	H

Resulting Risk Legend

E	Extreme risk, unacceptable under existing conditions, immediate action required
H	High risk, acceptable based on risk mitigation, senior management decision needed
M	Moderate risk, acceptable based on risk mitigation, management decision possible
L	Low risk; manage by routine procedures

The [Airport Name] Risk Register can be found in **Appendix C**. The register is used to keep track of all hazards identified at the airport, their associated level of risk as calculated using the ranking previously described, the associated mitigation measure(s) and the residual risk calculated post-implementation of the risk treatment/controls as validated by the SMS Manager.

The [Airport Name] SMS process for Risk Management and Safety Assessment is summarized in the flow chart below.



SECTION 3- SAFETY ASSURANCE

3.1 Safety Performance Monitoring and Measurement

In any system, it is necessary to set and measure performance outcomes in order to determine whether the system is operating in accordance with expectations, and to identify where action may be required to enhance performance levels to meet these expectations.

The Acceptable Level of Safety (ALoS) expresses the safety goals (or expectations) of an oversight authority (BCAD), an operator or a service provider. It provides an objective in terms of the safety performance operators/service providers should achieve while conducting their core business functions, as a minimum acceptable to BCAD. It is a reference against which BCAD can measure safety performance. In determining an acceptable level of safety, it is necessary to consider such factors as the level of risk applicable, the cost/benefits of improvements to the system, and public expectations on the safety of the aviation industry. In practice, the concept of acceptable level of safety is expressed by two measures/metrics i.e., safety performance indicators and safety performance targets, and implemented through various safety requirements. The following explains the use of these terms:

- Safety performance indicators are a measure of the safety performance of a department. Safety indicators should be easy to measure and be linked to the major components of a company's SMS. Safety indicators will therefore differ between departments, aircraft operators, airport concessionaires or ATS providers.
- Safety performance targets (sometimes referred to as goals or objectives) are determined by considering what safety performance levels are desirable and realistic for individual departments, operators, concessionaires or service providers. Safety targets should be measurable, acceptable to stakeholders, and consistent with SMS.
- Safety requirements are needed to achieve the safety performance indicators and safety performance targets. They include the operational procedures, technology, systems and programmes to which measures of reliability, availability, performance and/or accuracy can be specified.

The relationship between acceptable level of safety, safety performance indicators, safety performance targets and safety requirements is as follows:

- **Acceptable level of safety** is the overarching concept;
- **Safety performance indicators** are the measures/metrics used to determine if the acceptable level of safety has been achieved;
- **Safety performance targets** are the quantified objectives pertinent to the acceptable level of safety; and
- **Safety requirements** are the tools or means required to achieve the safety targets.

Safety indicators and safety targets may be different (for example, the safety indicator is that 100% of staff are trained in the SMS in the first phase of the implementation of the SMS, and the safety target is a 30% increase in the safety culture of staff), or they may be the same (for example, the safety indicator is that 100 % of staff are trained in the SMS in the first phase of the implementation of

the SMS and the safety target is that there is a 0% acceptance of having an employee not trained in the SMS). Safety indicators and safety target are reviewed annually during the Management Review described further.

3.2 Change Management

Hazards may inadvertently be introduced in an operation when there is change. Effective safety management requires that hazards be systematically and proactively identified and that risk management strategies be developed, implemented and subsequently evaluated. The objective is to reduce the safety risks resulting from changes to the provision, management or administration, of the Airport Services and products to a level ALARP. Change management is applied to a wide scope of activities; it is not limited to changes to services and systems but also extends to programmes and products. As well, it includes not only technical changes but also management and administration changes such as organisation structure, policies and procedures. Change management should be applied whenever:

- A major organisational change is being planned;
- The organization is undergoing rapid expansion or contraction;
- Introduction of new equipment or facilities is being considered;
- Existing equipment is being decommissioned;
- Introduction of new procedures is being planned;
- Existing procedures are being revised;
- Changes to key personnel are taking place; and
- There are changes to the legislation that the organisation operates under.

There are three key requirements of the change management process. The first is to develop a Safety Management Plan (SMP), whose purpose is to:

- Identify the requirement for safety management activities upon the type of change and complexity (gap analysis);
- Describe the activities necessary to fulfil those safety management requirements;
- Schedule those safety management activities;
- Identify roles and responsibilities; and
- Allocate resources for the activities.

A key activity of the SMS Manager is the conduct of the risk analysis management process, in particular, how many Hazards Identification and Risk Analyses (HIRAs) will be required, which HIRA process will be required, which HIRA process(es) will be used, who is responsible for the HIRA, which stake holders will participate and when will the HIRA be conducted.

The second requirement is to apply a risk management process. Incorporating the appropriate system safety and human factors concepts and principles, that includes the following key activities:

- Hazard Identification – The system under study is systematically reviewed to identify the types

of hazards present and/or those that may be introduced into the system by the proposed changes.

- Risk Assessment/Analyses – Once the hazards have been identified, the associated risks must be described and evaluated, in light of any existing and proposed mitigation, in order to determine whether it has been reduced to ALARP.
- Risk Mitigation/Control – If risks are not at a level that is as low as reasonably practicable, then further mitigation is required and risk control options are designed to mitigate the risk by either eliminating the hazard if possible, or reducing the frequency of the loss and/or consequences of the loss should it occur.
- Risk Monitoring/Evaluation – Risk monitoring is important given the assumptions made in relation to mitigation and the continuously changing aviation environment. Risk monitoring has four primary functions:
    - To detect and adapt to changing circumstances/SMS remains effective and relevant;
    - To ensure that risk control and mitigation options are achieving the expected results;
    - To verify correctness of assumptions (are we doing what we said?); and
    - To ensure proper implementation of risk control and communications strategies.

The third and final requirement of the change management process is the preparation of an annual Management Review Report (MRR).

3.2.1 Management Review Report

The [Airport Name] will perform an annual review of its SMS to evaluate its effectiveness. The review is coordinated by the SMS Manager. In this management review safety objectives and performance measures are evaluated, among other things.

If the Safety Management Plan describes what safety management activities are planned, the MMR describes the safety management activities that were undertaken along with the results of those activities. In general, the MMR will document the following:

- Both the current baseline and the change in sufficient detail to allow as understanding of the safety issues including the known functional/performance characteristics of the system, equipment or facility;
- The impact of the change on operations;
- The operational risk management methodology(ies) used to identify the hazards and assess the risks;
- The risk control strategies identified, together with evidence that the mitigations are accurate and complete based on the thoroughness of the hazard analysis and risk assessment; and
- Conclusions, including any assumptions, limitations and a statement that safety risks have been reduced to ALARP.

Consultation should be sought with the SMS Manager on when to apply the change management

process. By undertaking these activities, the Airports Authority will be proactively identifying the hazards and managing the risks before the changes are implemented. Not only does this make sense from a safety perspective; it is also a much more cost-effective to not have to go back to the drawing board and address safety issues that were missed.

Figure 1 illustrates how all the elements of a SMS work together to create an ever-changing and always improving dynamic safety culture capable of maintaining safety while accepting change.

Figure 1. Dynamic Safety Culture

The management review protocol is found in **Appendix D** of this report.

3.3 Continuous Improvement of the SMS

The best way to ensure correct operation of the organisations SMS programme is the audit process. Audits focus on the integrity of the organisations SMS, and periodically assess the status of safety risk controls. Audits are not intended to be in-depth audits of the technical processes but rather they are intended to provide assurance to managers that activities within their areas of responsibility are being conducted safely and conform to the safety management system requirements. It will also demonstrate to all employees that the management is taking a continuing interest in safety. Employees should not see auditing as a threat but rather as a co-operative activity to improve the level of service.

There are two general types of audits that we will be subject to on a regular basis:

1. Internal audits to confirm conformance with the safety management system (the Management Review is seen as a part of the Internal audit process); and
2. External audits to confirm conformance with the regulatory requirements.

Appendix 5 to Section 21.497 of Schedule 21 of the BASR state that the Aerodrome Manual shall be:

- A reference document providing a check-list of aerodrome certification standards that must

be maintained and the level of airside services at the aerodrome. Information provided in the Aerodrome Manual will enable the Authority to assess the suitability of the aerodrome for the aircraft operations proposed and to judge an applicant's fitness to safely operate the aerodrome;

- A basic reference guide for conducting site inspections for granting an aerodrome certificate and for subsequent safety inspections as it is a reference document agreed between the aerodrome operator and the Authority with respect to the standards, conditions and the level of service to be maintained at the aerodrome.

As such, the Aerodrome Manual is expected to form the basis of the audit checklists as they relate to the quality assurance process for ensuring technical compliance standards linked to the safe operation of the aerodrome based on ICAO's Annex 14 Volume 1.

The SMS Manager will arrange for an annual internal audit of the Safety Management System, including airport facilities and equipment. Additionally, the SMS Manager will arrange for an external audit and inspection for the evaluation of contractors, sub-contractors or tenants of the airport to comply with the Aerodrome Manual standards.

All audits conducted, whether internal or external shall be conducted by a suitably qualified safety expert(s) who shall prepare and sign the report. Credentials shall be provided in advance to the Airport Authority SMS Manager.

3.3.1 Safety Oversight of Third Party Contractors

Based on the need for auditing these entities [Airport Name] should ensure that all contracts agreed with third party contractors will ensure compliance with BCAD regulatory requirements. Related training and direct oversight of third party contractors will be provided by the [Airport Name] based on requirements identified in each respective work plan.

3.3.2 The Audit Process

The requirements for aerodrome internal safety audits are intended to form part of the Aerodrome Manual and are detailed in Section 21.523 (Aerodrome Operator's Internal Safety Audits and Reporting) of Schedule 21 of the BASR. This section requires that:

- The aerodrome operator shall arrange for audits of the SMS, including inspections of the aerodrome facilities and equipment, and such audit:
    - Shall cover the aerodrome operations and maintenance; and
    - Include an external audit and inspection programme for evaluation of other users, including fixed-base operators and organisations working at the aerodrome as appropriate.
- The audits referred to above shall be carried out over 12 months, or less, as agreed to by the Airport Authority.
- The SMS Manager shall ensure that the audit reports, including the report on the aerodrome facilities, services and equipment, are prepared by suitably qualified safety personnel.
- The SMS Manager shall retain a copy of the report(s) referred to above for a period of 24

months and the AE may request a copy of the report(s) for its review and reference.

- The report(s) referred to above shall be prepared and signed by the persons who carried out the audits and inspections.
- The SMS Manager shall ensure that deficiencies identified during audits are corrected in a timely manner as agreed upon with the auditors.

The SMS Manager should base the audit checklists on the details of the Aerodrome registration requirements and related reference provided in Schedule 21 of the BASR.

A formal notification of intention to perform the audit is forwarded to the section to be audited in adequate time for any necessary preparations to be made. The section may be requested to provide preparatory material in advance of the actual audit, for example- training records. At the opening meeting, the person conducting the audit should briefly present the background for the audit, its purpose, and any specific issues to be addressed by the audit.

The techniques for gathering the information on which the audit team's assessment will be made include:

- ✈ Review of records;
- ✈ Interviews with staff; and
- ✈ Observations by the audit team.

The auditor would work systematically through the items on the relevant checklist. Once the audit activities are completed, the audit or would review all observations and compare them against the relevant regulations and procedures. An assessment would be made of the seriousness of all discrepancies. The audit would not focus only on negative findings. An important objective of the safety audit is also to highlight good practices.

A closing meeting would be held to brief local personnel wit responsibilities at the aerodrome on the audit observations and any resulting recommendations. At this time a local responsible individual would be given a chance to correct any misunderstandings. Dates for issuing an interim audit report and for receiving comments on it would be mutually agreed upon. A draft copy of the final report should be left with the Airport Authority management.

At the completion of an audit, planned remedial actions would be documented for all identified areas of concern. It is the responsibility of the SMS Manager to develop a corrective action plan setting out the actions to be taken to resolve identified deficiencies or safety shortcomings within an agreed time period. When completed, the corrective action plan should be forwarded to the AE. The final audit report will include this corrective action plan and detail any follow-up audit action proposed. The SMS Manager is responsible for ensuring the timely implementation of the appropriate corrective actions.

The audit report would be an objective presentation of the results of the safety audit. As soon as possible after completion of the audit, an interim audit report would be forwarded to the AE. Any comments received would be taken into consideration in the preparation of the final report, which constitutes the official report of the audit.

An audit follow-up involves management of change. Upon receipt of the final audit report,

management needs to ensure that progress is made to reduce or eliminate the attendant risks. The primary purpose of an audit follow-up is to verify the effective implementation of the corrective action plan. Follow-up is also required to ensure that any action taken pursuant to the audit does not in any way degrade safety. In other words, new hazards with potentially higher risks must not be allowed to enter the system as a consequence of the audit. Where a follow-up visit has been made, a further report of this visit will be prepared. This report will clearly indicate the current status of the implementation of the agreed corrective actions. If any non-compliance, deficiency or safety shortcoming remains unresolved, the auditor will highlight this in the follow-up report.

SECTION 4 - SAFETY PROMOTION

Training requirements for Aerodrome Certificate holders is generally described in Schedule 21 of the BASR. Section 21.145 (Competence of Operational and Maintenance Personnel), and requires that the aerodrome operator shall employ an adequate number of qualified and skilled personnel to perform all critical activities for aerodrome operation and maintenance. It further requires that the aerodrome operator shall employ as qualified and skilled personnel only those persons possessing the competency certification required by the Authority for such personnel. As such, there is an expectation for the aerodrome operator to establish a training and qualification programme for other safety related staff that do not require a certificate or license.

4.1 Safety Training and Education

An organisations safety culture is linked to the success of its safety management training program. All personnel must understand the organisation's safety philosophy, policies, procedures and practices, and they should understand their roles and responsibilities within that safety management framework. Safety training should begin with the initial familiarization of employees and continue throughout their employment. Specific safety management training should be provided for staff members who occupy positions with particular safety responsibilities. The training programme should ensure that the safety policy and objectives of the organisation are understood and adhered to by all staff, and that all staff is aware of the safety responsibilities of their positions.

4.1.1 SMS Training

During the initial implementation of the SMS, specific training will be provided for existing staff. Once the SMS is fully implemented, the safety training needs of those other than the safety specialists should be met by incorporating the appropriate safety content into the general training programme for their positions.

The SMS Manager shall ensure that each staff comprehends the SMS manual within a period of one month from the date of reporting for duty. For this purpose a copy of the SMS Manual shall be made available. A certificate from the staff member shall be obtained stating clearly that he/she has read and understood all the provisions of the SMS Manual.

4.1.2 Wildlife Management Training

Section 21.583 of Schedule 21 of the BASR requires that each person who has assigned duties in respect of the airport wildlife management plan receives relevant training at least once every five years.

4.1.3 Training Records

Competency training requirements for each area of work will be documented and training files maintained for employees, including management, to assist in identifying and tracking employee training requirements. Documented competency training policies for each individual functional area can be found in respective schedule of the BASR. Training records of each individual's courses must be kept for a period of five years in their training file.

4.2 Safety Communications

Safety communication is an essential foundation for the development and maintenance of an adequate safety culture. There are three basic elements used in safety communication:

- Safety communication;
- Consultation; and
- Reporting

The communication element captures the processes used to ensure the open exchange of safety-related information both externally and internally to the airport. This element plays a critical role in ensuring that all the risks present in relation to civil aviation requirements are recognized, registered and mitigated and the information gained, plus improvement measures, are disseminated across all staff.

Consultation with all stakeholders of the [Airport Name], including customers and suppliers where appropriate, on all aspects of safety is an important element of safety management as it formalizes links of communication among the respective parties to aviation safety,

Reporting the results of safety investigations, safety reviews, safety audits and overall safety activities and performance to the appropriate audience has many benefits. It promotes transparency, commitment, ownership of safety issues. The most benefit of reporting safety issues and information is that it allows similar problems to be reported but most of all it allows for potential problems or issues to be eliminated before they happen. Prevention is always best.

The [Airport Name] is committed to ensuring that all individuals with access to airside are informed about the safety policies and objectives, how well the airport is meeting safety objectives, results of accident and incident investigations, new safety practices, and other matters dealing with safety. Some of the methods to be considered are discussed further.

4.2.1 Safety Meetings and Other Communication Methods

At least once per year, the SMS Manager will hold a safety meeting with the Operations Supervisor and other Island stakeholders with support roles at the airport. The purpose of these meetings is to:

- Report on safety performance;
- Summarize the initiatives and action taken, or planned, to address safety concerns and potential hazards;
- Report on lessons learned and action taken as a result of any incidents and accidents; and
- Discuss in an open forum the safety concerns that any of the participants might have.

Other Communication methods include the following:

- Bulletin boards on airport facilities where appropriate;
- [Airport Name] Safety Newsletter;
- [Airport Name] Website link on BCAD Web portal;
- E-mail to staff where appropriate; and
- Site visits by the SMS Manager

Tier 3 Airport SMS Manual

APPENDIX A

SAFETY REPORT

AIRPORT SAFETY (SMS) REPORT

Date:	Time:	Log No.:
Reported by (*optional*): Name: Signature:	Tel : Department/Company:	

PART A: TO BE COMPLETED BY THE PERSON REPORTING THE HAZARD/INCIDENT/ACCIDENT

PART A
HAZARD/INCIDENT/ACCIDENT: Air operations/Runway ☐ Ground Operations /Apron ☐ Other ☐

4. I consider that the hazard / my report is:
   Critical/urgent ☐ Important ☐ Of a general nature ☐

5. In my opinion, I think that the potential that this hazard/Incident/Accident may be repeated is:

   Not likely 1 2 3 4 5 Very likely

6. **Description** (include weather conditions, nature of the threat, location on the airport, and the potential result/consequence or effect. You can also add diagrams, reports, or pictures):

Please send this report to the Airport Authority SMS Manager

This form should be used to report any airport hazard that has caused or could cause an accident or incident. This form is also used to report actual incidents and accidents. Send to the SMS Manager as soon as possible after the hazard is identified. You can submit the form anonymously by omitting relevant details.

SMS Manager to complete the following sections including risk assessment (PART B) on further pages as appropriate

Date this report was received: _____ **Safety Log #:** _____

Level of risk assessed as (Check the box and attach risk assessment as necessary):

E	Extreme risk, immediate action required	
H	High risk, senior management attention needed	
M	Moderate risk, management responsibility must be specified	
L	Low risk; manage by routine procedures	

Referred to AE: Y / N

Actions required (attach additional pages if there is insufficient room):

_____
_____
_____
_____
_____
_____

Person(s) responsible for implementing mitigation/corrective action:

_____
_____

Completion date(s) due: _____

Person making the report (if known) advised of outcome: Y / N **Date**: _____

Airport Risk Register updated: Y / N **Date**: _____

Signed: _____

Name: _____ (SMS Manager) **Date**: _____

Note: Follow-up to verify effectiveness of the mitigation must be done within one month of the event and checked off here during the Management review:

Initial and Date. Add note as appropriate

PART B: TO BE COMPLETED BY THE SMS MANAGER

1. **Immediate causes (see checklist forms):**

2. **Root causes (see checklists form):**

3. **Recommendation(s) to eliminate or control the risk and prevent a recurrence:**

   3a. Immediate:

   3b. Long-term:

4. **Communicating feedback** (to who, how, when)

Signature: **Date**

Identification of the immediate causes – [Name] Airport

Failure to use protective measures

- ☐ improper use of appropriate safety equipment
- ☐ failure to advise
- ☐ protection or warning systems disabled
- ☐ maintenance or operation of non-insulated or powered on equipment
- ☐ failure to use safety equipment
- ☐ failure to secure the equipment

Failure to observe accepted guidelines

General:

- ☐ failure to comply with proper start-up/commissioning procedures
- ☐ failure to comply with personal safety guidelines or standards
- ☐ failure to comply with proper operating procedures or methods
- ☐ failure to comply with proper maintenance procedures or methods

Details:

- ☐ operation of unauthorized equipment
- ☐ wrong position or posture
- ☐ incorrect placement
- ☐ effort exceeding physical capacity
- ☐ dangerous mixture of chemicals
- ☐ improper loading
- ☐ work performed at wrong speed
- ☐ risk taken consciously (by group)
- ☐ risk taken consciously (by individual)
- ☐ bickering

Misuse of tools or equipment

- ☐ incorrect use of equipment
- ☐ incorrect use of tools
- ☐ use of defective equipment (consciously)
- ☐ use of defective tools (consciously)

Inattention / Lack of a sense of the risk

- ☐ incorrect decision or lack of judgment
- ☐ distracted
- ☐ lack of attention to the surface or environment

Other blameworthy acts ☐ Specify _____

Blameworthy conditions

Faulty materials

	Specify		*Specify*
☐ defective equipment		☐ ill-prepared tools	
☐ defective tools		☐ ill-prepared equipment	
☐ non-compliant equipment		☐ non-compliant tools	

Reason:

☐ wear ☐ corrosion ☐ other (specify)

Controls or protection do not meet needs

	Specify		*Specify*
☐ non-compliant protection devices		☐ faulty protection devices	
☐ personal protective equipment non-compliant		☐ faulty warning systems	
☐ non-compliant warning systems		☐ faulty personal protective equipment	
☐ isolation of the procedure or equipment non compliant			

Risks related to airport operations

- ☐ risk of fire and explosion
- ☐ exposure to noise
- ☐ open systems
- ☐ exposure to radiation
- ☐ exposure to extreme temperatures
- ☐ exposure to chemicals dangerous
- ☐ electric system powered on

Risks in the workplace

- ☐ work at height
- ☐ non-compliant layout and clearance, congestion or projections
- ☐ insufficient lighting
- ☐ improper maintenance
- ☐ insufficient ventilation

Identification of the root causes – work related factors – [Name] Airport

Non-compliant design / engineering

May apply to facilities, equipment, tools, etc.

- ☐ not applicable
- ☐ poor technical design
- ☐ poor economic design
- ☐ improper evaluation - potential loss
- ☐ standards, specifications or design criteria non compliant
- ☐ insufficient follow-up of the activity
- ☐ improper evaluation of operating preparedness
- ☐ insufficient monitoring of operation at outset
- ☐ improper evaluation of changes and/or poorly documented changes
- ☐ other (specify)

Non-compliant maintenance procedures

Include conditions that may affect the maintenance system

- ☐ not applicable
- ☐ inadequate preventive maintenance
- ☐ inadequate corrective maintenance
- ☐ excessive wear
- ☐ life unduly prolonged
- ☐ insufficient inspection/follow-up
- ☐ inadequate evaluation of needs
- ☐ other (specify)

Incompatible objectives

Choose where the conflicting objectives come from different management systems. A change in these conditions normally has an impact on the management philosophy:

- ☐ not applicable
- ☐ system objectives VS safety objectives (i.e., costs, savings vs. personal safety)
- ☐ personnel objectives vs. safety objectives (i.e., perception of a inappropriate rewards system).
- ☐ system VS system objectives (i.e., reduce costs by reducing manpower)
- ☐ other (specify)

Conditions conducive to errors

Conditions in the work environment conducive to causing errors or infractions

- ☐ not applicable
- ☐ environmental stress:
  - ☐ noise
  - ☐ atmospheric conditions
  - ☐ lack of oxygen
  - ☐ exposure to health hazards
  - ☐ other (specify)
- ☐ work-related stress
  - ☐ monotonous or repetitive tasks
  - ☐ confusing requests
  - ☐ demands extreme concentration or perception
  - ☐ extreme physical or physiological effort required
  - ☐ fatigue due to the workload or the hours of mental work
  - ☐ fatigue due to sensory overload
  - ☐ other (specify)

Non-compliant work procedures

Factors affecting the organization of workload:

- ☐ not applicable
- ☐ absence or inadequacy of safety meetings and/or procedures
- ☐ insufficient reference documents, directives or manuals
- ☐ lack of direction at the outset
- ☐ non-compliant labour standards
- ☐ lack or inadequacy of workplace safety analysis for to hazardous activities
- ☐ shift change procedures non compliant
- ☐ inadequate identification and evaluation of potential loss
- ☐ negative declaration (i.e., without a declaration, we assume that everything is fine).
- ☐ faulty application of the rules regarding personal protective equipment
- ☐ other (specify)

Poor training

This section focuses on the training provided by the company:

- ☐ not applicable
- ☐ company training non-compliant
- ☐ lack of training by the company
- ☐ training requirements not identified in the job description
- ☐ training deemed ineffective (boring, lacking an incentive to learn)
- ☐ the requirements of the job do not match the training
- ☐ knowledge verification systems are insufficient or missing
- ☐ other (specify)

...continued

Identification of the root causes - human factors – [Name] Airport

Communication failures

Includes the communication tools and communications processes:

- ☐ not applicable
- ☐ incomplete or unclear instructions
- ☐ poor communication of data, regulations and occupational health and safety guidelines
- ☐ insufficient communication tools
- ☐ insufficient horizontal communication (i.e., within the group)
- ☐ insufficient vertical communication (i.e., between the supervisor and the employee)
- ☐ insufficient communication between organizations
- ☐ absence of terminology standards and phraseology or misuse thereof
- ☐ other (specify)

_____

Organizational failures

Focuses on systems or programs within the organization:

- ☐ not applicable
- ☐ insufficient planning
- ☐ lack of clarity or inconsistencies in the hierarchical relationships
- ☐ lack of clarity or inconsistencies in the assignment of responsibility
- ☐ incorrect or insufficient delegation of authority
- ☐ audit/inspection programme insufficient
- ☐ accident and investigation reporting system insufficient
- ☐ insufficient purchases
- ☐ bad assignment (wrong person assigned to the task)
- ☐ lack of performance measurements and evaluation and feedback
- ☐ lack of knowledge of the managers' role
- ☐ absence or inadequacy of safety meetings
- ☐ insufficient promotion of security (visibility, acceptance)
- ☐ insufficient control of change system

other (specify)

_____

_____

Physical capacity

- ☐ not applicable
- ☐ sensitivity to substances or allergies
- ☐ visual impairment
- ☐ hearing impairment
- ☐ other sensory impairment
- ☐ respiratory difficulties
- ☐ other permanent physical disability
- ☐ temporary disabilities
- ☐ limited capacity to maintain body position
- ☐ limited body movement
- ☐ other (specify)

_____

_____

Mental capacity

- ☐ not applicable
- ☐ fears and phobias
- ☐ emotional disorders
- ☐ mental illness
- ☐ difficulty understanding
- ☐ learning disability
- ☐ poor judgment
- ☐ faulty memory
- ☐ poor coordination or unacceptable reaction time
- ☐ other (specify)

_____

_____

Physical stress

The physical circumstances of the individual that can lead him to make mistakes or make him more vulnerable to injury or disease:

- ☐ not applicable
- ☐ injury or illness
- ☐ fatigue due to lack of rest
- ☐ hypoglycemia
- ☐ under effect of alcohol or drugs
- ☐ other (specify)

_____

_____

Mental stress

The mental circumstances of the individual that can lead him to make mistakes or make him more vulnerable to injury or disease:

- ☐ not applicable
- ☐ frustration
- ☐ conflicting demands
- ☐ issues of concern
- ☐ unclear instructions
- ☐ 'absurd' or 'degrading' activities.
- ☐ other (specify)

_____

_____

Undue risk taken

Choose when conditions are specific to the individual or affect him directly.

The recommendations are generally the responsibility of the supervisor and the employee:

- ☐ not applicable
- ☐ rewarded for incorrect performance
- ☐ punished for good performance
- ☐ lack of incentives
- ☐ bad example from supervisors
- ☐ insufficient identification of critical safe behaviour
- ☐ insufficient reward for critical safe behavior
- ☐ inappropriate aggression
- ☐ other (specify)

_____

_____

Lack of knowledge or skills.

Conditions normally specific to an individual but that may be present within a group:

- ☐ not applicable
- ☐ lack of experience
- ☐ insufficient starting guidelines
- ☐ work rarely done
- ☐ lack of supervision
- ☐ lack of practice
- ☐ instructions misunderstood
- ☐ other (specify)

_____

_____

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APPENDIX B

SAFETY REPORT/INCIDENT LOG

SAFETY REPORT/INCIDENT LOG

Safety Report Log No.	Activity	Hazards associated with this activity	Probability	Consequence	Initial Level of risk	Date of Report	Initials

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APPENDIX C

RISK REGISTER

RA FORM 1: Risk Assessment – [Airport Name]						
Risk Ref No.	Activity	Hazards associated with this activity	Impacts if the event occurs	Probability	Consequence	Level of risk

RA FORM 2: Evaluation of mitigation measure effectiveness –[Airport Name]									
Risk Ref No. (RA FORM 1)	Mitigation measures Implemented					Probability	Consequence	Level of residual risk	Risk manager initials
	Elimination (date)	Substitution (date)	Separation (date)	Behaviour (date)	Administrative (date)				

Notes:

1. *You must assess the risk that results from each of the hazards that you have identified and add the risk rating in the column on RA FORM 1.*
2. *You must assess the residual risk after taking the risk treatments and controls into consideration and add the residual risk rating in the column of RA FORM 2. If the risk rating is above acceptable levels, you must introduce additional treatments and controls.*
3. *This Risk Register must be reviewed periodically by the SMS Manager. Any additional hazards that are identified must be added to the register and their risk assessed.*

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APPENDIX D

MANAGEMENT REVIEW GUIDANCE

D.1 Management Review Guidance

The Management review shall be scheduled at least one month in advance by the SMS Manager. The Accountable Executive (AE) shall have the ultimate responsibility to ensure its execution. The review should last only a single day during which the following (at a minimum) will be reviewed:

- A review of the safety policy to ensure its relevance;
- The results of the internal audit (quality assurance processes) as appropriate;
- The results of the safety culture survey;
- Employee interviews to ensure they are aware of their roles and responsibilities and to confirm the most effective communication and the effectiveness of training received;
- Progress in achieving safety objectives and goals;
- A review of safety reports (analysis of incidents/accidents and corrective action plans);
- A review of the follow-up from the last management review;
- A review of records and documents (maintenance, safety, retention period, etc.);
- All organisational or technical changes that may have an impact on airport operations;
- A review of the regulatory requirements (changes in applicable Regulations and Standards);
- A review of risk assessment reports; and
- Identification of practices to continuously improve operations.

The AE, in cooperation with the SMS Manager, has the discretion to consider additional material to add to the review protocol as appropriate. The expected results of the management review include:

- The achievement of airport safety objectives; and
- A report with recommendations for follow-up. All follow-up action resulting from the management review will be submitted to the AE to ensure they are done according to a schedule defined in the report.

ANNUAL MANAGEMENT REVIEW REPORT

Review date:

Report for calendar year:

Follow-up measures from last management review

DESCRIPTION OF THE MEASURE	REPORT
Description of the necessary follow-up measure	Status (completed, overdue, in progress, etc.)

Safety Objectives Results

OBJECTIVE	PERFORMANCE/STATUS
Safety objective	Results

Results of the internal audit (Quality Assurance)

- Summary of last audit (key points only) and follow-up.

Communications

- Summary of the main activities for communicating the SMS, roles and responsibilities, training, specific initiatives (internal and external).

Summary of follow-up measures

- List of measures completed and their effectiveness, % completed, etc.

Identification of hazards

Using a proactive identification process, identify:

- Lessons learned in the previous year;
- New initiatives;
- Changes that should be considered.
- Best practices that should be considered; or
- New performance measures that should be adopted.

N.B., these last points are used to generate discussion.

THE MANAGEMENT REVIEW CHECKLIST PROTOCOL:

ITEM TO BE VERIFIED	OBSERVATIONS/COMMENTS	VERIFIED BY
Review of the safety policy		
Safety culture survey results		
Employee interviews to ensure they are knowledgeable about their roles and responsibilities		
Employee interviews to determine the most effective means of communication and the effectiveness of training		
Review of management of files (record keeping)		
Review of the regulations		
Review of safety reports		
Review of the risk profile		
Other:		

The following manuals and plans were reviewed and updated:

Manual Reviewed	Date	Comments
Operating manual		
Emergency plan		
Wildlife management plan		
SMS Manual		
Other		

Verified by: _____

Appendix C – SMS Gap Analysis

C.1 SMS GAP ANALYSIS

The requirements for aerodrome SMS Manuals are prescribed in the BASR Schedule 1, Appendix 1 to 1.380: Framework of Safety Management System, as well as in Schedule 21. Schedule 1, Appendix 5 to 21.497, is written as an Implementing Standard. This Standard specifies the framework for the implementation and maintenance of an SMS. The framework comprises four (4) components and twelve (12) elements as the minimum requirements for SMS implementation. These components and elements are:

- **Component 1: Safety policy and objectives (1.0)**

  Element 1: Management commitment and responsibility (1.1)
  Element 2: Safety accountabilities (1.2)
  Element 3: Appointment of key safety personnel (1.3)
  Element 4: Coordination of emergency response planning (1.4)
  Element 5: SMS documentation (1.5)

- **Component 2: Safety risk management (2.0)**

  Element 6: Hazard identification (2.1)
  Element 7: Safety risk assessment and mitigation (2.2)

- **Component 3: Safety assurance (3.0)**

  Element 8: Safety performance monitoring and measurement (3.1)
  Element 9: The management of change (3.2)
  Element 10: Continuous improvement of the SMS (3.3)

- **Component 4: Safety promotion (4.0)**

  Element 11: Training and education (4.1)
  Element 12: Safety communication (4.2)

A SMS gap analysis was initiated as part of the field visits in order to satisfy the requirements of the Institutional Analysis required under Task 2 of the consultancy report. The Base Document used for the SMS Gap Analysis was *Appendix 7 to Chapter 5 of ICAO Doc 9859 AN/474 Safety Management Manual (SMM)* with additions from Transport Canada Canadian Aviation Regulations as Best Management Practices (BMPs)

C.2 SMS GAP ANALYSIS CHECKLIST

C.2.1 INITIAL GAP ANALYSIS CHECKLIST (TABLE 5-A7-1)

The initial gap analysis checklist in Table C-1 (from the ICAO reference document Table 5-A7-1) can be used as a template to conduct the first step of an SMS gap analysis. This format with its overall "Yes/No/Partial" responses will provide an initial indication of the broad scope of gaps and hence overall workload to be expected in preparing an SMS Implementation Plan. The

questionnaire is designed so it can be adjusted to suit the needs of the organisation and the nature of the service provided. This initial information should be useful to senior management in anticipating the scale of the SMS implementation effort and hence the resources to be provided. This initial checklist would need to be followed up by an appropriate implementation plan as per Tables 5-A7-2 and 5-A7-3 of ICAO Doc 9859 AN/474.

A "Yes" answer indicates that the organisation meets or exceeds the expectation of the question concerned. A "No" answer indicates a substantial gap in the existing system with respect to the question's expectation. A "Partial" answer indicates that further enhancement or development work is required to an existing process in order to meet the question's expectations.

Note: The SSP references in square [ ] brackets refer to guidance material in the SMM relevant to the gap analysis question. Components and Elements are as per the ICAO description when a numerical reference is indicated or in relation the Canadian Aviation Regulations (SMS) Framework when "[CAR]" is indicated before the numerical reference (BMP only).

Table C-1. SMS Gap Analysis Checklist

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
Component 1 — SAFETY POLICY AND OBJECTIVES			
Element 1.1 — Management commitment and responsibility			
1.1-1	Is there a safety policy in place? [5.3.7 to 5.3.15; 5.5.3]	□ Yes ✓ No □ Partial	
1.1-2	Does the safety policy reflect senior management's commitment regarding safety management? [5.3.7 to 5.3.15]	□ Yes □ No □ Partial N/A	
1.1-3	Is the safety policy appropriate to the size, nature and complexity of the organisation? [5.3.7 to 5.3.15]	□ Yes □ No □ Partial N/A	
1.1-4	Is the safety policy relevant to aviation safety? [5.3.7 to 5.3.15]	□ Yes □ No □ Partial N/A	
1.1-5	Is the safety policy signed by the Accountable Executive? [5.3.7 to 5.3.15; 5.5.3]	□ Yes □ No □ Partial N/A	
1.1-6	Is the safety policy communicated, with visible endorsement, throughout the [Organisation]? [5.5.3]	□ Yes □ No □ Partial N/A	
1.1-7	Is the safety policy periodically reviewed to ensure it remains relevant and appropriate to the [Organisation]? [5.5.3]	□ Yes □ No □ Partial N/A	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
Element 1.2 — Safety accountabilities			
1.2-1	Has [Organisation] identified an Accountable Executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the [Organisation], for the implementation and maintenance of the SMS? [5.3.16 to 5.3.26; 5.5.2]	□ Yes ✓ No □ Partial	
1.2-2	Does the Accountable Executive have full control of the financial and human resources required for the operations authorised to be conducted under the operations certificate? [5.3.16 to 5.3.26]	□ Yes □ No □ Partial N/A	
1.2-3	Does the Accountable Executive have final authority over all aviation activities of his organisation? [5.3.16 to 5.3.26]	□ Yes □ No □ Partial N/A	
1.2-4	Has [Organisation] identified and documented the safety accountabilities of management as well as operational personnel, with respect to the SMS? [5.3.16 to 5.3.26]	□ Yes ✓ No □ Partial	
1.2-5	Is there a safety committee or review board for the purpose of reviewing SMS and safety performance? [5.3.27 to 5.3.33; Appendix 4]	□ Yes ✓ No □ Partial	
1.2-6	Is the safety committee chaired by the Accountable Executive or by an appropriately assigned deputy, duly substantiated in the SMS manual? [5.3.27 to 5.3.33; Appendix 4]	□ Yes □ No □ Partial N/A	
1.2-7	Does the safety committee include relevant operational or departmental heads as applicable? [5.3.27 to 5.3.33; Appendix 4]	□ Yes □ No □ Partial N/A	
1.2-8	Are there safety action groups that work in conjunction with the safety committee (especially for large/complex organisations)? [5.3.27 to 5.3.33; Appendix 4]	□ Yes ✓ No □ Partial	
Element 1.3 — Appointment of key safety personnel			
1.3-1	Has [Organisation] appointed a qualified person to manage and oversee the day-to-day operation of the SMS? [5.3.27 to 5.3.33; 5.5.2; Appendix 2]	□ Yes ✓ No □ Partial	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
1.3-2	Does the qualified person have direct access or reporting to the Accountable Executive concerning the implementation and operation of the SMS? [5.3.27 to 5.3.33; 5.5.2; Appendix 2, 6.1]	□ Yes □ No □ Partial N/A	
1.3-3	Does the manager responsible for administering the SMS hold other responsibilities that may conflict or impair his role as SMS manager. [Appendix 2, 6.4]	□ Yes □ No □ Partial N/A	
1.3-4	Is the SMS manager's position a senior management position not lower than or subservient to other operational or production positions [Appendix 2, 6.4]	□ Yes □ No □ Partial N/A	
Element 1.4 — Coordination of emergency response planning			
1.4-1	Does [Organisation] have an emergency response/contingency plan appropriate to the size, nature and complexity of the organisation? [Appendix 3]	□ Yes □ No ✓ Partial	
1.4-2	Does the emergency/contingency plan address all possible or likely emergency/crisis scenarios relating to the organisation's aviation product or service deliveries? [Appendix 3, 4 f)]	□ Yes ✓ No □ Partial	
1.4-3	Does the ERP include procedures for the continuing safe production, delivery or support of its aviation products or services during such emergencies or contingencies? [Appendix 3, 4 e)]	□ Yes ✓ No □ Partial	
1.4-4	Is there a plan and record for drills or exercises with respect to the ERP? [Appendix 3, 5 c)]	□ Yes ✓ No □ Partial	
1.4-5	Does the ERP address the necessary coordination of its emergency response/contingency procedures with the emergency/response contingency procedures of other organisations where applicable? [Appendix 3, 4 d)]	□ Yes ✓ No □ Partial	
1.4-6	Does [Organisation] have a process to distribute and communicate the ERP to all relevant personnel, including relevant external organisations? [Appendix 3, 5 d)]	□ Yes ✓ No □ Partial	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
1.4-7	Is there a procedure for periodic review of the ERP to ensure its continuing relevance and effectiveness? [Appendix 3, 5 f)]	□ Yes ✓ No □ Partial	
Element 1.5 — SMS documentation			
1.5-1	Is there a top-level SMS summary or exposition document which is approved by the accountable manager and accepted by the CAA? [5.3.36 to 5.3.38]	□ Yes ✓ No □ Partial	
1.5-2	Does the SMS documentation address the organisation's SMS and its associated components and elements? [5.3.36 to 5.3.38; 5.4.1; Appendix 4]	□ Yes □ No □ Partial N/A	
1.5-3	Is [Organisation] SMS framework in alignment with the regulatory SMS framework? [5.3.36 to 5.3.38; 5.4.1; Appendix 4]	□ Yes □ No □ Partial N/A	
1.5-4	Does [Organisation] maintain a record of relevant supporting documentation pertinent to the implementation and operation of the SMS? [5.3.36 to 5.3.38; 5.5.5]	□ Yes □ No □ Partial N/A	
1.5-5	Does [Organisation] have an SMS implementation plan to establish its SMS implementation process, including specific tasks and their relevant implementation milestones? [5.4.4]	□ Yes ✓ No □ Partial	
1.5-6	Does the SMS implementation plan address the coordination between the service provider's SMS and the SMS of external organisations where applicable? [5.4.4]	□ Yes □ No □ Partial N/A	
1.5-7	Is the SMS implementation plan endorsed by the Accountable Executive? [5.4.4; 5.5.2]	□ Yes □ No □ Partial N/A	
[CAR] Element 1.6 Safety Management Planning			
[CAR] 1.6-1	Is there a process for setting goals for the improvement of aviation safety? [CAR 107.03 (b)]	□ Yes ✓ No □ Partial	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
Component 2 — SAFETY RISK MANAGEMENT			
Element 2.1 — Hazard identification			
2.1-1	Is there a process for voluntary hazards/threats reporting by all employees? [5.3.42 to 5.3.52; 5.5.4]	☐ Yes ✓ No ☐ Partial	
2.1-2	Is the voluntary hazard/threats reporting simple, available to all personnel involved in safety-related duties and commensurate with the size of the service provider? [5.3.42 to 5.3.52]	☐ Yes ☐ No ☐ Partial N/A	
2.1-3	Does [Organisation] SDCPS include procedures for incident/accident reporting by operational or production personnel? [5.3.42 to 5.3.52; 5.5.4; Chapter 4, Appendix 3]	☐ Yes ☐ No ✓ Partial	Schedule 19 of the BASR provides details of required reporting
2.1-4	Is incident/accident reporting simple, accessible to all personnel involved in safety-related duties and commensurate with the size of the service provider? [5.3.42 to 5.3.52; 5.5.4]	☐ Yes ✓ No ☐ Partial	
2.1-5	Does [Organisation] have procedures for investigation of all reported incident/accidents? [5.3.42 to 5.3.52; 5.5.4]	☐ Yes ✓ No ☐ Partial	
2.1-6	Are there procedures to ensure that hazards/threats identified or uncovered during incident/accident investigation processes are appropriately accounted for and integrated into the organisation's hazard collection and risk mitigation procedure? [2.13.9; 5.3.50 f); 5.5.5]	☐ Yes ✓ No ☐ Partial	
2.1-7	Are there procedures to review hazards/threats from relevant industry reports for follow-up actions or risk evaluation where applicable? [5.3.5.1]	☐ Yes ✓No ☐ Partial	
Element 2.2 — Safety risk assessment and mitigation			
2.2-1	Is there a documented hazard identification and risk mitigation (HIRM) procedure involving the use of objective risk analysis tools? [2.13; 2.14; 5.3.53 to 5.3.61]	☐ Yes ✓ No ☐ Partial	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
2.2-2	Is the risk assessment reports approved by departmental managers or at a higher level where appropriate? [2.15.5; 5.3.53 to 5.3.61]	□ Yes □ No □ Partial N/A	
2.2-3	Is there a procedure for periodic review of existing risk mitigation records? [5.5.4]	□ Yes ✓ No □ Partial	
2.2-4	Is there a procedure to account for mitigation actions whenever unacceptable risk levels are identified? [5.5.4]	□ Yes ✓ No □ Partial	
2.2-5	Is there a procedure to prioritize identified hazards for risk mitigation actions? [5.5.4]	□ Yes ✓ No □ Partial	
2.2-6	Is there a programme for systematic and progressive review of all aviation safety-related operations, processes, facilities and equipment subject to the HIRM process as identified by the organisation? [5.5.4]	□ Yes ✓ No □ Partial	
Component 3 — SAFETY ASSURANCE			
Element 3.1 — Safety performance monitoring and measurement			
3.1-1	Are there identified safety performance indicators for measuring and monitoring the safety performance of the organisation's aviation activities? [5.3.66 to 5.3.73; 5.4.5; 5.5.4; 5.5.5; Appendix 6]	□ Yes ✓ No □ Partial	
3.1-2	Are the safety performance indicators relevant to the organisation's safety policy as well as management's high-level safety objectives/goals? [5.3.66 to 5.3.73; 5.4.5; Appendix 6]	□ Yes □ No □ Partial N/A	
3.1-3	Do the safety performance indicators include alert/target settings to define unacceptable performance regions and planned improvement goals? [5.3.66 to 5.3.73; 5.4.5; 5.5.4; 5.5.5; Appendix 6]	□ Yes □ No □ Partial N/A	
3.1-4	Is the setting of alert levels or out-of-control criteria based on objective safety metrics principles? [5.3.66 to 5.3.73; 5.4.5; Appendix 6]	□ Yes □ No □ Partial N/A	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
3.1-5	Do the safety performance indicators include quantitative monitoring of high-consequence safety outcomes (e.g. accident and serious incident rates) as well as lower-consequence events (e.g. rate of non-compliance, deviations)? [5.3.66 to 5.3.73; 5.4.5; 5.5.4; 5.5.5; Appendix 6]	□ Yes □ No □ Partial N/A	
3.1-6	Are safety performance indicators and their associated performance settings developed in consultation with, and subject to, the civil aviation authority's agreement? [5.3.66 to 5.3.73; 5.4.5.2; 5.5.4; 5.5.5]	□ Yes □ No □ Partial N/A	
3.1-7	Is there a procedure for corrective or follow-up action to be taken when targets are not achieved and alert levels are exceeded/ breached? [5.4.5; Appendix 6, Table 5-A6-5 b)]	□ Yes ✓No □ Partial	
3.1-8	Are the safety performance indicators periodically reviewed? [5.4.5; Appendix 6]	□ Yes □ No □ Partial N/A	
Element 3.2 — The management of change			
3.2-1	Is there a procedure for review of relevant existing aviation safety-related facilities and equipment (including HIRM records) whenever there are pertinent changes to those facilities or equipment? [5.3.74 to 5.3.77; 5.5.4]	□ Yes ✓ No □ Partial	
3.2-2	Is there a procedure for review of relevant existing aviation safety-related operations and processes (including any HIRM records) whenever there are pertinent changes to those operations or processes? [5.3.74 to 5.3.77; 5.5.4]	□ Yes ✓ No □ Partial	
3.2-3	Is there a procedure for review of new aviation safety-related operations and processes for hazards/risks before they are commissioned? [5.5.4]	□ Yes ✓No □ Partial	
3.2-4	Is there a procedure for review of relevant existing facilities, equipment, operations or processes (including HIRM records) whenever there are pertinent changes external to the organisation such as regulatory/industry standards, best practices or technology? [5.5.4]	□ Yes ✓No □ Partial	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
Element 3.3 — Continuous improvement of the SMS			
3.3-1	Is there a procedure for periodic internal audit/assessment of the SMS? [5.3.78 to 5.3.82; 5.5.4; 5.5.5]	☐ Yes ✓ No ☐ Partial	
3.3-2	Is there a current internal SMS audit/assessment plan? [5.3.78 to 5.3.82; 5.5.4; 5.5.5]	☐ Yes ✓ No ☐ Partial	
3.3-3	Does the SMS audit plan include the sampling of completed/existing safety risk assessments? [5.5.5]	☐ Yes ☐ No ☐ Partial N/A	
3.3-4	Does the SMS audit plan include the sampling of safety performance indicators for data currency and their target/alert settings performance? [5.4.5; 5.5.5]	☐ Yes ☐ No ☐ Partial N/A	
3.3-5	Does the SMS audit plan cover the SMS interface with subcontractors or customers where applicable? [5.4.1; 5.5.5]	☐ Yes ☐ No ☐ Partial N/A	
3.3-6	Is there a process for SMS audit/assessment reports to be submitted or highlighted for the accountable manager's attention where appropriate? [5.3.80; 5.5.5]	☐ Yes ✓ No ☐ Partial	
Component 4 — SAFETY PROMOTION			
Element 4.1 — Training and education			
4.1-1	Is there a programme to provide SMS training/familiarization to personnel involved in the implementation or operation of the SMS? [5.3.86 to 5.3.91; 5.5.5]	☐ Yes ✓ No ☐ Partial	
4.1-2	Has the Accountable Executive undergone appropriate SMS familiarization, briefing or training? [5.3.86 to 5.3.91; 5.5.5]	☐ Yes ✓ No ☐ Partial	
4.1-3	Are personnel involved in conducting risk mitigation provided with appropriate risk management training or familiarization? [5.3.86 to 5.3.91; 5.5.5]	☐ Yes ✓ No ☐ Partial	
4.1-4	Is there evidence of organisation-wide SMS education or awareness efforts? [5.3.86 to 5.3.91; 5.5.5]	☐ Yes ✓ No ☐ Partial	

ICAO No. (no prefix)	Aspect to be analysed or question to be answered	Answer	Status of implementation
[CAR} 4.1-5	Is there a process for ensuring that personnel are trained and competent to perform their duties? [CAR 107.03 (d)]	□ Yes ✓ No □ Partial	
Element 4.2 — Safety communication			
4.2-1	Does [Organisation] participate in sharing safety information with relevant external industry product and service providers or organisations, including the relevant aviation regulatory organisations? [5.3.92; 5.3.93; 5.5.5]	□ Yes ✓No □ Partial	
4.2-2	Is there evidence of a safety (SMS) publication, circular or channel for communicating safety (SMS) matters to employees? [5.3.92; 5.3.93; 5.5.5]	□ Yes ✓No □ Partial	
4.2-3	Are [Organisation] SMS manual and related guidance material accessible or disseminated to all relevant personnel? [5.3.92; 5.3.93; 5.5.5]	□ Yes □ No □ Partial N/A	

Appendix D – HSEM Standard

HEALTH, SAFETY & ENVIRONMENT (HSE) MANAGEMENT

An HSE Management (HSEM) Plan is developed to outline measures intended to minimize potential adverse environmental impacts and health and safety hazards. It serves as a guide for the workforce and management personnel in their roles and responsibilities concerning environmental stewardship and Health, Safety & Environment (HSE) management on site. It further provides a framework for monitoring and communication throughout the operation of the airport. The HSE Plan is a dynamic document and as such is subject to revisions required to reflect changes on site.

PURPOSE OF THE HSE PLAN

The HSE Plan is intended to:

- Ensure good maintenance practices to minimize environmental impacts including but not limited to: minimal disturbance to pre-existing natural environment and cultural resources, prevention of pollution, protection of water resources, and waste management;
- Ensure safe work practices to minimize occupational hazards and work place incidents and accidents;
- Define the HSE Plan management protocol including but not limited to: documentation, monitoring, and reporting guidelines, and evaluation procedures;
- Provide pertinent information and training to management and workforce with regard to HSE obligations;
- Ensure site safety and health for workforce, residents, and visitors; and
- Comply with all applicable laws, regulations, standards, and guidelines.

Each section of the HSE Plan is presented with the aim to:

- Identify and summarize all anticipated significant adverse impacts as well as the location of the impact and extent when feasible;
- Describe mitigation measures where applicable, including the type of impact to which they relate and the conditions under which they are required (continuously or in the event of contingencies);
- Describe monitoring where appropriate or necessary for a specific activity or potential impact; and
- Describe training, staff, and chain of command protocols or other procedures taken to minimize, avoid or mitigate for known potential health and safety, and environmental impacts.

HSE Management systems typically include the following eight elements:

1. Management/Administration:
    a. Policy;
    b. Roles; and

   c. Goals and Targets.

2. Hazard ID, Assessment and Control:
   a. Hazard ranking process;
   b. Evaluation of tasks;
   c. Risk documentation control; and
   d. Change management.
3. Orientation and Training:
   a. Training/qualifications documentation;
   b. Annual orientation;
   c. Task-specific training; and
   d. Evaluation of competencies.
4. Planning, Logistics and Emergency Response:
   a. Documented Aerodrome Emergency Plan;
   b. Scheduled drills;
   c. Assessment of HSE risks and first response requirements; and
   d. Training requirements.
5. Inspections and Audits:
   a. Scheduled and documented inspections;
   b. Annual audit process;
   c. Management participation;
   d. Training of auditors and inspectors; and
   e. Corrective actions and process reviews.
6. Incident Response/Investigations:
   a. Reactive and proactive reporting system;
   b. Investigations by trained staff;
   c. Root cause analysis focused on correction and prevention;
   d. Tracking and reporting of statistics;
   e. Sharing of lessons learned from investigations; and
   f. Review of corrective actions and measures.
7. Recognition and Evaluation:
   a. Establish HSE targets with leading and lagging indicators;
   b. Communicate the importance of HSE management at a senior level; and
   c. Establish recognition programme for staff.
8. Culture and Communication:
   a. Provide ongoing HSEM-related communication;
   b. Document HSE discussion in meeting minutes and emails; and
   c. Measure culture through an annual survey to track improvements.

OBJECTIVES OF THE HSE PLAN

Promote aviation safety through the reduction of HSE hazards by implementing techniques to minimize the presence and potential presence of avifauna and feral animals in the airport vicinity, and to ensure HSE hazard prevention measures are in place to protect all personnel on the aerodrome property.

The objectives of the HSE Plan will be attained by completing the following:

1. Risk Identification
    a. Identify Hazards that relate to:
        i. Health & Safety hazards on both the air side and land side, the terminal and associated buildings, and those associated with aircrafts; and
        ii. Land Practices near airport (e.g., Landfills, fish processing, etc.).
    b. Complete Botanical and Avifauna Assessments for each airport to determine habitat types and fauna present:
        i. Create a listing of all fauna surveyed as baseline record, note IUCN status;
        ii. Create a listing of seasonal fluctuations and migratory species; and
        iii. Create a listing and location of preferred fauna habitat in airport vicinity.
    c. Complete a Wildlife Hazard Ranking System (refer to Section 21.415 of Schedule 21 of the BASR). Identify hazardous fauna based on field surveys and level of risk to aircraft, i.e. flamingo vs. bananaquit :
        i. Priority listing of birds for control (Gulls, herons, egrets, ducks, doves, pigeons, rails, coots, sandpipers, and terns); and
        ii. International airports with higher flight frequencies may want to develop a hazard ranking based on bird type, abundance, and/or probability for bird strikes.
2. Risk Management
    a. Proactive Management to include:
        i. The removal of habitat known to attract avifauna and feral animals will likely reduce the frequency of visitations. Reducing the frequency of visitations through habitat control is a proactive method of environmental hazard reduction;
        ii. Coppice Forest;
        iii. Wetlands & Standing water;
        iv. Scrub;
        v. Tall grass;
        vi. Abandoned Buildings;
        vii. Emphasis on proper housekeeping for all facilities;
        viii. Regular inspections; and
        ix. Emphasis on personal protective equipment (PPE).

b. Dispersal/Continuing Animal/Avifauna Control. Relocation of existing animals through humane techniques to a suitable alternative location away from the airport vicinity. Dispersal of fauna by use of scare techniques and acoustic deterrents, prey eradication, trained dogs, or if necessary, lethal methods. Assessment of aerodrome fencing and integrity thereof.

2. Risk Monitoring Program

    a. HSE Reports and Log for local analysis by the aerodrome HSE manager and roll-up to a BCAD system for follow-up as appropriate by the HSE Manager for the Family Islands Airports;
    b. Wildlife Management Log. Create a written record of wildlife at airport. Written record is not to be destroyed. Standard form by CAD;
    c. Wildlife Strike Log. Standard form by CAD; and
    d. File yearly data to BCAD to compile and analyse by the HSE Officer and input of bird strike reports into IBIS.

3. Organisational Capacity

    a. HSE Manager. Identify responsibility for HSE and wildlife controller – this position can be existing within airside operations personnel or possibly a dedicated aerodrome HSE Manager:

        i. Ensures environmental training and HSE accident/incident investigation techniques training;
        ii. Ensures firearm permit is applicable and current as appropriate for wildlife controls;
        iii. Checks runway/airstrip for wildlife hazards, i.e., birds or animals present, bird debris; and
        iv. Maintains Wildlife Management Log for avifauna and animal intrusions/incidents.

    b. HSE Officer - Civil Aviation Department. A position at BCAD in Nassau to facilitate training, data collection and analysis, communication protocol, and HSE obligations of the Family Island Airport with national regulations and policies.

    c. Training. Develop training programme to identify, manage, and reduce HSE hazards

        i. Application of dispersal techniques to prevent habituation of nonthreatening techniques;
        ii. Persistent and diligent application to remove hazard until no longer a threat; and
        iii. Conduct staff training at least once every three years.

4. Communication System

    a. Establish effective communications to keep all staff at aerodromes informed of hazards and reporting commitments

   b. Establish an effective communication system to alert pilots of hazardous wildlife.
   c. Establish methods of communication with BCAD for data reporting and timeframe for reporting, i.e., weekly, monthly, and yearly.

5. Accident Notification Plan

   a. Plan to alert and notify BCAD of significant HSE accidents and wildlife incidents with aircraft in accordance with Schedule 19 and Schedule 21 requirements.

PROPOSED GENERIC HSE POLICY

XXXX Airport is committed to providing and maintaining a healthy and safe workplace and to responsibly manage all of the environmental aspects of its business.

Our core values guide us in all that we do. The way we treat our people, the users of our aerodrome, and our neighbours reflects who we are, what we believe in, and how we do our work. We believe in doing what is right, which includes sending our people home injury-free, every day.

XXXX Airport strives to:

- Identify, assess, and manage the health, safety, and environmental hazards and risks to which its employees are exposed;
- Minimize the environmental aspects and impacts associated with the aerodrome's operations;
- Help its employees develop an awareness and understanding of the health, safety, and environmental issues related to their work;
- Work collaboratively with employees to achieve health, safety, and environmental objectives;
- Comply with legislation, regulations, and appropriate industry standards;
- Monitor and enhance the health, safety and environmental practices through inspections, audits, reviews, investigations, corrective actions, and behaviour-based processes;
- Provide a framework which supports the continual improvement of the system; and
- Foster a culture in which all employees, partners, and contractors share a commitment to health, safety, and the environment.

Everyone working for the Department of Civil Aviation is responsible and accountable for the aerodrome's health, safety, and environmental performance. Management, supervisors, employees, and contractors are expected to understand their roles and responsibilities as outlined by the HSE Programme and to comply with the practices of the Health and Safety Management System.

HSE ASPECTS TO BE MANAGED

There are a number of HSE aspects that are currently considered in regulations and Advisory Circulars promulgated by BCAD. Requirements for some of these can be found in ICAO SARPs and initiatives discussed earlier in this report. A brief outline of the requirements for these is presented below. Proposed guidelines for their management are presented in **Appendix E**.

Emissions

Reference: Advisory Circular AC-12-006 Ground Handling

Section 13 Engine Hazards

A. There is a clear operational need for the running of aircraft engines on ramp areas. The associated safety hazards caused by exhaust blast, vibration, fumes, turning propellers and rotors and the intake suction of jet engines are well recognized.

B. As part of the safety management system, aircraft operators should ensure that rules and procedures for safe engine running on the aerodrome are developed and understood by flight crews and handling staff.

Section 13.1 Blast, Vibration, Noise & Fumes

A. Even at idle power the blast effects, vibration and fumes from all sizes of aircraft engines can be significant. As engine size and power settings are increased, the potential for personal injury and damage increases.

B. The amount of fumes produced is directly related to the engine running time and the power settings used.

C. Engine running on the ramp and adjacent taxiway areas should be limited to the minimum necessary to meet aircraft operating needs.

Section 13.1.5 Fumes and Noise

A. In approving engine running or self-manoeuvring on the ramp the following should be taken into account:

1) The concentration of fumes present in an aerodrome area is in direct relation to the time engines are run, the type of engine and power settings used and the strength and direction of the surface wind;

2) To prevent an unacceptable noise nuisance and build-up of fumes, the running of engines in the direct vicinity of buildings, workplaces and congregations of staff or passengers should not be approved; and

3) Where workplaces, such as cargo-sheds and engineering facilities, have to open directly on to parking gate areas, a specific risk assessment is required to determine how best to operate all facilities safely and without risks to health, in respect of noise and fumes.

B. Aircraft operators should develop policies and procedures to minimize the effects of engine noise, vibration and fumes on the airport's local population.

Noise

References:

ICAO Standard Annex 16, Environmental Protection, Volume 1, Aircraft Noise requires Bahamas issue/validate noise certificate for aircraft in international operation. (AC-05-006)
BASR, Schedule 5.060 (Continuing Airworthiness), Schedule 10.051 (Operations of an Aircraft), Schedule 17.100

Responsibility

1. AC-05-006: BCAD delegated Flight Standards Inspectorate the responsibility and authority for the validation of aircraft noise certificate.

Legislation - Civil Aviation Act Chapter 284

Part IV. Section 10.

1) The Minister may make regulations under section 5 as to the conditions under which noise and vibration may be caused by aircraft on aerodromes or in the vicinity thereof and such regulations may provide that subsection (2) shall apply to any aerodrome as respects which provision as to noise and vibration caused by aircraft is so made.

2) No action shall lie in respect of nuisance by reason only of the noise and vibration caused by aircraft on an aerodrome to which this subsection applies by virtue of subsection (1), so long as the provisions of the regulations mentioned in that subsection are complied with.

Civil Aviation Safety Regulations, Schedule 5 Continuing Airworthiness
Section 5.060: Validation of a Noise Certificate

(a) The Authority shall validate the State of Design Noise Certificate for the aircraft at the issuance of a Certificate of Airworthiness.
(b) Such validation may be confirmed by the Authority through issuance of:
(1) A notation of the validation on the Certificate of Airworthiness; or
(2) A separate Noise Certificate conforming to the contents required by ICAO Annex 16.
(c) The confirming document or notation shall be issued in the English language.

Civil Aviation Safety Regulations, Schedule 10 Continuing Airworthiness
Section 10.051: ADDITIONAL DOCUMENTS APPLICABLE TO INTERNATIONAL FLIGHTS

(a) No person may operate a civil aircraft for flights across international borders unless it has within it the additional documents necessary for such flights, including—
(1) A general declaration for customs;

(2) List of passenger names and points of embarkation and destination, if applicable;
(3) Filed ATC flight plan;
(4) Aircraft journey log (or equivalent document);
(5) An aircraft radio licence;
(6) The procedures and signals relation to interception of aircraft;
(7) An English translation of the ***aircraft noise certificate*** (or equivalent document); and
(8) Any other documentation that may be required by the Authority or States concerned with a proposed flight.

Civil Aviation Safety Regulations, Schedule 10 Continuing Airworthiness
Section 10.487: Noise Abatement

(a) No person may take-off an aircraft at an aerodrome where a noise abatement departure is applicable to the aircraft without following those procedures, unless this action would not be considered safe or practical considering the existing conditions or performance limitations.
(b) Unless otherwise required by special circumstances at an aerodrome, each person shall use, any one aircraft type, the same noise abatement procedure and profiles at all aerodromes.
(c) No person may take-off or land an aircraft at a mass that exceeds the maximum demonstrated for that aircraft to comply with the noise certification standards, unless authorised by the competent authority of the State for a specific aerodrome or runway where there is no noise disturbance problem.
(d) The operator of a helicopter should ensure that take-off and landing procedures take into account the need to minimize the effect of helicopter noise.

Civil Aviation Safety Regulations, Schedule 17 Mass & Balance & Performance
Section 17.100 MASS LIMITATIONS

(e) In no case shall the mass at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum masses at which compliance has been demonstrated with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorised by competent authority of the State—

(1) In exceptional circumstances for a certain aerodrome; or
(2) On a runway where there is no noise disturbance problem.

Advisory Circular AC-05-006 Validation of Aircraft Noise Certificate
(Flight Standards Inspectorate) Date 28th March 2012

Purpose: The Advisory Circular provides guidance to operators and aircraft owners when applying for validation of aircraft noise certificates. Circular describes process to apply, standards, and certificate process.

*Authority requires 10 working days to review application and issue new noise certificate to all qualifying aircraft (FSI Form 300 when applying)

Advisory Circular AC-12-006 Ground Handling
Section 13.1.5 Fumes and Noise (Section 13 Engine Hazards)

A. In approving engine running or self-manoeuvring on the ramp the following should be taken into account—

1) The concentration of fumes present in an aerodrome area is in direct relation to the time engines are run, the type of engine and power settings used and the strength and direction of the surface wind;

2) To prevent an unacceptable noise nuisance and build-up of fumes, the running of engines in the direct vicinity of buildings, workplaces and congregations of staff or passengers should not be approved;

3) Where workplaces, such as cargo-sheds and engineering facilities, have to open directly on to parking gate areas, a specific risk assessment is required to determine how best to operate all facilities safely and without risks to health, in respect of noise and fumes.

B. Aircraft operators should develop policies and procedures to minimize the effects of engine noise, vibration and fumes on their local population.

Fuelling

Reference: AC-12-006 Acceptable Ground Handling Arrangements

Section 1.7 DEFINITIONS & ACRONYMS

A. The following definitions are used in this advisory circular—

1) Fuelling. This term includes both fuelling and defueling.

2) Fuelling Areas. The fuelling of aircraft at an aerodrome should normally be carried out in the open air and should only be carried out in areas approved by the aerodrome authority. As a general guide, fuelling areas should be sited to avoid bringing fuelling equipment or aircraft fuel tank vents to within 15 meters of any building other than those parts constructed for the purpose of direct loading or unloading of aircraft, such as nose loaders, loading bridges etc.

3) Fuelling Zone. The fuelling zone should be regarded as extending not less than six meters radially from the filling and venting points on the aircraft and the fuelling equipment and, when applicable, from the hydrant valve in use for the fuelling. When defueling is taking place, the vehicle will be venting and will generate a fuelling zone radiating from the tank vent.

AC-12-006 Ground Handling Section 8.6.2 Fuel Spills does not identify procedures for spill clean-up. It only refers to aerodrome fire service and comply with laid down aerodrome procedures. AEPs (separate cover) are to include fuel spills response.

Section 3.3 Integrating Service Providers into the Process

A fuelling service provider ensures proper grounding of aircraft, correct type of fuel, fuel upload, fuelling and securing the fuel caps and closing of any panels.

Section 8 Fuelling Procedures

8.6.2 Fuel Spills

A. In the event of a fuel spill, action should be taken immediately to stop the fuel flow and ensure that the pilot in command/crew is informed.

B. The following action may be appropriate although each spill will need to be treated as an individual case because of such variables as the size and location of spill, type of fuel involved, prevailing weather conditions, etc.

C. In the case of a spill occurring which measures more than two meters in diameter the fuelling supervisor, flight crew, maintenance representative or fuel maintenance representative should—

1) Consider evacuation of the area. It is generally safer upwind and upslope of any fuel spill;

2) Notify the aerodrome fire service and comply with laid down aerodrome procedures;

3) Prevent the movement of persons or vehicles into the affected area and ensure that all activities in the vicinity are restricted to reduce the risk of ignition; and

4) Ensure that engines of vehicles within six meters of a spill are not started until the area is declared safe.

Civil Aviation Safety Regulations, Schedule 21 Aerodrome Standards & Certification

Section 21.380 Aerodrome Emergency Plan

(h) The aerodrome emergency plan shall—

(1) Include the types of emergencies planned for and identify the potential emergencies, including—

(iii) A fuel spill that spreads at least 1.5 metres in any direction or exceeds 12 mm in depth;

Waste Management & Spills

Reference: Civil Aviation Safety Regulations, Schedule 21 Aerodrome Certification and Operation

Section 21.455: Prohibitions in Certified Aerodromes

(c) No person shall, on a certified aerodrome—

(1) Obstruct or interfere with the authorised use of the aerodrome;
(2) Obstruct any employee of the aerodrome operator acting in the execution of his or her duty in relation to the aerodrome;

(3) Throw, leave, or drop anything capable of causing injury to any person or damage to property;
(4) Dump any waste matter whatsoever elsewhere other than a place designated and approved for the purpose by the aerodrome operator;
(5) Commit any nuisance, disorderly or indecent act, write, draw or affix any profane, obscene or abusive materials on an aerodrome;
(6) Spill or release substances capable of causing air, water, or soil pollution.

Appendix E – Environmental Guidelines

WASTEWATER AND STORMWATER MANAGEMENT GUIDELINE

1. SCOPE AND APPLICABILITY

This Guideline applies to airport operations, projects and activities which have the potential to generate contaminated stormwater and/or wastewater, including domestic and industrial wastewater discharges.

2. DEFINITIONS

Liquid Waste: means

a) Sewerage and human body wastes and other organic wastes and waste water from toilets and other receptacles intended to receive body wastes;
b) Drainage from medical premises e.g. hospitals, sick bays, dispensaries via baths, wash basins and the like fixtures;
c) Drainage from places where animals are held, reared or slaughtered;
d) Drainage and waste water from domestic, industrial, commercial and agricultural operations including the manufacture and storage of chemicals; and
e) Other waste waters.

Domestic wastewater: (also referred to as sanitary wastewater) may include effluents from domestic sewage, food service and laundry facilities serving site employees.

Industrial wastewater: refers to wastewater generated from industrial operations, including process wastewater, runoff from process and materials storage areas, and miscellaneous activities including wastewater from equipment maintenance shops, etc.

Stormwater: means runoff generated, typically through rainfall.

3. SHORT TERM GOALS

- Identify location of wastewater discharges from the property (i.e. sanitary, septic, overland or storm runoff, sea, etc.) in order to understand operations/activities that have direct or indirect discharge of untreated wastewater to the environment, and those that discharge to sewage or septic systems with some treatment provided;
- Ensure that wastewater is not discharged into any stormwater drain or surface water body, and that stormwater is prevented from entering into any sanitary sewer;
- Minimize outdoor storage of materials so as to prevent generation of contaminated stormwater as much as possible. Ensure that any spills are cleaned up and contamination remediated as soon as possible;
- Ensure that wastewater which is discharged into a sewerage system does not contain matter which is injurious to the system, or any steam or hot water at a temperature exceeding 65C/150F;
- Ensure that any on-site treatment/retention facilities for wastewater are maintained so as to prevent any impact to the environment or health hazard; and

- Implement measures where practicable to minimize wastewater/stormwater runoff generated from the site. Refer to Guidelines related to Water Conservation, so as to minimize generation of wastewater wherever possible (i.e. implementation of rainwater harvesting practices also has benefits related to minimization of stormwater generation).

4. LONGER TERM GOALS

- Establish a sampling and monitoring programme for site wastewater discharges where contaminants/pollutants of concern are suspected to be present. Ensure monitoring locations are selected with the objective of providing representative monitoring data;
- Assess compliance of wastewater discharges with applicable sewer discharge standards (if the wastewater is discharged to a surface water or sewer), and water quality standard for a specific reuse (e.g. if the wastewater is reused for irrigation). Consider local standards for wastewater discharge to treatment systems, where applicable;
- Ensure that changes to operations/activities are evaluated to determine any resulting change to wastewater discharges, in order to minimize impact to the environment; and
- Ensure that oil water separators and grease traps are installed and maintained at fuelling and fuel storage areas, workshops, and parking areas where there is potential for spills of petroleum products.

5. REFERENCES

- International Finance Corporation – Wastewater and Ambient Water Quality Guideline
- Bahamas Water and Sewerage Corporation Act, 1976
- Bahamas Environmental Health Services Act
- Bahamas Civil Aviation (Safety) Regulation, Schedule 21
- ICAO Airport Planning Manual Part 2 - Land Use and Environmental Control
- Canadian Wastewater Systems Effluent Regulations SOR/2012-942
- US EPA National Recommended Water Quality Criteria

NATURAL ENVIRONMENT PROTECTION GUIDELINE

1. SCOPE AND APPLICABILITY

This Guideline applies to expansion/development and ground operations activities conducted at the Family Islands Airports. Aircraft operations in relation to natural environment protection, specifically related to wildlife and spills, is addressed under the Family Islands Airports requirements supporting an effective Safety Management System (SMS) as detailed in Schedule 21 of the Bahamas Civil Aviation (Safety) Regulation (BASR). Response and Remediation activities from spills or releases are covered under the Emergency Preparedness and Response Plan prepared for the Family Islands Airports.

2. DEFINITIONS

Environmental Impact Assessment (EIA): is a process used to predict the anticipated effects (positive or negative) of a proposed project or development on the environment. The BEST Commission provides guidelines for Environment Impact Assessments (EIA) and Environment Management Plans (EMP) for Industrial, Commercial and Residential developments throughout the Bahamas' archipelago.

3. SHORT TERM GOALS

- Develop a listing of wildlife, birds, flora and other fauna present in the vicinity of the airport, specifically: birds protected under the Wild Birds Protection Act (Chapter 249); endangered species of flora/fauna as listed in Wildlife Conservation & Trade Chapter 250A; or protected tree species listed within the Conservation and Preservation of the Physical Landscape Act;
- Survey the airport and surrounding area to identify sources of food, water and shelter attractive to wildlife on and in the vicinity of the airport, in order to understand specific conditions or habitats that may attract wildlife;
- Conduct Phase I Environmental Site Assessments at airport properties to identify any potential for environmental contamination and understand potential environmental concerns. Priority is on those airports slated to be divested, transferred or closed; and
- Conduct an Environmental Impact Assessment (EIA) prior to construction/expansion of an airport facility, to ensure that environmental factors are considered in the development of a new airport or the expansion of an existing one, including studies related to the impact of the construction/operation/expansion upon acceptable levels of air and water quality, noise levels, ecological processes; and demographic development of the area must be conducted to determine how the airport requirements can be best accommodated. Other factors to be considered include: air and water pollution, industrial wastes and domestic sewage originating at the airport and the disturbance of natural environmental values. The study must indicate how disruptions to the environment might be alleviated. (Note: ICAO Airport Planning

Manual Part 2 – Land Use and Environmental Control includes all information that should be included in an EIA.).

4. LONGER TERM GOALS

- Ensure that an environmental impact assessment (EIA) is conducted for development and changes in land use activities at Family Islands Airports. Ensure that requirements from ICAO Airport Planning Manual Part 2 - Land Use and Environmental Control are included in the EIA;
- Ensure that mitigating measures identified in EIAs are implemented to reduce environmental impacts;
- Ensure that development and operational activities do not harm or displace birds protected under the Wild Birds Protection Act (Chapter 249); endangered species of flora/fauna as listed in Wildlife Conservation & Trade Chapter 250A; or protected tree species listed within the Conservation and Preservation of the Physical Landscape Act. However, it is important to also ensure that the presence of wildlife in aircraft flight paths is managed through habitat management activities;
- Land use planning in the vicinity of an airport should both:
    - Provide for airport needs (obstacle limitation areas and future airport development); and
    - Ensure minimal interference to the environment and the public (e.g. by locating residential areas away from zones subject to excessive noise).
- When undertaking planning activities related to airport development or expansion, ensure that locations of wildlife reserves and migratory areas are noted, as well as any noise-sensitive areas such as schools or hospitals in the area; and
- Refer to SMS requirements related to development and implementation of a Wildlife Control Programme as well as a Bird/Wildlife Strike Control Programme.

5. REFERENCES

- ICAO Airport Planning Manual Part 2 – Land Use and Environmental Control
- ICAO Airport Services Manual Part 3 - Bird Control and Reduction
- ICAO Airport Services Manual Part 8: Airport Operational Services
- Wild Birds Protection Act (Chapter 249)
- Wildlife Conservation & Trade Chapter 250A
- Conservation and Preservation of the Physical Landscape Act
- Bahamas Civil Aviation (Safety) Regulation, Schedule 21

AIR EMISSIONS AND NOISE MANAGEMENT GUIDELINE

1. SCOPE AND APPLICABILITY

This Guideline applies to emission of contaminants to air, including noise emissions, from airport ground operations and projects. Although this Guideline was not specifically developed to address emissions from aircraft, certain principles may be applied to aircraft so that passenger safety is not compromised. Local airport staff should work with aircraft operators to determine how the principles of this Guideline may be applied to air and noise emission from aircraft while on the ground at the Family Islands Airports and also to ensure compliance with Schedules 10 and 17 of the BASR.

Four principal elements are offered for consideration related to noise management, as directed by ICAO and referenced in Schedules 10 and 17 of the BASR:

- Reduction of noise at source;
- Land-use planning and management;
- Noise abatement operational procedures; and
- Operating restrictions on aircraft.

These principals should be incorporated into short term and long term goals adopted at airport facilities.

2. DEFINITIONS

Contaminant or Pollutant: means any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities which may:

i. Impair the quality of the natural environment for any use that can be made of it;
ii. Cause injury or damage to property or to plant or animal life;
iii. Cause harm or material discomfort to any person;
iv. Adversely affect the health or impair the safety of any person; or
v. Render any property or plant or animal life unfit for use by humans.

Contamination: means the state resulting from the presence of a contaminant.

Emission: means the act of passing into the air, water or on land a contaminant or gas stream, visible or invisible.

Environment: means the natural, man-made or altered environment of air, land and water (including the coastal waters of the sea) or any combination or part thereof.

3. SHORT TERM GOALS

- Ensure that a certificate of approval is in place for the operation, construction, alteration, extension or replacement of any structure, equipment, apparatus or thing

that may emit or discharge, or from which may be emitted or discharged, a contaminant or pollutant into any part of the environment;
- Promote reduction of engine idling of ground vehicles wherever possible;
- Practice "good driving" for vehicles (reduce driving distance, accelerate smoothly, driving optimal speeds, selection of vehicles, etc.);
- Work with aircraft operators to limit aircraft engine running on the ramp and adjacent taxiway areas to the minimum. Encourage early shut-down of one or more engines after landing (may increase noise);
- Work with aircraft operators to minimize the running of engines in the direct vicinity of buildings, workplaces and staff or passenger areas;
- Promote operational towing to delay start-up of aircraft engines where possible; and
- Ensure that leaks of CFCs related to air conditioning/refrigeration equipment are minimized and that unwanted CFCs are disposed of responsibly.

4. LONGER TERM GOALS

- Work towards the replacement of CFC-based air conditioning/refrigeration equipment;
- Consider retrofitting/replacement of gas/diesel engines to reduce noise emissions;
- Conduct a site-specific risk assessment to determine how to operate facilities in the interest of minimizing risks to health from noise and emission of other air contaminants; and
- Implement the use of acoustical barriers (protective gear coverings, soundproofing buildings and/or other methods of screening sound) at airports.

5. REFERENCES

- International Finance Corporation – Air Emissions and Ambient Air Quality Guideline
- Bahamas Environmental Health Services Act
- ICAO Airport Planning Manual Part 2 - Land Use and Environmental Control
- Bahamas Civil Aviation (Safety) Regulation Schedule 10 and Schedule 17

WASTE MANAGEMENT GUIDELINE

1. SCOPE AND APPLICABILITY

This Guideline applies to airport operations and projects which generate, store or otherwise handle wastes, including domestic non-hazardous, hazardous, and construction/demolition wastes.

2. DEFINITIONS

Domestic Waste: means ashes, garbage, refuse, rubbish, and yard waste generated from the operation of any single-family residential development, multiple-family residential development, commercial or institutional establishment, if the total amount of waste is less than 12 cubic feet per regularly scheduled pick up, and is properly placed in a domestic waste receptacle, but does not include bulky waste, construction and demolition waste, abandoned vehicles or abandoned appliances, medical waste, special waste or street waste.

Industrial Waste: means the discarded material and waste products of any industry, trade or manufacturer, and include but is not limited to food processing wastes, lumber scraps, metal scraps, and shavings. Industrial waste does not include medical waste or special waste.

Hazardous Waste: Shares the properties of a hazardous material (e.g. ignitability, corrosivity, reactivity, or toxicity), or other physical, chemical, or biological characteristics that may pose a potential risk to human health or the environment if improperly managed (i.e. spent solvents and oily rags, empty paint cans, chemical containers; used lubricating oil; used batteries (such as nickel-cadmium or lead acid); and lighting equipment, such as lamps or lamp ballasts.

Litter: means anything whatsoever, including dust, dirt, oddments, leavings, waste paper, cigarette ends, bottles (whether empty or not), derelict vehicles, derelict vessels and any dead animal or carrion.

Solid Waste: includes ashes, garbage, refuse, litter and other discarded solid material resulting from domestic, industrial, commercial and agricultural operations and from community activities but does not include sewage. (Non-hazardous waste) Examples of such waste include domestic trash and garbage; inert construction/demolition materials; refuse, such as metal scrap and empty containers (except those previously used to contain hazardous materials which should be managed as a hazardous waste).

Special Waste: means waste that requires special or extraordinary management to maximize the protection of human health and the environment, including, but not limited to hazardous waste, sewage sludge, auto hulks, tires, aerosol containers, animal blood, grease trap pumping and skimming, lead acid batteries, septage, imported waste, used lubrication oil and medical waste.

3. SHORT TERM GOALS

- Definition of procedures and operational controls for on-site storage, so as to prevent or control accidental releases to the environment (i.e. in closed containers, storage of wastes indoors where practicable, storage within spill containment, etc.). Ensure waste containers are labelled to indicate contents;
- Periodically inspect wastes in storage for signs of leaks, and to ensure containers remain in good condition;
- Develop a waste management plan, which includes preventing or minimizing the generation waste materials, as far as practicable. Consider:
    - Substitution (use of less hazardous or toxic materials);
    - Use of good housekeeping and operating practices including inventory control to reducing waste generation from out-of-date, contaminated or damaged materials;
    - Investigate opportunities to return containers to suppliers, and prevent over-ordering of materials; and
    - Minimizing hazardous waste generation by ensuring effective waste segregation practices, to prevent the commingling of non-hazardous and hazardous waste to be managed.
- Re-use / recovery as an alternative to disposal (including construction waste, asphalt, concrete, etc.);
- Where prevention or re-use / recovery of waste is not possible, ensuring disposal is conducted in an environmentally sound manner, in accordance with Department of Environmental Health Services requirements. (i.e. special waste shall be disposed of at a waste management facility holding a certificate of approval, and in accordance with regulations which specifically address the disposal of special waste; international waste shall be segregated at the source, transported separately to landfill, and disposed of within a designated area per instructions from the Department of Environmental Health Services); and
- Provide training to employees in order to meet objectives.

4. LONGER TERM GOALS

- Collection of data and information about waste streams that are generated, including characterization of waste streams by type, quantities, and potential use/disposition;
- Investigation of alternative disposal methods / increase of recycling of materials;
- Investigation of external markets for recycling;
- Consider composting of organic wastes; and
- Opt for "green" products where possible.

5. REFERENCES

- International Finance Corporation – Waste Management Guideline
- Bahamas Environmental Health Services Act

- Bahamas Environmental Health Services (Collection and Disposal of Waste) Regulations, 2004
- ICAO Airport Planning Manual Part 2 - Land Use and Environmental Control

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