

Document	BAR 10 Aeronautical Telecommunications	
Version	1.0	



**Brunei Department of Civil Aviation**

**Negara Brunei Darussalam**

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# **Brunei Aviation Requirements**

## **BAR 10**

### **Aeronautical Telecommunications**

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## AMENDMENT RECORDS

### Amendments

No.	Amendment	Version	Date of Issue	Remarks
1	Incorporating latest ICAO Annex 10 amendments:  Amendment 91 of Annex 10 Volume I Amendment 91 of Annex 10 Volume II Amendment 90 of Annex 10 Volume IV	Version 1.0	29 January 2020	

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## DEFINITIONS AND ABBREVIATIONS

### **Definitions**

#### **Air Navigation Services (ANS)**

Services provided to air traffic during all phases of operations including Air Traffic Management (ATM), Communication, Navigation and Surveillance (CNS), Meteorological Services for air navigation (MET), Search and Rescue (SAR) and Aeronautical Information Services (AIS).

#### **Aeronautical Information Publication (AIP)**

A publication issued by and with the authority of the State and containing aeronautical information of a lasting character essential to air navigation.

#### **Aeronautical Information Service (AIS)**

A service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

#### **Aeronautical telecommunication service**

Provision of any communication, navigation and surveillance service for any aeronautical purpose, including any system that processes or displays air traffic control data.

#### **Air Traffic Safety Electronic Personnel (ATSEP)**

Personnel engaged in the installation, operation or maintenance of a Communication, Navigation, Surveillance or Air Traffic Management (CNS/ATM) system and includes the personnel of a contractor.

#### **Facility**

Equipment, building or service that support an aeronautical telecommunication service.

#### **Malfunction incident**

Incident related to the malfunction or failure of a facility.

#### **Maintenance contractor**

An organisation contracted by the air navigation service provider to operate and maintain its facility on its behalf.

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### **Notice to Airmen (NOTAM)**

A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service or procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

### **Safety case**

A process that documents the evidence and argument that a facility or change to a facility meets the safety objectives or levels for the facility.

### **Safety incident**

Any incident involving a hazard to the provision of aeronautical telecommunications facility which may or may not result in a service malfunction. Examples of safety incidents include: - a fire or explosion at a facility - hazards in the facility maintenance process such as human error which may have safety implications - security breaches at a facility which may have safety implications.

### **Serious service failure**

Loss of aeronautical telecommunication service which breaches the established safety performance targets.

### **System performance target**

A set of performance targets for each facility which an air navigation service provider sets out to achieve as spelt out in its operations manual.

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## **Abbreviations**

<b>ANS</b>	Air Navigation Service
<b>ADS-B</b>	Automatic Dependent Surveillance-Broadcast
<b>AIP</b>	Aeronautical Information Publication
<b>ATC</b>	Air Traffic Control
<b>ATSEP</b>	Air Traffic Safety Electronic Personnel
<b>AIC</b>	Aeronautical Information Circular
<b>ATS</b>	Air Traffic Service
<b>ATM</b>	Air Traffic Management
<b>ICAO</b>	International Civil Aviation Organisation
<b>VCCS</b>	Voice Communication Control System
<b>ILS</b>	Instrument Landing System
<b>SMS</b>	Safety Management System

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## **PART A PREFACE**

### **A.1 Introduction**

Pursuant to Civil Aviation Order 2006 (CAO 2006) and the Civil Aviation Regulations 2006 (CAR 2006) and their subsequent Amendments, the following requirements are hereby established for compliance by aeronautical telecommunications provider, the Director of Civil Aviation is empowered to issue *Brunei Aviation Requirements (BARs)*. In accordance herewith, the following requirements are hereby established for compliance by Aeronautical Telecommunications provider. These requirements shall be known as *BAR 10 - Aeronautical Telecommunications* and any reference to this title shall mean referring to the requirements to be met for the provision of aeronautical telecommunications service in Brunei Darussalam.

Any Aeronautical Telecommunications provider who contravenes any provision in these Requirements is guilty of an offence and liable on conviction under Part X of the CAO 2006 and Regulation 87 of the CAR 2006.

### **A.2 Authority for this Requirements**

This BAR 10 - Aeronautical Telecommunications is issued under the authority of the Director of Civil Aviation.

### **A.3 Applicability**

This BAR 10 - Aeronautical Telecommunications is applicable to any aeronautical telecommunications provider involved in the provision of aeronautical telecommunications service in Brunei Darussalam.

### **A.4 Scope**

This BAR 10 - Aeronautical Telecommunications contains the requirements for the provision of aeronautical telecommunications service in Brunei Darussalam which are in compliance with *ICAO Annex 10*.



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## **PART B ANS SAFETY OVERSIGHT REQUIREMENTS**

### **B.1 Competent Authority for Safety Oversight**

For the purpose of this requirement the competent authority for safety oversight of aeronautical telecommunications provider in Brunei Darussalam shall be the ANS Standards Section, Regulatory Division, Brunei DCA. Seven fields of Air Navigation Services (ANS) are:

1. Air Traffic Management (ATM),
2. Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS),
3. Aeronautical Information Services (AIS),
4. Aeronautical Charts (Chart),
5. Communications, Navigation and Surveillance (CNS),
6. Aeronautical Meteorology (MET), and
7. Search and Rescue (SAR).

### **B.2 Safety Oversight Function**

The ANS Standards Section, Regulatory Division, Brunei DCA shall exercise safety oversight as part of their supervision of requirements applicable to aeronautical telecommunications service in order to ensure the safe provision of this activity and to verify that the applicable safety regulatory requirements and their implementing arrangements are met by aeronautical telecommunications provider.

### **B.3 Safety Regulatory Audits**

- 1) Within the ANS surveillance programme, the ANS Standard Section, Regulatory Division, Brunei DCA shall establish a programme of safety regulatory audits in order to:
  - a) cover all ANS providers;
  - b) ensure that sufficient audits are conducted over a period of 2 years for compliance by all ANS providers with the established regulatory requirements; and
  - c) ensure follow up of the implementation of corrective action plans (CAPs).
- 2) In addition to scheduled audits, the ANS Standard Section, Regulatory Division, Brunei DCA shall conduct random inspection for which no prior notification is given to the ANS provider, whenever the need arises.

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- 3) All audits and/or inspections shall be documented. Findings (non-compliance) shall be given to ANS provider in the event that sufficient evidence is not presented to ANS inspector.
- 4) An audit / inspection report shall be prepared and given to ANS provider in accordance with established audits / inspection procedures.

#### **B.4 Corrective Action Plans (CAPs)**

- 1) The ANS Standards Section, Regulatory Division, Brunei DCA shall communicate the audit / inspection findings to the audited ANS provider, and shall request CAPs to address the deficiencies.
- 2) Audited ANS provider shall provide CAPs detailing the proposed actions, action office and estimated implementation date.
- 3) The ANS Standards Section, Regulatory Division, Brunei DCA shall assess the CAPs to determine whether the audited ANS provider has sufficiently addressed the identified deficiencies.
- 4) A subsequent follow up audit shall be conducted within a time period determined by the ANS Standards Section, Regulatory Division, Brunei DCA.

#### **B.5 Qualified Entities**

- 1) When the ANS Standards Section, Regulatory Division, Brunei DCA decides to delegate to a qualified entity the conduct of safety regulatory audits, it shall ensure that the criteria used to select an entity amongst those qualified include the followings:
  - i. the qualified entity has prior experience in assessing ANS provider;
  - ii. the qualified entity is not simultaneously involved in the provision of ANS in the same field; and
  - iii. all personnel concerned with the conduct of safety regulatory audits are suitably trained and qualified in accordance with established minimum requirements and experience as determined by Director of Civil Aviation.
- 2) The ANS Standards Section, Regulatory Division, Brunei DCA shall maintain a record of the qualified entities commissioned to conduct on their behalf.

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## **B.6 Safety Oversight Capabilities**

Head of the ANS Standards Section, Regulatory Division, Brunei DCA shall ensure that all ANS inspectors are competent to perform the required function. In this regard the following shall be specified for all ANS inspectors (ATS, AIS, PANS-OPS, MET, CHART, CNS and SAR):

- i. Function and Responsibilities
- ii. Job Description
- iii. Minimum Qualifications and Experience
- iv. Methodology to determine the No. of Inspectors
- v. Training Programme (Initial, OJT, Recurrent and Specialised)
- vi. Periodic Training Plan
- vii. Proper Implementation of Training Plan
- viii. OJT Process
- ix. Maintenance of Training Records

## **B.7 Safety Oversight Records**

The ANS Standards Section, Regulatory Division, Brunei DCA shall keep and maintain access to the appropriate records related to their safety oversight processes, including the reports of all safety regulatory audits and other safety-related records, for a period of 5 years.

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## PART C REQUIREMENTS FOR THE PROVISION OF AERONAUTICAL TELECOMMUNICATIONS

### Chapter 1 Introduction

- 1.1 This *BAR10 – Aeronautical Telecommunications* contains the standards, requirements and procedures pertaining to the planning, operation and maintenance of aeronautical telecommunication facilities by the air navigation service provider.
- 1.2 The standards in this BAR are based on those stipulated in *Annex 10 - Aeronautical Telecommunications* to the Convention on International Civil Aviation [as in force and amended from time to time by the Council of the International Civil Aviation Organisation (ICAO)] and other relevant ICAO documents, and with such modifications as may be determined by ANS Standards Section, Regulatory Division to be applicable in Brunei Darussalam.
- 1.3 This BAR is based mainly on compliance with the following ICAO documents:
- (a) ICAO Annex 10 Volumes I to V – Aeronautical Telecommunications;
  - (b) ICAO Annex 11 – Air Traffic Service;
  - (c) ICAO Annex 19 – Safety Management;
  - (d) ICAO Doc 8071 Volumes I to III – Testing of Ground-based and Satellite-based Radio Navigation Systems and Surveillance Radar Systems;
  - (e) ICAO Doc 9859 – Safety Management Manual;
  - (f) ICAO Doc 4444 – Procedures for Air Navigation Service;
  - (g) ICAO Doc 9868 - PANS-Training; and
  - (h) ICAO Doc 10057 – ATSEP Training manual.
- 1.4 An aeronautical telecommunications provider shall ensure that the aeronautical telecommunication service that it provides is in conformity with the provisions in this BAR.
- 1.5 An aeronautical telecommunications provider shall be able to demonstrate that their working methods and operating procedures are compliant with the standards in Annex 10 to the Convention on International Civil Aviation as far

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as they are relevant for the provision of aeronautical telecommunications service in the airspace concerned:

- (a) Volume I on radio navigation aids;
- (b) Volume II on communication procedures;
- (c) Volume III on communication systems;
- (d) Volume IV on surveillance radar and collision avoidance systems; and
- (e) Volume V on aeronautical radio frequency spectrum.

1.6 The aeronautical telecommunications provider shall ensure that technical personnel including personnel of subcontracted operating organisations who operate and maintain aeronautical telecommunications facilities approved for their operational use have and maintain sufficient knowledge and understanding of the service they are supporting, of the actual and potential effects of their work on the safety of those service, and of the appropriate working limits to be applied.

1.7 An aeronautical telecommunications provider shall ensure that technical personnel are adequately trained and competent for the job they are required to do (competency).

1.8 Where there is a difference between a standard in this BAR and that of the above-mentioned ICAO documents, the standard in this BAR shall prevail.

1.9 Differences, where they exist, between the standards in this BAR and those contained in the ICAO Annexes shall be published in the Brunei AIP and also notified to ICAO.

1.10 The aeronautical telecommunications provider shall ensure that the units of measurement as specified in the *BAR 5 – Units of Measurement* to be used in Air and Ground Operations are used for the provision of aeronautical telecommunication service.

1.11 In addition to the BAR, the following may also be issued as and when required to supplement the BAR:

- (a) Safety Directive – this is a mandatory requirement to be complied by the aeronautical telecommunications provider. It is published for purposes of immediate promulgation of local standards and recommended practices

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in response to, but not limited to, amendments to ICAO Annexes. The Safety Directives will be incorporated into subsequent amendments of the BAR.

- (b) Safety Publication – this is published for purposes of promulgating supplementary guidance materials to the standards and recommended practices in the BAR. The publications are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means, of complying with the BAR. Safety Publications may explain certain regulatory requirements by providing interpretive and explanatory materials.
- (c) Information Circular – this is published for purposes of bringing to the attention of the aeronautical telecommunications provider educational materials related to aviation safety. The publications could be initiated as a result of ICAO State letters which do not require immediate changes to local regulations, new safety initiatives or international best practices as identified by ANS Standard Section, Regulatory Division. The aeronautical telecommunications provider is encouraged to review and adopt the material if practicable. Where appropriate, the material in the publications may be incorporated into subsequent amendments of the BAR.

1.10 When an aeronautical telecommunications provider is not able to comply with any standards specified or referenced in this BAR, the aeronautical telecommunications provider shall apply to ANS Standards Section, Regulatory Division for exemption or deviation from the relevant standards. Applications shall be supported in writing with the reasons for such exemption or deviation including any safety assessment or other studies undertaken, and where appropriate, an indication of when compliance with the current standards can be expected.

1.11 Any exemption or deviation granted to an aeronautical telecommunications provider shall also be recorded in the operations manual. The operations manual shall also contain the details of the exemption or deviation, such as the reason that the exemption or deviation was requested and any resultant limitations or conditions imposed.

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## Chapter 2 Operations Manual

### 2.1 Operations Manual

- 2.1.1 The aeronautical telecommunications provider shall develop an operations manual which shall serve to demonstrate how the aeronautical telecommunications provider will comply with the requirements of the BAR. It also serves as a reference document agreed between the aeronautical telecommunications provider and Regulatory Division with respect to the standards, conditions and level of service to be maintained for the aeronautical telecommunication service.
- 2.1.2 The contents of the operations manual shall contain:
- (a) the information required of the aeronautical telecommunications provider as mentioned in this Manual;
  - (b) an organization chart of the aeronautical telecommunications provider and its maintenance contractors, if any, that shows the position of each personnel and the name, qualification, experience, duties and responsibilities of personnel who are responsible for ensuring the compliance of the organization with the requirements in sub-paragraph (a);
  - (c) an overall operation and maintenance plan for the aeronautical telecommunication service, and for each facility, an operation and maintenance plan, as described in Chapter 6 of this Manual;
  - (d) for each facility, information on the compliance of the facility with the applicable requirements of ICAO Annex 10; and
  - (e) the system performance target of each facility, such as its availability and reliability.
- 2.1.3 The operations manual may consist of a main manual covering the main areas that need to be addressed, as well as separate supporting documents and manuals (such as the operation and maintenance plan of each facility) that are referred to in the main manual.
- 2.1.4 The operations manual is an important document and shall be issued under the authority of the aeronautical telecommunications provider. The aeronautical telecommunications provider shall control the distribution of the operations

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manual and ensure that it is amended whenever necessary to maintain the accuracy of the information in the operations manual and to keep its contents up to date.

2.15 Aeronautical telecommunications provider shall provide and keep up-to-date operations manuals relating to the provision of their services for the use and guidance of operations personnel. They shall ensure that:

- (a) operations manuals contain the instructions and information required by the operations personnel to perform their duties;
- (b) relevant parts of the operations manuals are accessible to the personnel concerned;
- (c) the operations personnel are expeditiously informed of amendments to the operations manual applying to their duties as well as of their entry into force

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## Chapter 3 Safety Management System – (Reserved)

### 3.1 Introduction

3.1.1 The aeronautical telecommunications provider shall establish a Safety Management System (SMS).

3.1.2 The aeronautical telecommunications provider shall, as an integral part of the management of their service, have in place a safety management system (SMS) which:

- (a) ensure a formalised, explicit and proactive approach to systematic safety management in meeting their safety responsibilities within the provision of their service; operates in respect of all their service and the supporting arrangements under its managerial control; and includes, as its foundation, a statement of safety policy defining the organisation's fundamental approach to managing safety (safety management);
- (b) ensure that everyone involved in the safety aspects of the provision of aeronautical telecommunications service has an individual safety responsibility for their own actions; that managers are responsible for the safety performance of their respective departments or divisions and that the top management of the provider carries an overall safety responsibility (safety responsibility);
- (c) ensure that the achievement of satisfactory safety in aeronautical telecommunications service shall be afforded the highest priority (safety priority); and
- (d) ensure that while providing aeronautical telecommunications service, the principal safety objective is to minimise its contribution to the risk of an aircraft accident as far as reasonably practicable (safety objective).

*Note 1- The SMS to be implemented should not be just document or compliance-driven but should be fully integrated with the aeronautical telecommunications provider's day-to-day operations and should involve its entire staff, including that of its maintenance contractors, if any.*

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*Note 2- The key to a successful SMS is that all staff, from managers to engineers and technicians should be trained to understand the need for SMS, and this understanding should permeate to all staff to the lowest levels. It requires a change in attitude from all staff towards safety and the service provider should work towards nurturing a safety culture within the organization and its maintenance contractors.*

## **3.2 SMS Framework**

3.2.1 The SMS to be established shall comply with an SMS framework consisting of the following key components:

### **(a) Safety Policy and Objectives**

#### **(i) Management commitment and responsibility**

The SMS shall have a clear definition of the philosophy and fundamental approach the aeronautical telecommunications provider will adopt for the management of safety within its organization. This includes setting the safety policies and how they relate to the operation and maintenance processes of the service provider. The policies shall also clearly encapsulate the senior management's commitment to improve safety in the organization as a top priority, with the provision of the necessary human and financial resources for its implementation. The safety policy shall be periodically reviewed to ensure it remains relevant.

#### **(ii) Safety accountabilities**

The SMS shall have clear lines of safety accountabilities within the organization, including a direct accountability for safety on the part of senior management. Safety accountabilities shall be documented and communicated throughout the organisation.

#### **(iii) Appointment of key safety personnel**

The aeronautical telecommunications provider shall appoint a safety manager to serve as the focal point and driving force for the implementation and maintenance of SMS activities. However, the safety manager should not be held solely responsible for safety. Specific safety activities and the functional or operational safety performance and

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outcome are the responsibility of the relevant operational or functional managers and staff.

(iv) SMS implementation plan

The aeronautical telecommunications provider shall develop and maintain an SMS implementation plan that defines the organisation's approach to manage safety in a manner that meets the organisation's safety needs. The SMS implementation plan shall be endorsed by senior management of the organization.

(v) Documentation

A SMS manual shall be produced as part of the operations manual, as this is the key instrument for guiding and communicating the organisation's SMS approach and methodology to the whole organization. Guidance on the production of an SMS manual can be found in ICAO Doc 9859.

**(b) Safety Risk Management**

(i) Hazard identification process

The aeronautical telecommunications provider shall develop and maintain a formal process for effectively collecting, recording, acting on and generating feedback about hazards in operations, based on a combination of reactive, proactive and predictive methods of safety data collection.

(ii) Risk assessment and mitigation process

The aeronautical telecommunications provider shall develop and maintain a formal risk management process that ensure analysis (in terms of probability and severity of occurrence), assessment (in terms of tolerability) and control (in terms of mitigation) of risks to an acceptable level.

**(c) Safety Assurance**

(i) Safety performance monitoring and measurement

- (1) The aeronautical telecommunications provider shall develop and maintain the means to verify the safety

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performance of the organization compared to the safety policy and objectives, and to validate the effectiveness of safety risks controls. A safety incident reporting system shall be set up to collect any information on actual or potential hazards, maintenance errors or deficiencies and other safety incidents which are not normally reported in a formal fault reporting system.

- (2) The aeronautical telecommunications provider shall establish the safety performance indicators and targets of its SMS and submit them to ANS Standards Section Division for agreement. Details on the establishment of safety performance indicators and targets can be found in ICAO Document 9859.

(ii) The management of change

The aeronautical telecommunications provider shall develop and maintain a formal process to identify changes within the organization which may affect established processes and service. A risk assessment shall be carried out before the implementation of such changes, such as when upgrading or modification is made to an aeronautical telecommunication facility, in order to ensure safety performance.

(iii) Continuous improvement of the SMS

The aeronautical telecommunications provider shall develop and maintain a formal process to identify the causes of sub-standard performance of the SMS, determine the implications of sub-standard performance in operations, and eliminate such causes, in order to ensure the continual improvement of the SMS.

(iv) Safety investigation

Safety investigation is critical to the effectiveness of an SMS, and it shall be used as a means to improve the service provider's SMS. It is through a systematic safety investigation of incidents that shortcomings of the SMS could be uncovered and rectified. Any serious service failure or safety incident shall be investigated by the service provider as it may be indicative of potentially serious hazards. A systematic investigation may

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uncover systemic problems which otherwise may remain unnoticed. Requirements for such investigation are found in Section 7.2 of this BAR.

(v) **Safety audit**

Regular internal safety audits shall be conducted by the aeronautical telecommunications service provider to assure the effectiveness of its SMS. The safety audit shall be conducted by a team of trained auditors who are familiar with the operation of the aeronautical telecommunication service, but also independent and not involved with the day to day operation of the service. Regular safety audits shall also be conducted on the maintenance contractors to monitor their safety performance and obtain feedback to further improve on their SMS implementation. Records of such safety audits and corrective follow up actions shall be kept.

**(d) Safety Promotion**

(i) **Training and education**

The aeronautical telecommunications provider shall develop and maintain a safety training programme to ensure that personnel are trained and competent to perform the SMS duties. The scope of the safety training shall be appropriate to each individual's involvement in the SMS.

(ii) **Safety communication**

The aeronautical telecommunications provider shall communicate and promote the organisation's SMS processes and activities to its entire staff, including that of the maintenance contractors, to ensure that staff is fully aware of the SMS. The aeronautical telecommunications provider shall develop and maintain formal means for safety communication to ensure that staff is fully aware why particular safety actions and procedures are introduced or changed.

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## Chapter 4

### Personnel, and Training, Competency Assessment and Approval Requirement

#### 4.1 Personnel Requirement

- 4.1.1 The aeronautical telecommunications provider shall ensure that it has a sufficient number of competent personnel to perform the operation and maintenance of the aeronautical telecommunication service.
- 4.1.2 The aeronautical telecommunications provider shall provide in the operations manual an analysis of the number of personnel required to perform the aeronautical telecommunication service for each facility taking into account the duties and workload required.
- 4.1.3 The aeronautical telecommunications provider shall develop a job description for each of its personnel which shall describe their positions, responsibilities, functions, accountabilities and authorities. Organisation chart indicating the specific responsibilities shall be developed.
- 4.1.4 An ATSEP who performs either of the following - **(Reserved)**
- (a) system, operational or functional checks, including associated parameter checks and system performance measurements;
  - (b) system, component or software inspection, installation, repair, maintenance and modification;
  - (c) scheduled as well as unscheduled maintenance tasks shall be:
    - (i) trained in accordance with paragraph 4.2;
    - (ii) assessed to be competent in accordance with paragraph 4.3; and
    - (iii) approved in accordance with paragraph 4.4.

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## 4.2 Training of an ATSEP *(Reserved)*

- 4.2.1 The aeronautical telecommunications provider shall develop an ATSEP training programme that is acceptable to the ANS Regulator prior to its implementation.
- 4.2.2 The training programme shall be based on the ICAO Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment (Doc 10057) and the ATSEP competency framework included in the PANS-Training (Doc 9868). These shall be adapted to suit Brunei's operating environment.
- 4.2.3 As a minimum, the training programme shall comprise three levels as described below:
- (a) Level 1 (Basic training). This shall comprise training on the basic CNS/ATM systems operating in Brunei Darussalam and their impacts on the safety of aircraft operations. The aeronautical telecommunications provider shall ensure every ATSEP undergoes the basic training.
  - (b) Level 2 (Qualification training). This shall comprise training on knowledge and skills on CNS/ATM systems within one of these domains - Communications, Navigation, Surveillance and ATM systems. The aeronautical telecommunications provider shall ensure each ATSEP is trained in one or more domains depending on his job scope.
  - (c) Level 3 (Specialised training). This shall comprise training on specific CNS/ATM systems installed in Brunei Darussalam, followed by on-the-job training. The aeronautical telecommunications provider shall ensure every ATSEP described in paragraph 4.1.4(a), (b) and (c) undergoes specialised training.
- 4.2.4 The aeronautical telecommunications provider shall conduct a yearly review of the training plan for each ATSEP at the beginning of the year to identify any gaps in competency or changes in training requirements and prioritise the type of training required for the coming year.
- 4.2.5 The aeronautical telecommunications provider shall keep record of individual ATSEP training, competency assessment and approval history, where applicable, and associated documents. The record shall be kept at least until

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the CNS/ATM system of which the ATSEP was trained on is no longer in use with the aeronautical telecommunications provider.

4.2.6 The individual training records for each of ATSEP shall include a training plan detailing the courses completed as well as the time-frame for attending future courses as required under his/her training plan.

#### **4.3 Competency Assessment of an ATSEP (Reserved)**

4.3.1 The aeronautical telecommunications provider shall develop an assessment methodology to determine the competency of an ATSEP in accordance with the competency framework developed in PANS-Training and which shall be adapted to suit the local context.

4.3.2 The aeronautical telecommunications provider may select a person to be a competency assessor only if the person –

- (a) is an ATSEP approved in accordance with paragraph 4.4 for the particular CNS/ATM system; and
- (b) has received adequate training in the conduct of competency assessment, practical checks and oral questionings.

4.3.3 A competency assessor shall not conduct a competency assessment on an ATSEP who is under the direct supervision of the competency assessor, unless the assessment is done in the presence of a second independent assessor.

4.3.4 The assessment methodology shall include a process for on-going competency checking and refresher training to ensure retention of competence.

#### **4.4 Approval of an ATSEP (Reserved)**

4.4.1 The aeronautical telecommunications provider shall identify a unit (approval unit) to be responsible for the approval of an ATSEP before the ATSEP is allowed to undertake any functional checking and maintenance work on the CNS/ATM systems.

4.4.2 The approval unit shall be a unit that is involved in the planning, operations and/or maintenance of aeronautical telecommunication facilities and is independent of other operational departments in the aeronautical telecommunications provider.



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4.4.3 The approval unit shall develop an approval process that is acceptable to the ANS Regulator prior to its administration.

4.4.4 The approval unit may approve an ATSEP only if the ATSEP has –

(a) completed the three levels of training as described in paragraph 4.2.3; and

(b) been assessed to be competent and suitable to perform the role of an approved signatory for works done on the aeronautical telecommunications/ ATM system which the ATSEP has been trained on.

4.4.5 The approval unit shall –

(a) issue an approval document to each approved ATSEP;

(b) exercise appropriate administrative or remedial actions towards approval holders in event of negligence, incompetence or non-conformance; and

(c) ensure that the approval holder is current in the respective CNS/ATM system before deploying him to perform functional checking and maintenance of the respective system.

## 4.5 Training programme and Training Records

4.5.1 The aeronautical telecommunications provider shall establish and implement training programmes and procedures, to ensure the initial and continuing competence of operational personnel including continued competence (recurrent). Training programme shall include initial, recurrent or specialised training as well as competency on new equipment, procedures and communications systems.

The aeronautical telecommunications provider shall maintain individual training records for each staff, which shall include a training plan detailing the courses completed by each staff. Training records shall be systematically maintained and kept up-to-date on a timely basis.

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## Chapter 5 Commissioning of New Facility

### 5.1 Commissioning Procedures

5.1.1 The aeronautical telecommunications provider shall establish procedures to ensure that each new facility:

- (a) is commissioned to meet the specifications for that facility; and
- (b) is in compliance with the SARPS prescribed in ICAO Annex 10, where applicable.

5.1.2 The aeronautical telecommunications provider shall ensure that the system performance of the new facility has been validated by the necessary tests, and that all parties involved with the operations and maintenance of the facility, including its maintenance contractors have accepted and are satisfied with the results of the tests.

5.1.3 The aeronautical telecommunications provider shall ensure that procedures include documentation of tests conducted on the facility prior to the commissioning, including those that test the compliance of the facility with the applicable ICAO Annex 10 SARPS and any flight check required in compliance with ICAO Doc 8071.

### 5.2 Safety Case

5.2.1 The aeronautical telecommunications provider shall ensure that for safety critical systems, including automated ATC systems, VCCS and ILS, the commissioning of such systems shall include the conduct of a safety case or equivalent, e.g. Bowtie risk analysis method.

*Note 1 - A safety case is a structured and comprehensive analysis and documentation of the safety objectives, safety risk assessment and risk management of a system, starting from the definition of the operational requirement to the commissioning and commencement of operation of the system. It involves the identification of all the hazards associated with the system that provides the operational service, risk assessment of the hazards and the establishment of the necessary controls to ensure that the risks are managed. The end*

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*result is that all possible failures and fault modes have been identified and controls put in place to ensure that safe operation of the system is preserved under all modes.*

*Note 2 - A bow-tie analysis is a strategic risk management tool, whereby hazards and threats are identified on one side as a prelude to a top event and the consequences of the occurrence of a top event are also identified on the other side. A top event is an undesirable event with potential for harm or damage. Preventive controls are then identified to prevent threats from reaching the top event. Escalation factors which are issues that could compromise the effectiveness of the preventive controls are further defined together with escalation controls to control these escalation factors. Please refer to Appendix 1 which shows a chart of the bow-tie analysis.*

5.2.2 The safety case report shall be submitted to ANS Standards Section, Regulatory Division for comments and acceptance at least 1 month before the commencement of operation of the safety critical system.

### **5.3 Human Factors**

5.3.1 The aeronautical telecommunications provider shall ensure that human factors principles are observed in the design, operation and maintenance of aeronautical telecommunications facilities.

*Note – Guidance material on human factors principles can be found in the ICAO Human Factors Training Manual (Doc 9683) and Circular 249 (Human Factors Digest No. 11 – Human Factors in CNS/ATM Systems).*

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## Chapter 6 Operation and Maintenance Plan

### 6.1 Safety Requirements for Overall Operation and Maintenance Plan

6.1.1 The aeronautical telecommunications provider shall establish an overall operation and maintenance plan for the aeronautical telecommunication service, which shall as a minimum meet the following safety requirements as stipulated in ICAO Doc 4444, Chapter 2.

6.1.2 All facilities shall:

- (a) be tested for normal operations on a routine basis; and
- (b) meet the required level of reliability and availability.

6.1.3 In addition, the overall operation and maintenance plan shall:

- (a) provide for the timely and appropriate detection and warning of system failures and degradations;
- (b) include documentation on the consequences of system, subsystem and equipment failures and degradations; and
- (c) include measures to control the probability of failures and degradations.

### 6.2 Details of Operation and Maintenance Plan for Each Facility

6.2.1 In addition to the overall operation and maintenance plan, the aeronautical telecommunications provider shall establish an operation and maintenance plan for each facility. The plan shall include:

- (a) a procedure for the periodic inspection and testing of each facility to verify that it meets the operational and performance specifications of that facility;
- (b) details of flight test, if necessary, such as the standards and procedures to be used and flight test interval, which shall be in compliance with guidelines to ICAO Doc 8071 or any other appropriate ICAO document;

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- (c) the interval between periodic inspection and flight test and the basis for that interval. Whenever the interval is changed, the reasons for such change should be documented;
- (d) the operation and maintenance instructions for each facility;
- (e) an analysis of the number of personnel required to operate and maintain each facility taking into account the workload required;
- (f) the corrective plan and procedures for each facility, including such as whether the repair of modules and component are undertaken in-house or by equipment manufacturers; and
- (g) the spare support plan for each facility.

### **6.3 Test Equipment**

- 6.3.1 The aeronautical telecommunications provider shall ensure that appropriate inspection, measuring and test equipment are available for staff to maintain the operation of each facility.
- 6.3.2 The aeronautical telecommunications provider shall ensure the control, calibration and maintenance of such equipment so that they have the precision and accuracy necessary for the measurements and tests to be performed.

### **6.4 Interface Arrangement for Support Service**

- 6.4.1 The aeronautical telecommunications provider should formalize interface arrangements where applicable with external organisations in the form of service level agreements, detailing the following:
  - (a) interface and functional specifications of the support service;
  - (b) service level of the support service such as availability, accuracy, integrity and recovery time of failure of service; and
  - (c) monitoring and reporting of the operational status of the service to the service provider.

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*Note - Interface arrangements are arrangements that an aeronautical telecommunications provider has with other external organizations that provide support service which interconnect or interface with the aeronautical telecommunication service. Support service include leased circuit for voice or data communication, datalink service, radar, ADS-B or other electronic data sources of operational information.*

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## **Chapter 7 Facility Malfunction Incident and Radio Interference Reporting**

### **7.1 Facility Malfunction Incident Reporting**

- 7.1.1 The aeronautical telecommunications provider shall establish procedures for the reporting, collection and notification of facility malfunction incidents and safety incidents.
- 7.1.2 Reports of such incidents should be compiled and reviewed periodically by the aeronautical telecommunications provider with its maintenance contractors to:
- (a) determine the cause of the incidents and determine any adverse trends;
  - (b) implement corrective and preventive actions where necessary to prevent recurrence of the incidents; and
  - (c) implement any measures to improve the safety performance of the aeronautical telecommunications service.

### **7.2 Safety Investigation**

- 7.2.1 Any serious service failure or safety incident shall be reported to ANS Standards Section, Regulatory Division within 24 hours of occurrence and be investigated by the aeronautical telecommunications provider. The purpose of the investigation should be to understand how and why the incident happened, including possible organizational contributing factors and to recommend actions to prevent a recurrence.
- 7.2.2 A copy of the investigation report shall be forwarded to ANS Standards Section, Division within 6 weeks of occurrence. The lessons learnt from such investigation should also be disseminated to relevant staff to raise their safety awareness.

Note - Depending on the circumstances of the serious service failure or safety incident, such as whether the aeronautical telecommunications provider has violated any regulatory requirements, ANS Standards Section, Regulatory Division may conduct its own investigation in addition to that conducted by the aeronautical telecommunications provider.

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### **7.3 Management of Aeronautical Radio Spectrum**

7.3.1 The aeronautical telecommunications provider shall establish a procedure for the management and protection of aeronautical radio spectrum. Any frequency allocation within the aeronautical radio spectrum shall be centrally controlled by a designated responsible person to ensure that there will be no conflict and interference to any radio stations or facility. Updated records shall be kept of all allocated frequencies.

### **7.4 Radio Interference Reporting**

7.4.1 The aeronautical telecommunications provider shall ensure that there is no wilful transmission of unnecessary or anonymous radio signals, messages or data by any of its radio stations. Procedures shall also be established with the local telecommunication authority to address occurrence of radio frequency interference. Any frequency interference occurrence shall be reported, investigated and follow-up actions taken to prevent recurrence.

### **7.5 Notification of aeronautical telecommunication facility status**

7.5.1 The aeronautical telecommunications provider shall, as soon as possible

- (a) forward to the Aeronautical Information Service
  - (i) information on the operational details of any new facility for publication in the Brunei Aeronautical Information Publication; and
  - (ii) information concerning any change in the operational status of any existing facility, for the issue of a Notice to Airmen; and
- (b) ensure that the information forwarded under sub-paragraph (a) has been accurately published.



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## Chapter 8 Documentation and Records

### 8.1 Documents and Records to be maintained

8.1.1 The aeronautical telecommunications provider shall maintain all documents and records which are necessary for the operation and maintenance of the service. Copies of these documents shall also be made available to personnel where needed. These documents should include:

- (a) the BAR 10 - *Aeronautical Telecommunications*;
- (b) the aeronautical telecommunications provider's operations manual;
- (c) ICAO Annex 10 Volumes I to V, Doc 8071, Doc 9859 and other relevant ICAO documents;
- (d) records of hazard logs and risk assessments done;
- (e) records of malfunction and safety incident reports;
- (f) records of internal audit reports; (Reserved);
- (g) records of investigation into serious incidents; and
- (h) records of job description, training programme and plan of each staff.

### 8.2 Document Control

8.2.1 The aeronautical telecommunications provider shall establish a process for the authorization and amendment of these documents to ensure that they are constantly updated. The process shall ensure that:

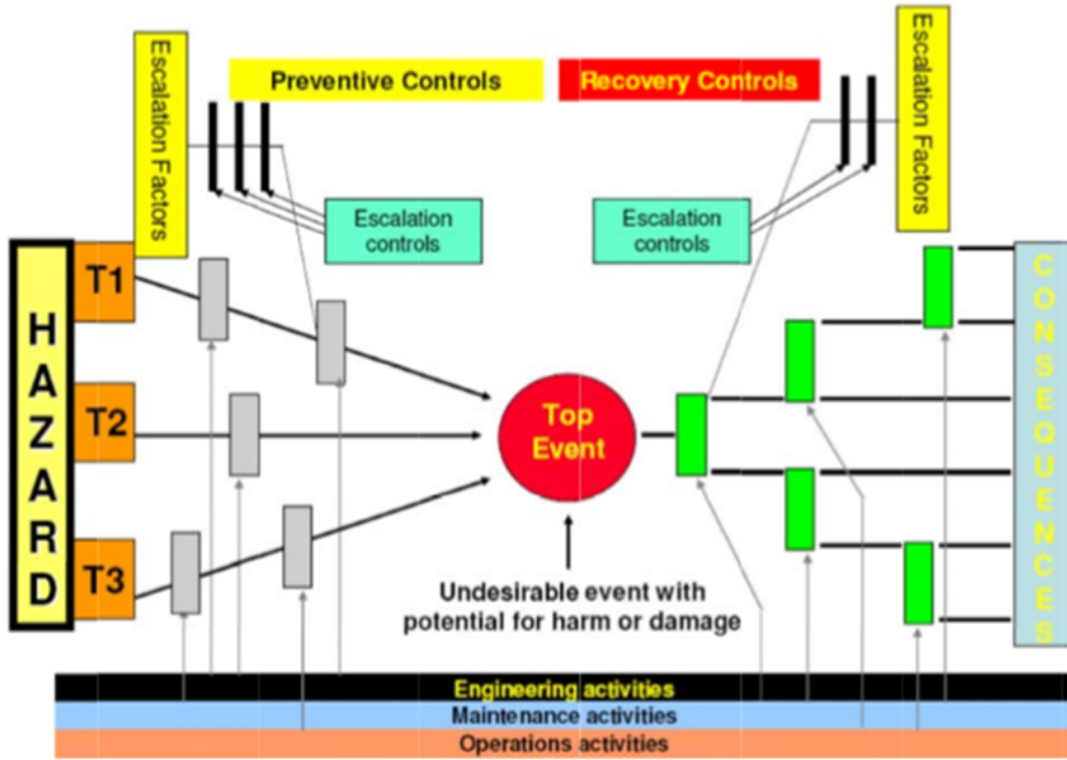
- (a) the currency of the documentation can be readily determined;
- (b) amendments to the documentation are controlled in accordance with established quality management principles; and
- (c) only current versions of documents are available.

8.2.2 The aeronautical telecommunications provider shall ensure that where documents are held as computer based records and where paper copies of computer based records are made, they are subjected to the same control as paper documents.

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## APPENDIX 1

### BOW TIE ANALYSIS CHART



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