

A stylized paper airplane icon is positioned in the center of the page, flying along a dashed line that represents a flight path. The path starts from the left, curves upwards, then downwards, and finally upwards again towards the right. The background features large, light grey, abstract shapes that resemble clouds or a map of the region.

CIVIL AVIATION GUIDANCE MATERIAL – 1100

ATC INCIDENT INVESTIGATION

CIVIL AVIATION AUTHORITY OF MALAYSIA

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Introduction

This Civil Aviation Guidance Material 1100 (CAGM - 1100) is issued by the Civil Aviation Authority of Malaysia (CAAM) to provide guidance for Air Traffic Services providers and personnel, pursuant to Civil Aviation Directive 11 – Air Traffic Services (CAD 11 – ATS) and Civil Aviation Directive 1101 – Air Traffic Management (CAD 1101 – ATM).

Organisations may use these guidelines to demonstrate compliance with the provisions of the relevant CAD's issued. Without prejudice to Regulation 165 and 167 of the Malaysian Civil Aviation Regulations 2016 (MCAIR 2016), when the CAGMs issued by the CAAM are used, the related requirements of the CAD's are considered as met, and further demonstration may not be required.



(Captain Chester Voo Chee Soon)
Chief Executive Officer
Civil Aviation Authority of Malaysia

Civil Aviation Guidance Material Components and Editorial practices

This Civil Aviation Guidance Material is made up of the following components and are defined as follows:

Standards: Usually preceded by words such as “*shall*” or “*must*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

Recommended Practices: Usually preceded by the words such as “*should*” or “*may*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

Appendices: Material grouped separately for convenience but forms part of the Standards and Recommended Practices stipulated by the CAAM.

Definitions: Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

Tables and Figures: These add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

Notes: Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

Attachments: Material supplementary to the Standards and Recommended Practices or included as a guide to their application.

It is to be noted that some Standards in this Civil Aviation Directive incorporates, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.

The units of measurement used in this CAD are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Guidance Material, the use of the male gender should be understood to include male and female persons.



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1 Definitions and Abbreviations

1.1 Definitions

When the following terms are used in these Guidance Material, they have the following meanings:

Accountable executive means the individual who has corporate authority for ensuring that all training commitments can be financed and carried out to the standard required by the Authority, and any additional requirements defined by the approved training organisation.

Aerodrome means a defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome Control Service means air traffic control service for aerodrome traffic.

Aeronautical Information Publication means a publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Air Navigation Services Standards Division (ANSSD) means Air Navigation Services Standards Division in the Civil Aviation Authority of Malaysia vested with the responsibility to regulate the air navigation services (ANS) provision.

Air Traffic means all aircraft in flight or operating on the manoeuvring area of an aerodrome.

Air Traffic Controller or Controller is a variously used to mean all Air Traffic Control Officers (ATCOs), Assistant Air Traffic Control Officers and Trainee Air Traffic Controllers.

Air Traffic Controller Licence means an Air Traffic Controller Licence granted or renewed under regulations 149 and 189 of the Civil Aviation Regulations 2016.

Air Traffic Control Instructions means directions given by an air traffic controller or an ATS unit for an aircraft to conduct its flight in the manner specified in the directions.

Air Traffic Control Service (ATCS) means a service provided for the purpose of:

- a) preventing collisions:
- b) between aircraft; and
- c) between aircraft and obstructions on the manoeuvring area; and
- d) expediting and maintaining an orderly flow of air traffic.

Air Traffic Service (ATS) means a generic term meaning variously flight information service, alerting service, air traffic advisory service, aeronautical information service and air traffic control service.

Air Traffic Service Provider (ATSP) means a person or unit approved under regulation 154 of Civil Aviation Regulations 2016 to provide air traffic services.

Approach Control Service means air traffic control service for arriving or departing controlled flights.

Approach Control Unit means a unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

Authority means the Civil Aviation Authority of Malaysia established under the Civil Aviation Authority of Malaysia Act 2017 [Act 788].

Area Control Centre means a unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

Area Control Service means Air Traffic control service for controlled flights in control areas.

Chief Executive Officer (CEO) means the Chief Executive Officer of Civil Aviation Authority of Malaysia.

Human Performance means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

Quality System means documented organisational procedures and policies; internal audit of those policies and procedures; management review and recommendation for quality improvement.

Rated Air Traffic Controller means an Air Traffic Controller holding a licence and valid ratings appropriate to the privileges to be exercised.

Rating means an authorisation entered on or associated with a licence and forming part thereof, stating special conditions, privileges or limitations pertaining to such licence.

State Safety Programme (SSP) means an integrated set of regulations and activities aimed at improving safety.

Threat management means the process of detecting threats and responding them with countermeasures that reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired states.

1.2 Abbreviations and Acronyms

AFIS	Aerodrome Flight Information Service
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ANSSD	Air Navigation Services Standards Division
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATMD	Air Traffic Management Division
ATS	Air Traffic Service
ATSM	Aerodrome Traffic Surveillance Monitor
ATSP	Air Traffic Service Provider
CAA	Civil Aviation Act
CAAM	Civil Aviation Authority of Malaysia
CAR	Civil Aviation Regulations
CEO	Chief Executive Officer
FIS	Flight Information Service
HOU	Head of Unit
ICAO	International Civil Aviation Organisation
MATS	Manual of Air Traffic Services
MCAR	Malaysian Civil Aviation Regulation
RMAF	Royal Malaysian Air Force
SARPs	Standard and Recommended Practices
SMS	Safety Management System
SOP	Standard Operating Procedure
SSP	State Safety Programme

2 General

2.1 Introduction

- 2.1.1 This guidance material is applicable to all Air Traffic Service Providers (ATSP).
- 2.1.2 An incident is any occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
- 2.1.3 A safety report shall be submitted for any occurrence which is related to the provision of air traffic services involving such events as aircraft proximity (AIRPROX), or other serious difficulty resulting in a hazard to aircraft, caused by, among others, faulty procedures, non-compliance with procedures, or failure of ground facilities.
- 2.1.4 Investigation of safety occurrences is part of safety management as it supports the removal of systemic safety deficiencies by identifying ‘why it happened’ rather than ‘who did it’.
- 2.1.5 The infringement of safety, particularly ‘airmiss’ shall be thoroughly investigated. The purpose of the investigation is to determine factors that caused the incident and not to apportion blame.
- 2.1.6 Findings of an investigation will indicate appropriate corrective measures to be taken to prevent recurrence of similar deficiencies.
- 2.1.7 Any controller involved in or aware of a safety occurrence is obliged to report the incident. These data are essential for the overall safety management and enhancing performance of the air traffic management system.
- 2.1.8 The ATS unit of provider shall established investigation process that include internal incident review panel and internal board of inquiry. These processes shall be in line with CAD 11 and CAD 19 requirements for the reporting and investigating as well as reviewing of air traffic incidents to promote safety.

2.2 Degree of Risks

- 2.2.1 Air traffic incidents will be classified under one of the following:
- a) AIRPROX (aircraft proximity);
 - b) Loss of separation;
 - c) Operational error;
 - d) Operational deviation;
 - e) Runway incursion;
 - f) Runway excursion; or

g) Pilot deviation.

2.2.2 AIRPROX is a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised.

2.2.3 The degree of risk of an AIRPROX is classified as follows:

- a) Risk of collision - The risk classification of an aircraft proximity in which serious risk of collision has existed;
- b) Safety not assured - The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised;
- c) No risk of collision - The risk classification of an aircraft proximity in which no risk of collision has existed; or
- d) Risk not determined - The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

2.2.4 Each type of incident and related risk(s) must be thoroughly examined to identify all contributing factors towards the occurrence of the incident. It is imperative to note that more than one factor may have cumulatively or subsequently lead to the final incident.

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3 Reporting Procedure

3.1 Incident Reporting Procedure

- 3.1.1 The established incident reporting system shall be utilised by personnel of the ATS provider to facilitate the collection of information on actual or potential safety hazards or deficiencies related to the provision of ANS, including route structures, procedures, communications, navigation and surveillance systems and other safety significant systems and equipment as well as controller workloads.
- 3.1.2 Safety reports shall be submitted for, but not limited to, the following:
- a) activation of alerts, such as STCA and MSAW, associated to degradation of safety/standard separation;
 - b) notification of ACAS event by flight crew;
 - c) non-compliance to ATC instructions;
 - d) non-compliance to standard operating procedures;
 - e) usage of non-standard phraseologies;
 - f) faulty navigation aids that limits/hinders the provision of ATC service; and
 - g) faulty equipment that limits/hinders the provision of ATC service.
- 3.1.3 All such reports shall be forwarded immediately to the Director of ATM Division/RMAF Markas Pemerintahan Operasi Udara (MPOU) and the Director of ANS Standards Division, while maintaining the strictest confidentiality.
- 3.1.4 The Director of ATM Division/RMAF MPOU or the directors, while maintaining the confidentiality of the reporter's identity, shall proceed to investigate the alleged ATC incident as per paragraph 4.1.
- 3.1.5 To assist in the investigation of such cases and to prevent a loss invaluable time, submission of the following minimum information is essential:
- a) date/time of incident;
 - b) aircraft call-signs; and
 - c) brief description of the incident, if possible.
- 3.1.6 If the reporter requires feedback, the identity and contact numbers can be included in the confidential report submitted.
- 3.1.7 Duty Air Traffic Controller(s)
- 3.1.7.1 In the event of an occurrence of an ATC incident (e.g. airmis, infringement, complaint from pilot / neighbouring ATC unit, or other related matters), the controller(s) shall:

- a) immediately make a verbal report of the incident to the Duty Watch Supervisor / SATCO (as applicable) giving as much details as possible;
- b) log in the details of the incident in the Log Book provided at the operational position; and
- c) submit a written report, in chronological order, to the ATSU Head, on the events leading to the incident including all actions taken by the controller. The report must be completed and submitted before the end of the shift duty.

3.1.8 Watch Supervisor / SATCO (as applicable)

3.1.8.1 Upon being notified of an ATC incident, these actions shall be taken;

- a) review the radar and/or radio tape recordings playback;
- b) retain flight progress strips and obtain the relevant weather reports;
- c) use discretion to relieve the controller(s) involved from operational ATC duties and arrange for a relief officer;
- d) as soon as possible (irrespective of whether the incident happens during, before or after office hours) make a verbal report to the ATSU Head (Manager / Director / RMAF Commanding Officer, as applicable). A similar verbal report shall be made to the Director of ATM Division in the case of CAAM;
- e) make a record of all actions taken in chronological order, pertaining to the incident; and
- f) submit a written report, in chronological order, to the ATSU Head, on the events leading to the incident including all actions taken by the controller. The report must be completed and submitted before the end of the shift duty.

3.1.9 The Head of ATSU Head, upon receipt of a preliminary ATC incident report, shall ensure that:

3.1.9.1 A copy of the report is forwarded to Director of ATM Division/ RMAF MPOU and the Director of ANS Standards Division using Form CAAM/ANS/INC 01 within 7 working days of the incident, inclusive of the following;

- a) the controller's & Watch Supervisor's written reports;
- b) copy of log book entries;
- c) weather reports;
- d) flight progress strips;
- e) R/T transcripts;



- f) radar plotting (if relevant);
- g) audio and video recording (if available); and
- h) any other relevant information (e.g. NOTAM).

3.1.9.2 The report includes comments regarding measures taken or possible measures to be taken to prevent a recurrence of the situation.

3.1.10 Pilot / Airline Safety Officer occurrence reports

3.1.10.1 On occasions, complaints may be submitted direct to ANS Standards using the CAAM Safety 001 Form or a formal letter or using the airline's safety reporting format. In these circumstances, ANS Standards will initiate the investigation and requests relevant ATSUs through ATM Division/ RMAF MPOU to submit information as per para 3.1.9 above.

4 ATS Providers Actions

4.1 Investigation by ATS Providers

- 4.1.1 Upon receipt of information of the occurrence of an ATC incident, ATS Providers shall commence an immediate investigation.
- 4.1.2 All available evidence and relevant material submitted shall be scrutinised, including playback of audio and radar recordings to ascertain the contributing factors leading to the incident. The investigating unit or personnel shall request for additional information if material submitted is insufficient to complete the investigation.
- 4.1.3 A combination of investigative techniques that include interviews, playback of recordings and discussion with appropriate operational personnel will be employed to determine the causes of the incident.
- 4.1.4 Standard procedures and separations that have been infringed shall be identified.
- 4.1.5 If it is determined that the incident occurred due to the negligence on the part of the Air Traffic Controller or the controller's actions are the major contributing factor of the incident, Director of ATM Division/RMAF MPOU shall ensure that the Air Traffic Controller shall be relieved from operational duties (if that has not been done at the preliminary stage at the operational unit).
- 4.1.6 If there is sufficient evidence to show that the incident occurred not due to ATC error, the Director of ATM Division/ RMAF MPOU can re-instate the controller that had been relieved from operational duties that may have been affected during the preliminary investigation stage.
- 4.1.7 Should there be immediate actions that are deemed appropriate to prevent similar safety occurrences, ATM Division/ RMAF MPOU shall forward recommendations to relevant ATSUs.
- 4.1.8 ATM Division/ RMAF MPOU shall compile a final draft report, within 21 working days after the incident is notified and all relevant material submitted.
- 4.1.9 The final report together with relieved and re-instate actions shall be submitted to the Director of ANS Standards Division.

4.2 Internal Incident Review Panel

- 4.2.1 The ATS Providers shall establish internal incident review panel as a means to determine the cause including the assessment of human factor.
- 4.2.2 This review panel is to enable analysis on actual or potential safety deficiencies and to determine any preventive measures required.

- 4.2.3 The terms of reference for the internal incident review panel are as follows:
- a) discuss the incident case by scrutinising all available evidence;
 - b) ascertain and conclude the contributing factors leading to the incident;
 - c) provide relevant input to complete the incident investigation report as appropriate;
 - d) record findings and propose appropriate safety recommendations; and
 - e) when required, recommend the convening of the internal board of inquiry.
- 4.2.4 The internal incident review panel shall consider the following circumstances, but not limited to, in considering a recommendation for an internal board of inquiry:
- a) All cases of risk of collision or safety not assured (i.e. serious risk of collision existed or safety of aircraft may have been compromised);
 - b) Violations by Air Traffic Controllers (i.e. deliberate departures from established rules, procedures, regulations, separation standards, etc.); or
 - c) In cases of serious incidents (i.e. an incident involving circumstances indicating that an accident nearly occurred); Examples include:
 - 1) Near collisions requiring an avoidance manoeuvre to avoid a collision / unsafe situation or when an avoidance action would have been appropriate;
 - 2) Controlled flight into terrain (CFIT) only marginally avoided;
 - 3) Aborted take-off on a closed or engaged runway;
 - 4) Landings or attempted landings on a closed or engaged runway; or
 - 5) Cases of separation breakdown during overshoot or missed approach.
 - d) Deficient ATC procedures to blame for the incident; or
 - e) Errors in which the good intention or plan was incorrectly carried out resulting in risk of collision.

4.3 Internal Board of Inquiry

- 4.3.1 The ANS Providers shall establish internal board of inquiry as a means to determine the actions to be taken following an internal incident review.
- 4.3.2 The functions and jurisdiction of the internal board of inquiry are as follows:
- a) examine the investigation report, evidence and/or any other related documents;
 - b) review the findings; and
 - c) interview the controller(s) to clarify information related to the incident.



- 4.3.3 The findings and recommendations by the internal board of inquiry shall be recorded and disseminated by the secretary within 7 working days after the sitting.
- 4.3.4 The internal board of inquiry shall decide on the reinstatement of the controller(s) involved, depending on the findings of the board.
- 4.3.5 Any controller, relieved from performing operational ATC duties due to involvement in an incident, shall be allowed to resume normal duties once the condition(s), if any, imposed by the internal board of inquiry is fulfilled.
- 4.3.6 The internal board of inquiry report shall be submitted to the Director of ANS Standards Division as soon as possible.

5 Incident Investigation Report

5.1 Report Format

- 5.1.1 An incident investigation report is compiled based on all available materials, evidence and documents in the following format:
- a) general information;
 - b) synopsis;
 - c) sequence of events;
 - d) factual information / analysis;
 - e) conclusion / findings; and
 - f) safety recommendation.
- 5.1.2 Copies of personal reports (controller, Watch Supervisor, etc) and other pertinent documents shall be included as appendices to the main report.
- 5.1.3 The objective of the report is to comprehensively document the incident, noting the contributory factors, discrepancies in procedures and other relevant factors that will allow it to be used as learning material in Operational and safety training.

5.2 Access to Original Records

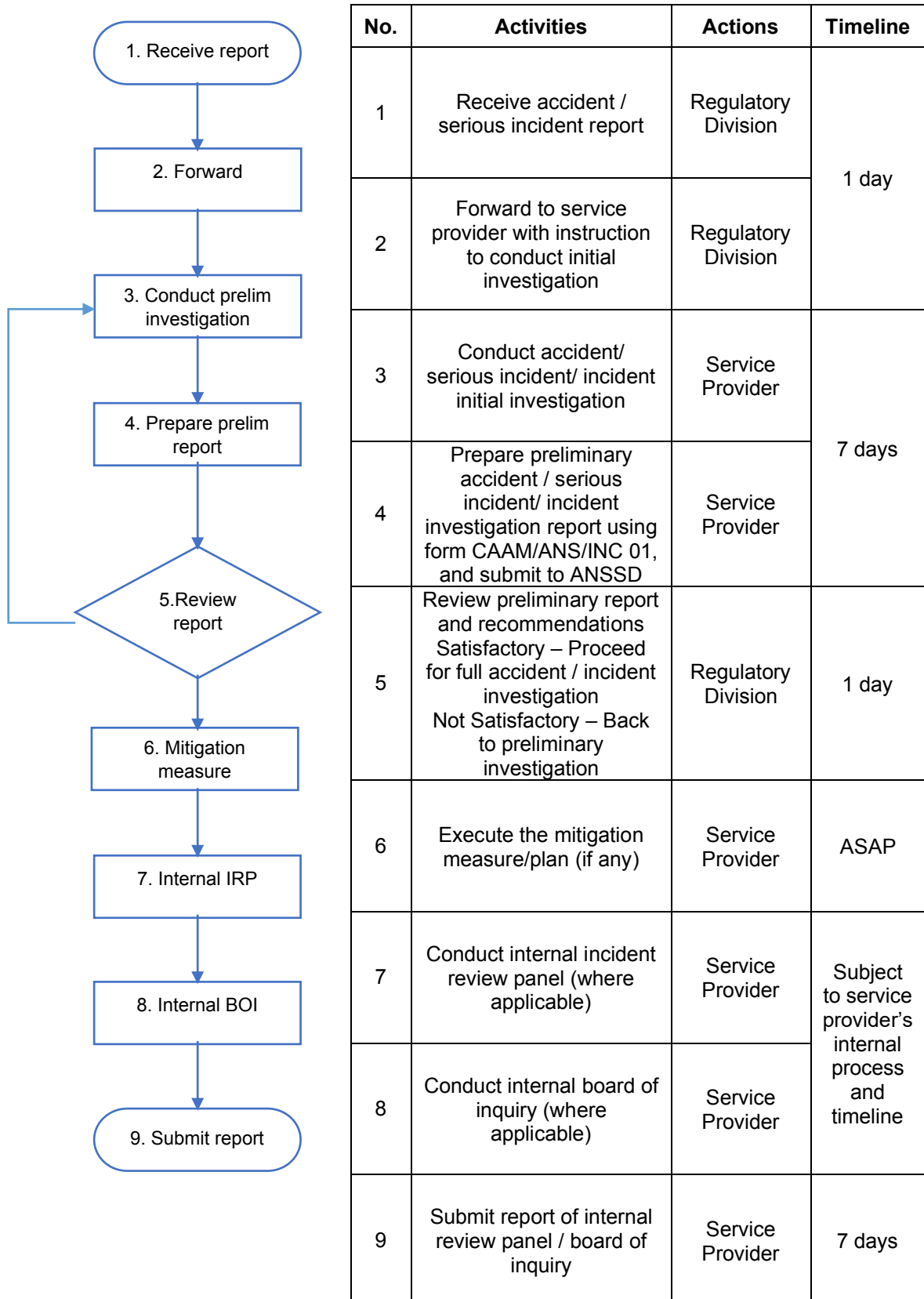
- 5.2.1 Access to original records shall be strictly controlled to:
- a) maintain confidentiality of the contents; and
 - b) protect evidence from being damaged.
- 5.2.2 All access shall be in the presence and/or authorisation of the Director of ATM Division/RMAF MPOU and shall be formally recorded.
- 5.2.3 In cases where playback is urgently required for Search and Rescue purposes, the ATSU Accountable Executive (i.e. Directors and Regional Directors) shall authorise such playback and inform the Director of ATM Division/ RMAF MPOU in writing. However, care must be taken to ensure that normal recordings are not interrupted and evidence not damaged.
- 5.2.4 All material associated with safety investigation shall not be released to any interested parties. Any request for relevant material such as radiotelephony transcript, shall be redirected to the ATM Division/ RMAF MPOU.
- 5.2.5 Usage of these materials for training purposes shall be on case-to-case basis. A formal request shall be submitted to the Director of ATM Division/ RMAF MPOU for consideration and approval.

5.3 Securing of Documentation and Recording Media

- 5.3.1 All documents and records related to an incident or accident have legal status if subject to a formal inquiry by the courts. As such, these materials must be carefully handled, secured and preserved until the investigation process is completed.
- 5.3.2 When an accident or incident has occurred that may be the subject of an official inquiry, the ATSU Head shall secure all related documents and records (voice tapes, radar data tapes, flight plan, flight progress strips, weather reports, logbook entries, R/T transcripts and radar plotting – whichever applicable), seal and forwarded to Director of ATM Division/ RMAF MPOU and Director of ANS Standards Division together with the report within the required stipulated time.
- 5.3.3 The receipt and handover of the documents and records shall be formally recorded and acknowledged.
- 5.3.4 All material associated with safety investigation shall not be released to any interested parties. Any request for relevant material such as radiotelephony transcript, shall be re-directed to the Director of ATM Division/ RMAF MPOU.
- 5.3.5 Usage of these materials for training purposes shall be on a case-to-case basis. A formal request shall be submitted to the Director of ATM Division/ RMAF MPOU for consideration and approval.
- 5.3.6 The materials that are approved for training purposes, in general, shall:
- a) de-identify names of controllers involved, aircraft callsign, location of ATSU etc; and
 - b) ensure hard and soft copies of the safety case, including audio visual recordings be returned and/or destroyed at the end of the training session.

6 Appendices

6.1 Appendix 1 – ATS Incident Investigation Flowchart





7 Attachments

7.1 Attachment A – ATC Incident Report Form



CIVIL AVIATION AUTHORITY OF MALAYSIA
(PIHAK BERKUASA PENERBANGAN AWAM MALAYSIA)

ATC INCIDENT REPORT

This form is to be completed by the officer conducting the preliminary incident investigation at the ATS Provider concerned. All material secured must be indicated in Part 6 and immediately submitted to Air Navigation Services Standards Division (ANSSD).

1. GENERAL INFORMATION

Reference	<input type="text"/>	Reportee	<input type="text"/>
Date	<input type="text"/>	Time (UTC)	<input type="text"/>
ATS Provider	<input type="text"/>	ATC Position	<input type="text"/>

AIRCRAFT 1

Callsign	<input type="text"/>	Type	<input type="text"/>
Departure	<input type="text"/>	Destination	<input type="text"/>
FL / Altitude	<input type="text"/>	Flight Phase	<input type="text"/>

AIRCRAFT 2

Callsign	<input type="text"/>	Type	<input type="text"/>
Departure	<input type="text"/>	Destination	<input type="text"/>
FL / Altitude	<input type="text"/>	Flight Phase	<input type="text"/>

2. SHORT DESCRIPTION OF OCCURRENCE

3. FACTUAL INFORMATION



4. PRELIMINARY FINDINGS AND CAUSES

5. ACTION TAKEN *(ATCO/pilot/procedures/ navaid, as relevant)*

List immediate action(s) taken after initial investigation to ensure non-recurrence

6. MATERIAL EVIDENCE SECURED *(Please tick and add as necessary)*

<input type="checkbox"/>	Audio (recording)	<input type="checkbox"/>	NOTAM
<input type="checkbox"/>	Radar (video)	<input type="checkbox"/>	UOI
<input type="checkbox"/>	Logbook	<input type="checkbox"/>	Shift Roster
<input type="checkbox"/>	Controller's report	<input type="checkbox"/>	METAR
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

7. ADDITIONAL INFORMATION (Other info not covered by Parts 1 to 6)

This report is completed by:

Name: _____ Date: _____

Signature: _____

Note:

1. Only signed reports shall be faxed or emailed (scanned copy).
2. Please save large audio/video files in CD and despatch to ANSSD.