



Civil Aviation Safety Authority  
of Papua New Guinea

# Advisory Circular

## AC141-4

### Certification of Aviation Rescue & Firefighting Training Organisation

Initial Issue

17 February 2026

#### GENERAL

Civil Aviation Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

#### PURPOSE

This advisory circular (AC) provides guidance on the design, implementation, and operation of a firefighting (ARFF) organization and training facilities associated with the certification of aerodromes under Civil Aviation Rule Part 141. It contains explanatory materials to assist in showing compliance which is acceptable to the director.

#### RELATED CAR

This AC relates specifically to Civil Aviation Rule 141.

#### CHANGE NOTICE

This Advisory Circular (AC141-04) is the initial issue. It introduces the first version of guidance material to support the certification of ARFF Training Organisation under PNG Civil Aviation Rule Part 141. There are no previous versions of this document.

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## SUBPART A - GENERAL

### 1.1 Purpose

1.1.1 Part 141 prescribes the rules governing the certification and operation of organisations conducting aviation training and assessments. Part 141 does not itself determine which training courses and assessments are to be conducted under this Part. Part 141 provides a means for the Director to ensure that certain training courses and assessments are conducted by either:

- (1) An organisation holding a **standard aviation training organisation certificate** for the purpose of conducting ongoing training courses and assessments, and subject to audit against their exposition by the Director, or
- (2) An organisation holding a **restricted aviation training organisation certificate** for the purpose of conducting one-off training courses, and subject to inspection by the Director against the appropriate requirements of this Part.

### 1.2 Application for Certificate

1.2.1 An application for the grant of an aviation training certificate must be made on the applicable form CA 141/01 and submit to the Director with the payment of the application fees.

- (1) Before submitting, do the research: A poor quality or incomplete application will be returned.
- (2) Check that the application includes everything CASA has asked applicants to supply. It is very important to submit a complete application, with all the documentation needed. An incomplete application will either be returned, or, if accepted, cause delays in the assessment.
- (3) CASA will only start the assessment once the submitted application is complete.

1.2.2 An initial payment may be required with each application. Participants may be invoiced for some of this during the course of the assessment, or it may be part of the final invoice. The application is to be supported by providing the appropriate senior person's applications (including Fit and Proper Persons (FPP) forms), the Part 141 matrices as appropriate, and the exposition.

1.2.3 In accordance with rule 141.5, Issue of Certificate, the Chief Executive (CE) and other key senior people must meet FPP requirements. See the section on rule 141.51, Personnel Requirements, for advice on FPP requirements for senior persons.

### 1.3 Privileges of Certificate

1.3.1 The aviation training certificate specifies the training courses and assessments that the holder is authorised to conduct under the classifications 'Training courses' and 'Assessments'. The following training courses and assessments presently require approval by the Director. They can only be conducted by organisations that hold an aviation training organisation certificate: The types of courses to be incorporate in the ARFF course syllabus should include;

- (1) Basic Firemanship Training
- (2) Intermediate Firemanship Training
- (3) Advanced Firemanship Training.

1.3.2 An organisation which holds a standard aviation training organisation certificate under Part 141 may also conduct training and assessment under the certificate for courses that do not require approval under rule 141.7.

1.3.3 A list of ARFF courses and assessments currently available for inclusion on an organisation's certificate may be found at Appendix 1, 2 & 3 – Training Courses and Assessments.

### 1.4 Duration of Certificate

1.4.1 Rule 141.9 (a) provides that a standard aviation training organisation certificate may be granted or renewed for a period of up to five years.

1.4.2 Certificates that expire, or suspended, or are revoked, must be returned to CASA. Certificates should be returned to the Director immediately at the address on the PNG CASA website.

- 1.4.3 Rule 141.9 (b) provides for a restricted aviation training organisation certificate to be granted for the period required to conduct a single training course.
- 1.4.4 To manage workflows, e.g. to prevent delays caused by applications being due just before holiday periods, CASA may grant a certificate for less than five years to ensure CASA assessors can progress applications efficiently.

## 1.5 Renewal of Certificate

- 1.5.1 Rule 141.11 (b) requires that the renewal application be submitted to the Director before the renewal date specified in the certificate or, if no such date is specified, not less than 30 days before the certificate expires.
- 1.5.2 An organisation is responsible for submitting their renewal application and supporting documents in sufficient time for CASA to process their application before their current certificate expires.
- 1.5.3 CASA strongly recommends that applicants send in applications earlier than this, if applications are likely to be complex or the exposition has changed significantly, so CASA can ensure they are assessed before the certificate expires.
- 1.5.4 The time taken to assess a renewal application varies by organisation. CASA's assessment focuses on aviation risk, so assessors consider:
- (1) the nature and scope of the aviation activity.
  - (2) the type of aviation risks being managed.
  - (3) how much the operator and their operation have changed.
  - (4) the operator's previous performance and
  - (5) their attitude towards safety and security.
- 1.5.5 The advice in the section on Rule 141.3, Application for certificate, about ensuring the application is complete is equally applicable to submitting a renewal application, as missing or incomplete documents are also likely to delay a decision on the renewal.
- See also the section on rule 141.51, for advice on FPP requirements for senior persons when renewing a certificate.

## 1.6 Specification for Approval

- 1.6.1 The specification for an ARFF aviation training organisation certificate shall contain at least;
- (1) Physical location of certificate holder principal base of operations,
  - (2) Certificate holders address for service in Papua New Guinea,
  - (3) Date of issue and period of validity and
  - (4) Terms and conditions of approval.

# SUBPART B – CERTIFICATION REQUIREMENTS

## 1.1 Personnel Requirements

- 1.1.1 An applicant for a standard aviation training organisation certificate must employ, contract or otherwise engage a senior person identified as the CEO. They will have the overall authority within the organisation, including financial authority, to ensure that the necessary resources are available to provide the training courses conducted under this rule.
- 1.1.2 The CEO is required to ensure that the organisation's activities are carried out in accordance with the procedures contained in their exposition or manual.
- The CEO must have:
- (1) the authority within the organisation to ensure the activities are performed in accordance with the applicable requirements,

- (2) the authority within the organisation to ensure appropriate training courses are taken to address the training requirements as per specified and
  - (3) the financial responsibility and resources are made available to support this.
- 1.1.3 As per rule 141.51(a) (2), the applicant is to employ, contract or otherwise engage one or more senior persons accountable to the CEO.
- 1.1.4 In smaller organisations, the CEO and the senior persons may be the same individual, but in all cases, there should be clear definitions of the position's responsibilities. Individuals undertaking one or more functions in the organisation should have a clear understanding of the division of responsibilities and be able to demonstrate this to CASA.
- 1.1.5 The areas of responsibility referred to above include the SMS, in particular, responsibility for:
  - (1) the organisation's SMS procedures,
  - (2) monitoring of the organisation's compliance with Part 141 and with its exposition,
  - (3) ensuring the adequacy of the organisation's exposition and associated procedures in meeting the requirements specified in Part 141 and in reflecting the organisation's activities,
  - (4) ensuring the implementation of actions to correct deficiencies in the organisation's documentation and procedures that are detected during internal quality assurance reviews, audits, or inspections of the organisation's activities and
  - (5) ensuring that conditions attached to the certificate or to any exemption are complied with. They must also include:
    - (a) training management and delivery and responsibility for the organisation's training,
    - (b) instructors,
    - (c) course material and
    - (d) training records.
- 1.1.6 The need for an SMS is discussed in more detail under section 141.61, below. All persons exercising privileges under the authority of a document holder, including all nominated senior persons, are required to meet FPP requirements. The persons nominated must be identified on the application form and a completed FPP form submitted for each person. The person's biographical details or curriculum vitae should accompany these forms.
- 1.1.7 When an organisation applies to renew their certificate, they need to include FPP forms for each of their senior persons. The declaration for an FPP assessment may be used by senior persons who have met FPP requirements previously, and can attest that there are no changes to their FPP status, i.e.:
  - (1) their health status and criminal conviction/ transport offence history is unchanged, and
  - (2) they are doing the same role for which they were granted FPP status.
- 1.1.8 Senior persons whose health status or criminal conviction/ transport offence history has changed, or who have taken on a new role with different scope and responsibilities, need to fill in an application for an FPP assessment.
- 1.1.9 Under rule 141.51(b) the applicant must establish procedures for initially assessing and then maintaining the competence of personnel conducting the training courses and assessments listed in the applicant's exposition.
- 1.1.10 Applicants should be able to demonstrate how their assessment and training procedure's function and ensure that:
  - (1) staff have the necessary levels of training, qualification, and experience, and
  - (2) staff have an adequate knowledge of the organisation's procedures relevant to their role in that organisation,
  - (3) on-the-job competency checks are carried out at regular intervals with appropriate continuation training to maintain competency levels, and
  - (4) continuation training includes instruction on changes in regulatory requirements and standards, and changes to the organisation's procedures and exposition.

- 1.1.11 Job descriptions need to be available for all positions within the certificate holder's organisation. The job descriptions for all personnel should define their responsibilities, authority, and their interrelationships. This is particularly important for personnel who need organisational freedom and authority and should include written documentation of any person's authorisations.

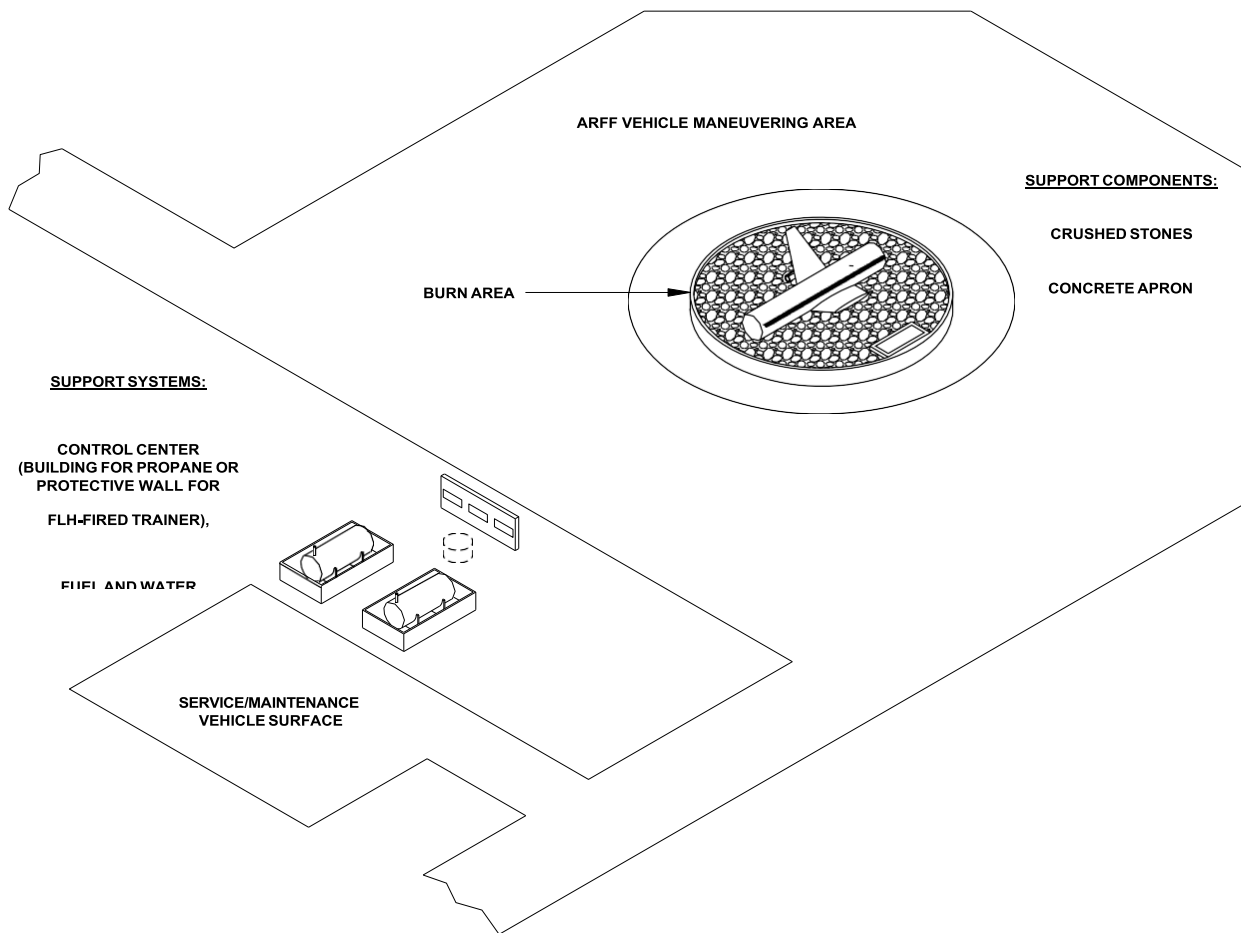
*Refer to Appendix 6 – Criteria for training Instructor/s.*

## **1.2 Facility Requirements**

- 1.2.1 The purpose of an ARFF training facility is to provide a safe training environment that is also visually and physically realistic, repeatable, and able to be documented. Training must not be so controlled as to give firefighters a false sense of security, nor can it disregard established safety procedures for the sake of increased realism. A balance between realism and safety must therefore be reached to achieve optimal training.
- 1.2.2 The standards and guidance in this AC allow for the safe and realistic replication of the flames, heat, and reduced visibility that ARFF personnel may encounter during a response to actual airfield emergencies.
- 1.2.3 Rule 141.53 requires applicants for the grant of a standard aviation training organisation certificate to provide facilities and resources that are relevant, accurate and appropriate to the training courses and assessments. Part 141 covers many areas of training, and because of the range of qualifications and experience available (professional, technical, and educational), it is neither possible nor desirable to provide a well desirable training avenue. It is recommended, however, that:
- (1) Classroom facilities be kept in a clean and in a conducive orderly condition.
  - (2) Each space used for examination purposes be adequately equipped, heated, lighted, cooled and ventilated, and located away from any distractions for the candidates.
  - (3) Classroom space must be designed to cater for at least 10 to 15 persons per instructor or less with sufficient space available to move around.
  - (4) Classroom space must not be confine and evacuation route available for exit in case of emergency.
  - (5) A rest room must be provided for both genders including cafeteria or tea rooms.
  - (6) Adequate training materials including table, chairs, whiteboard, projector, etc. to be provided.

## **1.3 Mock up / Fire ground Facility**

- 1.3.1 ARFF practical training ground facility should contain the following functional units, (refer Figure1):
- (1) Burn area - The burn area structure, or fire area.
  - (2) Vehicle manoeuvring area - This area physically surrounds the burn area structure and should be large enough to allow for the tactical operation of ARFF vehicles.
  - (3) Aircraft mock-up - A structure of a configuration and size that represents the typical complete aircraft with both wings servicing the airport.
  - (4) Control station -A system that allows an operator to configure and control the live pressure fed fire exercises of the training facility.
  - (5) Support systems:
    - (a) Fuel delivery / collection
    - (b) Water delivery / collection
    - (c) Electrical
    - (d) Water drainage system



**Figure 1. Basic components of a fire training ground facility**

## 1.4 Training Courses and Assessments

### 1.4.1 Courses

- (1) The **Basic Firemanship Training** course is designed to equip entry level of ARFF personnel with the necessary knowledge and skills to perform their tasks. Majority of the training will be devoted to practical exercises involving pressure-fed fuel fires to give ARFF personnel adequate exposure related to aircraft fire fighting.
- (2) The **Intermediate Firemanship Training** course is designed to equip experienced ARFF personnel with the theory, principles and practice of fire station management, tactical firefighting involving various emergencies and fireground command to prepare them for their roles as airport fire officers. Majority of the training will be devoted to practical exercises.
- (3) The **Advanced Firemanship Training** course is designed to equip senior fire officers with the theory, principles and practice of fire station management, facilities and fire safety planning, as well as command and control at aircraft crash site to prepare them for their roles as Senior Fire Officers or Fire Chief.

1.4.2 Particular attention must be paid to these courses as they cover the entry level training as well as leadership training for ARFF personnel. The certificate holder is required to send all their new ARFF personnel to be trained in basic firemanship at a training organization approved by PNG CASA.

1.4.3 Personnel performing supervisory roles shall also be sent to a training organization approved by CASA for the appropriate leadership courses depending on their types of responsibilities.

**Note -The guidelines for the course syllabus are provided in Appendix 1 to 3.**

- 1.4.4 When an approved training organisation conducts testing required for the issuance of a certificate, the testing shall be conducted by personnel designated by the training organisation in accordance with criteria approved by the Regulatory Authority.
- 1.4.5 Assessment tests of theory and practical modules related to the courses specified in Appendix 1 to 3 shall be in accordance with procedures and to a standard acceptable to the CASA. Annual audits will be conducted by CASA to ensure this is implemented.
- 1.4.6 Under rule 141.57(b)(2) applicants must have procedures in place to ensure that assessments meet the applicable training syllabus requirements listed in their exposition and are conducted without any compromise of the integrity of the assessments.
- 1.4.7 Instructors for approved courses, rule 141.51(b) directs an organisation to choose suitably qualified and/or experienced people to instruct and assess, and ensure they maintain their competence. The instructor must have greater qualifications and experience in the subject taught than the candidates in the particular course.

## **1.5 Records**

- 1.5.1 Rule 141.59 requires each applicant for the grant of a standard aviation training organisation certificate to establish procedures to identify, collect, index, store, and maintain the records that are necessary for the training courses and assessments listed in the applicant's exposition.
- 1.5.2 The records required by rule 141.59 may be kept in any format and should be controlled by a responsible senior person. Access to the record system should be controlled to ensure that the integrity of the records is maintained. The Director may require access to any of the records for certification or safety audit purposes. Records may also be required by the regulator for audit purposes.
- 1.5.3 Computer based systems may be used in place of paper for documents provided sufficient controls are established to maintain the integrity of the information held, and to provide a level of traceability equivalent to that required for paper documents. The records shall be retained for a minimum period of five years from date of completion of the training.

## **1.6 SMS (Safety Management System)**

- 1.6.1 Rule 141.61 requires each applicant for a standard aviation training organisation certificate to establish an SMS that meets the requirement of Part 100. To comply with this rule, organisations seeking certification must develop, document, implement, and maintain an SMS. This system should include internal audits and regular reviews of the SMS.
- 1.6.2 In practice, organisations will need to appoint a person/s to manage and run its SMS
- 1.6.3 This person will be responsible for;
- (1) helping the CEO to establish, implement and maintain a system for safety management in accordance with rule part 100,
  - (2) providing day-to-day leadership for people carrying out SMS work, noting the final responsibility sits with the CEO,
  - (3) ensuring the oversight and coordination of all SMS-related policies, procedures and activities, and
  - (4) reporting to and providing advice to the CEO and line managers on what is needed to run an effective SMS, including the resources needed to carry out this work effectively.

## **1.7 Quality Management Systems (QMS)**

- 1.7.1 An applicant of the grant of an aviation training organisation certificate must establish and implement a quality management system which meet the requirements of Part 100.

## **1.8 Aviation training organisation exposition/manual**

- (1) Rule 141.65 requires an applicant for the grant of a standard ARFF aviation training organisation certificate to provide the Director with an exposition. It sets out the procedures, means and methods of a certificated organisation to establish compliance with the rules.

- (2) The exposition will only be accepted by the Director if it meets all the requirements of Part 141.65 (a), (b), appropriate to the organisation. A certificate cannot be issued until the exposition is accepted by the Director.
- 1.8.1 The exposition is the means by which the certificate holder defines its operation. It shows both the employees and CASA how the certificate holder will conduct their day-to-day operations. The exposition is intended to be a tool to assist management in the operation of the business.
- 1.8.2 It also gives CASA assurance that an organisation has procedures to maintain compliance with applicable rules before CASA PNG grants entry into the system. The administration section of the exposition should normally be contained within one document. It should commence with the corporate commitment by the CE. The remaining parts of the exposition may be produced as any number of separate procedures manuals, provided that they are cross-referenced to the management part of the exposition.
- 1.8.3 Managers should have ready access to or hold copies of those parts of an exposition which affect their areas of responsibility. Training staff should have ready access to and be familiar with those parts of an exposition which affect their job. The following paragraphs address the individual requirements of the exposition:
- (1) Under the rules, each certificate holder has the responsibility to ensure that their operation is planned, organised, carried out, maintained, developed, and documented according to applicable regulatory requirements, standards, and operating specifications.
  - (2) As part of their SMS, each certificate holder should establish goals and objectives for their operation including safety standards equal to or above the level prescribed by the Director.
  - (3) The signed statement by the CEO required by rule 141.65, (a)(1) is accepted by the Director as a corporate commitment by the certificate holder. The statement may also contain the certificate holder's goals and objectives in respect of their commercial activities. The exposition should be a tool of management to present the certificate holder's operation to their staff, customers and to the Director.
  - (4) The certificate holder needs to show the lines of responsibility and communication between the CE and the work front in the organisational chart.
- 1.8.4 The applicant is to list the training courses to be covered by the certificate, and the locations at which they will be conducted. The course outline and curriculum contain more than just the syllabi. It might also include:
- (1) a description of each room used for ground training, including its size and the maximum number of students that may be instructed in the room at one time,
  - (2) the qualifications and experience required for each instructor position,
  - (3) the prerequisites required for enrolment in the course,
  - (4) a description of each lesson, including its objectives and standards, and the measurable unit of student accomplishment or learning to be derived from the lesson or course,
  - (5) the time scale of the course a description of the tests and checks used to measure a student's accomplishment at appropriate stages during the training, and
  - (6) the student attendance required by the organisation for satisfactory completion of the course and how any reasonable shortfall can be made up.
- 1.8.5 The exposition should have a section that outlines procedures for how the certificate holder will control, amend, and distribute the exposition. The acceptance of the applicant's exposition by the Director is the final step in approval for the issue of a standard aviation training organisation certificate.

## SUBPART C — OPERATING REQUIREMENTS

### 1.1 Continued compliance

- 1.1.1 It is the responsibility of the standard aviation training organisation certificate holder to ensure that:
- (1) the organisation continues to meet the certification requirements, and
  - (2) a complete copy of the exposition is held at each major location covered by the exposition.
- 1.1.2 The exposition may be electronic, provided the applicable parts are made available to staff to enable them to carry out their duties.

### 1.2 Changes to certificate holder's organisation

- 1.2.1 Rule 141.103 requires each holder of a standard aviation training organisation certificate to ensure that their exposition is amended to remain a current description of the holder's organisation.
- 1.2.2 The exposition is intended to be a living document to reflect the organisation's activities and its means to carry out those activities. Therefore, as the organisation's activities, means, methods and facilities change, the exposition is to be changed accordingly. The organisation must provide the Director with a copy of each amendment to the exposition.
- 1.2.3 Any changes to the certificate holder's procedures or standards that may affect the functions of the organisation need to be properly documented with background information and reasons for the change. Such documentation should be retained for possible audit trail purposes.
- 1.2.4 Rule 141.103(d) specifies the changes to the exposition that require the prior approval of the Director. This includes the senior persons, where the fit and proper person criteria are to be met, and changes that require a change to the certificate. The Director may also prescribe conditions that may be necessary for aviation safety because of a change in these items. The conditions may be transitional to allow the certificate holder to continue to operate while arrangements are made to incorporate permanent changes.

## SUBPART D — RESTRICTED AVIATION TRAINING ORGANISATION CERTIFICATE

### 1.1 Certification requirements

- 1.1.1 Under rule 141.151(a)(1) each applicant for the grant of a restricted aviation training certificate is required to engage, employ, or contract sufficient personnel to plan, conduct, and supervise the training course listed in the application. Where a certificate holder engages a third party to meet any requirement, the certificate holder remains responsible for that requirement.
- 1.1.2 Under rule 141.151(a)(2) the applicant must ensure the personnel who are conducting the training course have a combination of qualifications and experience greater than the level of qualification being taught.
- 1.1.3 Under rule 141.151(a)(3) the applicant must have facilities and resources appropriate to the training course listed in their application.
- 1.1.4 Under rule 141.151(a)(5) the applicant must have documented procedures for conducting the training course listed in their application.
- 1.1.5 Under rule 141.51 (b), an applicant must provide to the Director with details of their compliance with the requirements for the period the certificate remains in force.

## **SUBPART E — ACCEPTANCE OF FOREIGN TRAINING ORGANISATION**

### **1.1 Purpose**

- 1.1.1 Under rule 141.201, an applicant for the grant of a foreign aviation training certificate is accepted if the Director finds acceptable on the basis that, an approval has been issued by an ICAO contracting State.

### **1.2 Recognised Foreign Certifications**

- (1) An aviation training organisation certificate issued by any of the following foreign authorities will be accepted by the Director under this part;
  - (a) Civil Aviation Safety Authority – Australia
  - (b) Civil Aviation Safety Authority – New Zealand
  - (c) Civil Aviation Safety Authority – United Kingdom
  - (d) Department of Transport Canada
  - (e) European Aviation Safety Authority
  - (f) National Aviation Agency of Brazil
  - (g) Civil Aviation Safety Authority – Hong Kong
  - (h) Civil Aviation Safety Authority – Singapore
  - (i) Civil Aviation Bureau of Japan
  - (j) Civil Aviation Administration of China
  - (k) (Federal Aviation Administration of the United States)
- (2) An applicant for an Aviation Training certificate to be issued under paragraph (a) must provide to the Director with the following;
  - (a) a copy of the foreign Training organisation certificate
  - (b) a copy of the exposition required by the foreign authority
  - (c) the name of the chief executive and the senior persons who have responsibility for dealing with the Director on the following matters.
    - i. the performance of training activities,
    - ii. personnel competency and authorization,
    - iii. safety management system,
    - iv. quality management system.
- (3) Any information the Director may require regarding continuing validity of the foreign certificate.
- (4) The director may impose conditions and limitations on a foreign Aviation Training organisation certificate under paragraph (a).

# APPENDIX 1

## BASIC FIREMANSHIP TRAINING

### 1. GENERAL

- 1.1 Personnel whose duties consist solely of the provision of rescue and firefighting services for aircraft operations are infrequently called upon to face a serious situation involving lifesaving at a major aircraft fire. Therefore, in order to ensure that both personnel and equipment will be fit to deal with a major aircraft fire when the necessity arises, a most carefully planned and rigorously followed training programme is required.
- 1.2 The entire training programme must be designed to ensure that both personnel and equipment are at all times fully efficient. This represents a very high standard of achievement, but anything less than that is not only insufficient but may be dangerous to those who are in need of aid and also to the personnel who are providing such aid. The required course syllabus is listed in paragraph 2.

### 2. COURSE SYLLABUS

- 2.1 Basic Firemanship Training program shall be designed to equip entry level of airport fire fighters with the necessary knowledge and skills to perform their tasks. The majority of the training must be devoted to theory and practical exercises involving pressure-fed fuel fires to give fire fighters adequate exposure related to aircraft fire fighting.
- 2.2 The **Basic Firemanship Training** program of airport fire fighter course shall include at least the following areas:

**(a) Rescue and Fire Fighting Personnel Safety**

Fire fighters should also possess basic knowledge of fire chemistry, smoke hazards and various safety precautions. The training course should also contain hazards of helicopters and military aircraft.

**(b) Emergency Communications Systems**

Knowledge of operating radio communication equipment, proper procedures of radiotelephony communications and basic hand signals is essential to fire fighters in their operations.

**(c) Handling of Equipment**

All fire fighters must be trained in the use of fire hoses, nozzles, turrets and other appliances required for compliance with CAR 139 and Annex 14, Volume I, Chapter 9. All fire fighters must also be trained in the operation and maintenance of the range of basic rescue equipment listed in Appendix 4. They must be capable of handling their equipment, not only under drill ground conditions, but also in rapidly changing conditions. The aim is to ensure that every individual is so well versed in the handling of all types of equipment that he can perform automatically under stressful conditions.

**(d) Application of Extinguishing Agents**

It is essential to acquire thorough knowledge of the extinguishing agents employed in aircraft fire fighting. In particular, fire fighters shall be trained in the application of all the types of extinguishing agents required for compliance with Part 139 and Annex 14, Volume I, Chapter 9.

**(e) Emergency Aircraft Evacuation**

The training programme will need to provide instructions on aircraft evacuation procedures for different situations so that fire fighters can assist to evacuate occupants in the shortest time possible in the event of an aircraft accident or incident.

**(f) Fire Fighting Operations**

All fire fighters must have a general knowledge of the causes of fire, factors contributing to its spread and the principles of fire extinction. They should also possess knowledge of fire prevention.

All fire fighters are required to be trained in combating various types of fires such as;

- (a) Aircraft fires;
  - i. engine fire
  - ii. internal fire
  - iii. fuel line fire
  - iv. undercarriage fire
- (b) building fire;
- (c) liquefied petroleum gas fire,
- (d) bulk fuel fire and
- (e) other related fires.

**(g) Adaptation and Use of Structural Rescue and Fire Fighting Equipment's**

All fire fighters must be conversant with the proper usage and operation of various types of specialized rescue tools and firefighting equipment for structural and aircraft rescue and firefighting purposes.

**(h) Dangerous goods**

All fire fighters may be called upon to respond to an incident or accident involving hazardous materials. As such, they will require basic knowledge on detection methods and containment measures.

**(i) Familiarization with Fire Fighters' Duties under the Aerodrome Emergency Plan**

Under the Aerodrome Emergency Plan, fire fighters are assigned to perform specific roles and responsibilities such as rescue operation, firefighting, emergency medical care, casualty evacuation, ambulance service and logistics support in an aircraft accident or incident.

**(j) Protective Clothing and Respiratory Protection**

All fire fighters may be called upon to affect a rescue from an aircraft cabin in conditions of great stress working in an atmosphere heavily laden with smoke and fumes. As such, they must be carefully trained to use self-contained breathing apparatus. Simulators to train fire fighters to operate in such environments will be necessary.

**(k) Medical First Aid and Casualty Handling**

Every fire fighter of the rescue team shall be trained in first aid so that they can provide medical assistance when necessary and casualties are intelligently handled so as to avoid the infliction of additional suffering and / or injury in the removal of occupants in an aircraft accident or incident.

**(l) Search and Rescue**

The training program shall provide instruction in search procedures, not only in the enclosed spaces of an aircraft but also for procedures for systematic searching of the area in the immediate vicinity of an aircraft accident and in the path of the aircraft.

Rescue operations should be accomplished through regular doors and hatches wherever possible, but fire fighters must be trained in forcible entry procedures with the necessary tools.

**(m) Care of Equipment and Maintenance**

A thorough knowledge of all equipment is essential in order to ensure its correct handling and to ensure thorough maintenance, which is essential to guarantee operational efficiency under all circumstances. It is vitally important that every firefighter be satisfied that any piece of equipment which may be used will work properly and, in the case, if ancillary equipment, that it is in its correct stowage position.

### **3. ON-JOB TRAINING**

3.1 Personnel who have completed the Basic Firemanship Training shall receive the following on-the-job training in the fire station they are posted to:

#### **(1) Airport Topography**

A thorough knowledge of the airport and its immediate vicinity is essential. The training shall encompass those areas of operation dealing with:

- (a) Aerodrome topography of the movement areas so that fire fighters can demonstrate their ability to:
  - i. Select the best routes to any point at the airport.
  - ii. select alternative routes to any point on the movement area when normal routes are blocked.
  - iii. recognize landmarks which may be indistinctly seen.
  - iv. use detailed grid maps as an aid to respond to an aircraft accident or incident; and
  - v. recognize airport signs, markings, and lighting.
- (b) The use of guidance equipment when it is available. Air traffic control may be of assistance in providing information on the location of the accident site and position of other aircraft or vehicles at the airport which may obstruct or impair vehicular movement.

#### **(2) Aircraft Familiarization**

It is essential that all firefighters have an intimate knowledge of all types of aircraft using the airport. Information about the following design features is of special importance to fire fighters to ensure effective use of their equipment:

- (a) different types of aircraft
- (b) various parts of an aircraft and its functions.
- (c) location and operation of normal and emergency exits.
- (d) seating configuration.
- (e) evacuation procedures of recusing casualty from crash aircraft.
- (f) type of fuel and location of fuel tanks.
- (g) location of batteries; and
- (h) position of break-in points on the aircraft.

#### **(3) Fire Vehicle Operations**

Fire truck operation is a critical function, and firefighters must acquire the knowledge and skills before operating the vehicle.

- (a) Legislative requirements applying to emergency vehicles in PNG
- (b) Conduct pre-use inspections and checks
- (c) engine start up and shut down procedure
- (d) procedure for reversing, stopping, parking and securing the vehicle
- (e) pump 'n' roll while discharging from roof turret, bumper and under truck

#### **(4) Fire Communication Procedures**

Aviation radio telephony procedures and fire control center functions have to be totally taught before fire officers can perform the obligations.

- (a) Watch room procedures,
- (b) Emergency Turnout procedures,
- (c) Radio Telephony procedures,
- (d) Journal entry procedures and
- (e) Inspection and testing procedures.

## APPENDIX 2

### INTERMEDIATE FIREMANSHIP TRAINING

#### 1. COURSE SYLLABUS

1.1 Intermediate Firemanship Training programme should be designed to equip experienced airport fire fighters with the theory, principles and practice of fire station management, tactical firefighting involving various emergencies and fire-ground command to prepare them for their roles as airport fire officers. Majority of the training should be devoted to practical exercises.

1.2 The Intermediate Firemanship Training programme should include at least the following areas:

**(1) Proficiency Test and Rating System**

This lesson provides general guidelines on the subjects to be covered in the operational rating system. It is also a reference for organizing and standardizing the proficiency rating and revalidation system to maintain the proficiency standards of all airport fire-fighters. The documentation and proficiency rating records to facilitate audit checks will be discussed.

**(2) Critical Area Concept and Response Time**

The training programme should enable participants to determine the theoretical and practical critical area for a given aircraft type and calculate the quantity of water to be provided at an aerodrome. They will also need to be able to calculate response time based on certain assumptions and recognize factors affecting response time.

**(3) Aircraft Internal Fire (Passenger and Freighter Aircraft)**

Participants shall acquire a thorough knowledge of aircraft internal fire. They shall be able to explain differences between post-crash fires and inflight fires, know the types of cabin furnishings and toxic gases produced. The participants must also know the causes of internal fires, flashovers and backdrafts. The training programme shall also include rescue and firefighting procedures during an internal aircraft fire.

**(4) Breathing Apparatus Application**

Fire fighters may be called upon to affect a rescue from an aircraft cabin in conditions of great stress working in an atmosphere heavily laden with smoke and fumes. As such, they must be carefully trained to use self-contained breathing apparatus. Simulators to train personnel to operate in such environments will be necessary if provided.

**(5) Fireground Control at Crash Site**

It is important that the fire ground be managed by using all resources of manpower, equipment, water supply and associated agencies. Being capable of assimilating all available information about the actual scene is paramount to safe action. The training programme should equip participants with the necessary skills to undertake the position of Office-in-Charge during an emergency. They shall be taught on the various types of stand-by positions taken by the ARFFS for various declared aircraft emergencies and be able to explain the overall strategy of Fireground Leadership during aircraft fire fighting and rescue operations. The course should also include Airport Emergency Planning as well.

**(6) Rescue and Fire Fighting Equipment**

ICAO requires States to provide rescue and firefighting equipment and services at an airport. Participants shall be able to determine the quantity and types of equipment to be carried on fire vehicle(s) and recommend suitable personal protective equipment for rescue and firefighting operations.

**(7) Airport Water Supply**

The training programme shall provide basic guidance in master planning and overall water supply system for airport fire protection, taking into consideration domestic water usage where a combined fire protection and domestic water system is utilized. It will also include basic selection criteria for water supply sources and standards for a water distribution system designed to support aircraft and fire-fighting operations in airports.

**(8) Airport Categorization and Levels of Protection**

Participants shall be able to determine the airport category of an aerodrome and understand the level of protection to be provided. They shall also be able to state the minimum quantities of water, level A and B foams and other complementary extinguishing agents required for protection. The participants shall be taught the basic need and number of vehicles required at an airport to effectively deliver and deploy the agents specified for the airport category.

**(9) Leadership in the Fire Service**

As the fire service evolves and becomes an increasingly diverse and dynamic industry, the need for competent leadership also grows. The training programme shall include the theories of leadership and the relationship between leadership style and the decision-making process.

**(10) Building Firefighting and Rescue**

The training programme shall include the significance and importance of the various basic divisions of fire-fighting strategy. The participants shall be able to demonstrate effective execution on firefighting tactics and techniques in combating structural building fires.

**(11) Fireground Hydraulics**

Hydraulics is a critical element in firefighting. As soon as movement of water through a hose line is attempted, knowledge of hydraulics is required. The training programme shall include the principles, variables and calculations concerned with the practical application of water as utilized in the fire service. An overview of fire characteristics, properties of water, apparatus and appliances, fire streams and hydraulic calculations shall be addressed to establish a functional understanding of fire ground hydraulics.

**(12) Fire Pumps and Primers**

Water-based fire-suppression systems rely on an adequate water supply for proper operation, and fire pumps are often required to increase available water pressure. Training must be given to equip personnel with the necessary knowledge to understand and effectively operate the pumps.

**(13) Handling of Uncommon Emergencies**

Fire fighters may be called upon to respond to an incident or accident involving hazardous materials. The training programme shall provide instructions on operational procedures and tactical concepts of water rescue operations for aircraft accidents in the water. Participants shall also be informed about the types of radioactive materials, radio-active hazards and the strategic procedures of combating an aircraft fire involving radio-active materials.

**(14) Foaming Agents**

A major aircraft accident typically involves a fuel-spill fire, and the main extinguishing agent is foam. Existing regulations require that significant quantities of a foam/water agent be available to support aircraft fire fighting and rescue operations. Training shall be given to participants to enable them to understand the type of foam used in relation to aircraft fire fighting.

**(15) Communication Procedures and System**

Knowledge of operating radio communication equipment, proper procedures of radiotelephony communications, and basic hand signals is essential to fire fighters in their operations. Participants shall be trained to have a thorough knowledge in radiotelephony procedures.

**(16) Fire in Aircraft Hangars**

The extremely high value of aircraft, hangars, and their ancillary facilities requires the thoughtful application of knowledge of the hazards involved. The training programme shall present to the participants the various hazards, restrictions of movement, needs for evacuation, structural vulnerability, and various other factors to be considered when dealing with such fires.

**(17) Post-Crash Incident Report**

Participants shall be taught how to write reports based on the accident/incident format using standardized words to give relevant information to improve methods of saving lives.

**(18) Techniques of Instruction**

An airport fire officer may be tasked to conduct lessons or give presentations to fellow firefighting personnel. The training programme should equip the officer with the necessary skills.

**(19) Principles of Supervision**

An airport fire officer will need to exercise direct supervision over assigned staff. Training must be able to cover this aspect as well.

**(20) Fire Prevention Inspection**

Participants shall be taught on the objectives of fire prevention and the fire protection system to prevent fire from spreading and further endangering life and property.

**(21) Aircraft Involved in Unlawful Act**

The training programme examines the risks involved and the ways to deal with a situation where an aircraft is subjected to unlawful interference, namely hijacks, bomb threats and chemical or biological sabotage.

**(22) Smoke Hazards**

The training programme shall cover hazards of gases and smoke. It will also cover the 3 phases of fire, procedures when working in a smoke-filled atmosphere, and case studies of aircraft incidents with smoke impact.

## APPENDIX 3

### ADVANCE FIREMANSHIP TRAINING

#### 1. COURSE SYLLABUS

- 1.1 Advanced Firemanship Training programme should be designed to equip Senior Fire Officers (SFO) with the theory, principles and practice of fire station management, facilities and fire safety planning, as well as command and control at aircraft crash sites to prepare them for their roles as Senior Fire Officers.
- 1.2 The Advanced Firemanship Training programme should include at least the following areas:

**(1) Aerodrome Safety Management System**

Related closely to safety policy (and safety culture) is how an organization sets its objectives. Clearly stated objectives can lead to a commitment to action that will enhance the safety of the organisation. In some organisation no explicit safety objectives are stated. A few exceptional organizations set their objectives formally, clearly enunciating their vision, defining desired outcomes, spelling out the attainable steps for meeting the objectives, and documenting the process. They have agreed to relevant safety indicators and have adopted realistic safety targets.

**(2) Airport Fire Safety Management**

The key to successful fire safety is not just airport fire and rescue services, but a holistic approach to the whole airport environment. Participants shall be taught fire safety management measures for airport terminal buildings, hangars, and surrounding facilities. Fire prevention and fire safety practices in airports also need to be covered. The course shall equip participants with the knowledge to advise on the formation of Emergency Control Organizations (AS 3745).

**(3) ARFF Vehicles' Standards**

The ability to respond to airport emergencies with adequate and appropriate equipment is paramount to ARFF personnel. The course shall enable participants to:

- (a) State ICAO requirements on ARFF vehicles.
- (b) Stipulate requirements of ARFF vehicles for an airport.
- (c) Select from options available for ARFF vehicles; and
- (d) Specify the performance of ARFF vehicles for the purpose of procurement.

Participants should be informed of the latest technology and advanced ARFF vehicles that are used in major airports around the world.

**(4) Budgeting in Airport Fire Service**

Estimates of expenditure are a projection of the fiscal records of a particular department to operate off efficiently. Participants shall at least appreciate the need for budgeting and be able to differentiate between the two estimates submissions.

**(5) Design and Siting of Airport Fire Station**

The primary focus of airport fire station design is to provide rapid response for fire fighters and vehicles responding to an alert. Station configuration should incorporate maximum views of the airfield and direct access from the apparatus bays to the road and runway system. The training programme shall provide standards and guidance for planning, siting, designing and construction of airport fire stations.

**(6) Emergency Online Communication System**

Each level of the fire ground organisation has a different need and capability to communicate. Those differences will necessarily affect the entire communications process as fire operations continue. The Fire Ground Commander (FGC) is on the command level and deals with decision making, assignments, coordination, revision and control as he determines the overall strategy and manages the attack plan.

**(7) Fire Precaution in Buildings**

Fire precautions are the measures taken and the fire protection provided in a building or other fire risk to minimize the risk to the occupants, contents and structure from an outbreak of fire. The advanced firemanship course shall include the aims for taking fire precautions in buildings and the concepts in building construction relevant to fire precaution.

**(8) Fire Service Administration**

Participants shall be taught on the managerial role of a senior fire officer and the basic functions of management in the fire service. They shall be able to distinguish between management and leadership.

**(9) Fire Vehicle Performance Test**

The training programme shall cover the standard for aircraft fire vehicle six-month performance test in accordance with Annex 14.

**(10) Hangar Fire Protection**

The extremely high value of aircraft, hangars, and their ancillary facilities requires the thoughtful application of knowledge of the hazards involved. Participants shall be taught on fire protection recommended for aircraft hangars.

**(11) Hazards of Aircraft Fueling Operations**

The airport authority, the aircraft operator, and the fuel supplier each have responsibilities in respect of the safety measures to be taken during fueling operations. Training must be able to cover this aspect.

**(12) Airport Services Manual**

The training programme should cover parts of the Airport Services Manual that are related to aerodrome rescue and firefighting.

**(13) Mass Casualty Evacuation**

A mass casualty incident would significantly stress airport resources and would require fatality management capabilities and a surge in EMS and hospital response. The training programme shall equip participants with the skills and knowledge to manage this.

**(14) Planning and Development of ARFFS**

Senior Fire Officers will likely be involved in master planning for their ARFFS. As such, the course shall be able to cover this.

**(15) Training and Proficiency Test**

One of the objectives of the course is to ensure that Senior Fire Officers are conversant with the basic and specialist training required for ARFFS personnel to deal with aircraft emergencies.

**(16) Water Rescue Plan**

The course shall include basic planning procedures, facilities and equipment to effectively perform rescue operations when an aircraft crashes into a body of water, swamp, or tidal area where normal ARFFS vehicles are unable to reach the accident scene.

**(17) Equipment Specification and Evaluation**

Specifying and purchasing firefighting equipment can be difficult exercise for officers who are unfamiliar with the procedures involved. Many purchasers rely solely on the advice and guidance of the salesperson. This can add to the apprehension and anxiety of the officer who is tasked with obtaining the required equipment at a reasonable price. The course shall impart adequate information and guidance materials to the participants on equipment specification.

**(18) Emergency Planning & Coordinating**

Multi-Agency Coordination and Joint Exercises for Senior Fire Officers shall be trained in multi-agency coordination protocols to ensure effective collaboration during large-scale emergencies. Training should be included.

- (a) Roles and responsibilities of police, medical, and aviation authorities.
- (b) Communication protocols and incident command systems (ICS).
- (c) Planning and execution of joint simulation exercises involving all stakeholders.
- (d) Debriefing and lessons-learned documentation.
- (e) The training organization shall facilitate at least one joint exercise annually and submit a report to the Regulatory Authority.

## APPENDIX 4

### EQUIPMENT FOR RESCUE OPERATIONS

#### 1. EQUIPMENT LIST

- (1) A general knowledge of all equipment is essential in order to ensure its correct handling and to ensure thorough maintenance, which is essential to guarantee operational efficiency under all circumstances.
- (2) All fire fighters must be trained in the operation and maintenance of the range of basic rescue equipment:
  - (a) Lighting equipment
  - (b) Power operated tools
  - (c) Ladders
  - (d) Hand tools
  - (e) Hydraulic tools
  - (f) Rescue ropes
  - (g) Forcing entry equipment
  - (h) Respiratory protection equipment
  - (i) Communications equipment
  - (j) Equipment capable of delivering water spray with aircraft fuselages
  - (k) Equipment capable of delivering a fresh air supply, probably by means of a powered-fan unit and incorporating trucking to suit aircraft delivery purposes
  - (l) Medical first aid equipment
- (3) The inspection and maintenance records must be consistent and updated in accordance with manufacturer's manual or guidelines.

## APPENDIX 5

### TRAINING SIMULATORS

#### 1. ESSENTIAL TRAINING SIMULATORS

- 1.1 A proper range of training simulators is critical to equip fire fighters with the necessary skills to perform their tasks. Improper training or lack of simulators may not only impede their performance but be dangerous to themselves and people involved in the accident or incident.
- 1.2 The training organization shall have or an agreement with a third party who has the following essential simulators:
  - (1) Breathing apparatus simulator
  - (2) Military aircraft fire simulator
  - (3) Civil aircraft fire simulator
  - (4) Fire pits or trays
  - (5) Flashover simulator
  - (6) Confined space simulator
  - (7) Fire truck driving simulator
- 1.3 A simulated aircraft fire must include a pit of fire or a fire with an aircraft mock-up or similar device using enough fuel to provide a fire intensity which simulates realistic firefighting conditions.
- 1.4 At times when a simulator or other firefighting training facilities is unserviceable, the training organization needs to ensure that it is rectified as soon as possible, and in the meantime, source for an alternative or replacement to ensure that training provided by the organization will not be affected and thus standards will not be compromised.

## APPENDIX 6

### TRAINING INSTRUCTORS

#### 1. CRITERIA FOR TRAINING INSTRUCTORS

- 1.1 It is imperative that the instructors are able to accommodate a broad range of training needs. Besides good knowledge of ICAO Standards and Recommended Practices, instructors must be able to meet a set of entry requirements.
- 1.2 The following set of requirements applies to instructors providing training for Basic Firemanship Training, Intermediate and Advance Firemanship Training:
  - (1) Must have a training qualification from a recognized organization.
  - (2) Must have a minimum of 5 years' experience with an ARFF service provider or other relevant organization.
  - (3) Leadership exposure in operations with an ARFF service provider or similar role.
  - (4) Pass the Intermediate Firemanship Training course or similar course.
  - (5) Pass the Breathing Apparatus Operations Training Course.
  - (6) Must possess relevant instructional techniques.
  - (7) You must possess effective communication skills.
  - (8) Must be able to conduct theoretical and practical assessments; and
  - (9) Must possess a valid Medical First Aid certification.
- 1.3 As for instructors providing training for the Advanced Firemanship Training course, he or she shall, in addition to the set of requirements listed above, pass the Advanced Firemanship Training course or higher.
- 1.4 Instructors must have training qualifications with certificate in;
  - (1) Train the Trainer,
  - (2) Training and Assessment,
  - (3) In structural Techniques,
  - (4) Course Developments or
  - (5) Any relevant credentials for firefighting training qualifications.