Belize Department of Civil Aviation

ADVISORY CIRCULAR

Subject: RFF REQUIREMENTS, PERSONNEL, TRAINING AND PROCEDURES

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1. PURPOSE

This Advisory Circular (AC) provides guidance on the requirements that RFF vehicles and equipment, personnel, protective clothing, respiratory equipment, RFF Fire Station, training, procedures and rescue operations must be in accordance with BDCA Belize Civil Aviation Regulations (BCAR 139), and ICAO Doc. 9137 Part 1.

2. WHAT CANCELS THIS A.C?

This AC cancels BDCA AGA-09-2018 First Issue, Revision 0.

3. WHO DOES IT AFFECT?

This document impacts the responsibilities of operators of international aerodromes of the State and to which the BCAR 139 it is applicable. For simplicity this advisory circular refers to aerodromes to which BCAR 139 applies to:

(a) The aerodrome operators for public service located in domestic territory and used in:

(1) Regular and irregular international operations with any type of aircraft.

(2) Regular and irregular local operations involving aircraft with a maximum take-off weight greater than 20,000 Kg or more than thirty seats for transportation of passengers, cargo or mail.

4. RELATED READING MATERIAL.

- BCAR 14 Design and Construction of Aerodromes
- BCAR 139 Aerodrome Certification, Operation and Surveillance
- ICAO Document 9137 part 1

Approval

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Part 1 -RFF Vehicles and Equipment

1. General

Specifications for specialized equipment and vehicles to be used in difficult environments have not been included in this Part 1.

a. The aerodrome operator or service provider responsible or the Chief fire officer in charge of Rescue and firefighting must establish a preventive maintenance and inspection program for the equipment and vehicles of the aerodrome RFF, whether the maintenance of the same is carried out by their own personnel, or a supplier is contracted of the external maintenance service.

b. In any case, the program must be done in a correct, timely manner and be available to the BDCA Inspectors when they request it.

2. Technical characteristics of RFF vehicles

a. Vehicles that have to be used for the rescue and extinction of aircraft fires must have at least the characteristics expressed in Table 1.1 and comply with at least the following characteristics:

Table 1.1 Minimum characteristics of rescue and fire fighting vehicles.

	RFF vehicles up to 4 500 L	*RFF vehicles over 4 500 L*
Monitor	Optional for categories 1 and 2 Required for categories 3 to 9	Required
Design feature	High discharge capacity	High and low discharge capacity
Range	Appropriate to longest aeroplane	Appropriate to longest aeroplane
Handlines	Required	Required
Under truck nozzles	Optional	Required
Bumper turret	Optional	Optional
Acceleration	80 km/h within 25 s at the normal operating temperature	80 km/h within 40 s at the normal operating temperature
Top speed	At least 105 km/h	At least 100 km/h
All-wheel drive capability	Required	Required
Automatic or semi-automatic transmission	Required	Required
Single rear wheel configuration	Preferable for categories 1 and 2 Required for categories 3 to 9	Required
Minimum angle of approach and departure	30°	30°
Minimum angle of tilt (static)	30°	28°

b. The capacity of the foam concentrate tank should be sufficient to provide the specified concentration for twice the capacity of the water tank.

c. RFF vehicles should have the characteristic of continuously maintaining foam production while traveling at minimum speeds of 8 km / h.

d. The RFF vehicle cab should be large enough to accommodate the specified personnel and various equipment items, facilitate rapid access and egress of personnel, considering that each firefighter will be equipped with their protective equipment, and must have adequate insulation against the vibrations and the noise.

e. RFF vehicles must have safety belts, first aid kit, spare tire, safety triangle, etc.

f. RFF vehicles must have visual audible devices that allow them to be identified as emergency vehicles, they must comply with national or local legislation, and with any lighting and sound regulations.

g. The airport's emergency vehicles must be painted with highlighting colours, preferably red or yellowish green.

h. When the fleet of vehicles is renewed, the technical characteristics of Table 1.1 should be considered.

i. There should be a provision of spare parts and critical elements of the RFF vehicles, especially the elements of electronic type, in such a way that they ensure an immediate repair before being put out of service, in order to avoid prolonged periods, with the RFF capacity diminished.

j. Vehicles that have electronic devices to control the application of extinguishing agents and management of operational capabilities of such vehicles, must have redundant systems to ensure the reliability of the system in critical operating conditions.

3. RFF Tools and Equipment

a. The aerodrome operator or service provider responsible or the chief fire officer in charge of Rescue and firefighting must provide special tools to the RFF personnel, so that they can penetrate inside the fuselage, which is essential; but its use can only be considered as an extreme measure, when ordinary means of access cannot be used, or when, for special reasons.

b. Based on the RFF category of each aerodrome, at least the following rescue and firefighting equipment must be available.

Guidance material related to rescue equipment carried on RFF Vehicles are shown in Table 1-2

Table 1-2 Rescue equipment that each RFF vehicle must have

Equipment Scope	***Equipment Item***	***Airport Category***			
		1-2	**3-5**	**6-7**	**8-10**
Forcible entry tools	Prying Tool (Hooligan, Biel type)	1	1	1	2
	Crowbar 95 cm	1	1	1	2
	Crowbar 1.65 m	1	1	1	2
	Axe, rescue large non wedge type	1	1	1	2
	Axe, rescue small non wedge or aircraft type	1	2	2	4
	Cutter Bolt 61 cm	1	1	2	2
	Hammer 1.8 kg Lump or Club type	1	1	2	2
	Chisel cold 2.5 cm	1	1	2	2
A suitable range of rescue/cut in equipment including powered rescue tools	Hydraulic/Electrical (or combination) portable rescue equipment	1	1	1	2
	Powered rescue saw complete with minimum 406mm diameter spare blades	1	1	1	2
	Reciprocating/Oscillating saw	1	1	1	2
A range of equipment for the delivery of firefighting agent	Delivery hose 30 m lengths x 50 & 64 mm diameters	6	10	16	22
	Foam Branches (Nozzles)	1	1	2	3
	Water Branches (Nozzles)	1	2	4	6
	Coupling adaptors	1	1	2	3
	Portable fire extinguishers				
	CO^2	1	1	2	3
	DCP	1	1	2	3
Self-Contained Breathing Apparatus – *sufficient to maintain prolonged internal operations* *Note: Ideally one BA set per crew member.*	Breathing Apparatus (BA) set c/w facemask and air cylinder				
	BA spare air cylinder				
	BA spare facemask				
Respirators	Full faced respirators c/w filters	One per responding fire fighter			
A range of ladders	Extension Ladder, Rescue & suitable for critical aircraft	-	1	2	3
	Ladder General Purpose – rescue capable	1	1	1	2
Protective clothing	Firefighting helmet, coats, over trousers (c/w	One set per operational fire			

	braces), boots & gloves as a minimum	fighter plus a % of reserve stock			
Additional items for personal protection	Protective goggles	1	1	2	3
	Flash hoods	One per operational fire fighter			
	Surgical gloves	1 Box	1 box	1 box	1 box
	Blanket Fire Resisting	1	1	2	2
Rope lines	Rope Line Rescue 45 m	1	1	2	2
	Rope Line General Use 30 m	1	1	2	2
	Rope Line Pocket 6 m	One per operational fire fighter			
Communication Equipment	Portable transceivers (hand held & intrinsically safe)	1	2	2	3
	Mobile transceivers (vehicle)	One for each fire vehicle			
A range of hand held /portable lighting equipment	Hand held flashlight (intrinsically safe)	1	2	4	4
A range of general hand tools	Portable lighting – spot or flood (intrinsically safe)	1	1	2	3
	Shovel overhaul	1	1	2	2
Recuse Tool Box & Content	Hammer, claw 0.6 kg				
	Cutters, cable 1.6 cm				
	Socket set				
	Hacksaw, heavy duty c/w spare blades				
	Wrecking bar 30 cm				
	Screwdriver set – Slotted & Phillips heads				
	Pliers, insulated Combination 20 cm Side Cutting 20 cm Slip Joint – Multi Grip 25 cm				
	Seat Belt/Harness cutting tool				
	Wrench, adjustable 30cm				
Equipment scope	Equipment item	1-2	3-5	6-7	8-10
	Spanners, combination 10mm – 21 mm				
First aid equipment	Medical First Aid Kit	1	1	2	3
	Automated External Defibrillator (AED)	1	1	2	3
	Oxygen Resuscitation Equipment (ORE)	1	1	2	3
Miscellaneous equipment	Chocks & Wedges – various sizes				
	Tarpaulin - lightweight	1	1	2	3
	Thermal Imaging Camera	-	-	1	2

C The rescue equipment specified in **Table 1-2** must be transported in vehicles that are responding to an Aircraft accident or Incidents.

Aerodromes serving international routes should have at least the following equipment available for

rescue at the scene of any aircraft accident:

a. portable lighting equipment providing flood and spot lighting
b. power operated cutting tools that can be operated from a portable power source
c. hand tools including wire and bolt cutters, screwdrivers of appropriate sizes and designs, crowbars, hammers, axes, metal and wood saws
d. forcing equipment, usually hydraulically operated, for bending or lifting operations
e. sufficient breathing apparatus sets
f. Medical first aid equipment, ideally consisting of pre-packed wound dressings in protective containers, scissors, adhesive dressings and burn dressings, stretchers or spine boards and blankets, oxygen cylinder.
g. communications equipment in the form of radiotelephone units and a portable loud hailer
h. Miscellaneous items including shovels, grab hooks, lines (cordage), harness cutting knives, and ladders of appropriate type and length, related to the likely aircraft types involved a powered fan unit capable of extracting contaminated air from aircraft.

Communications

When rescue and firefighting vehicles leave the fire stations and enter the manoeuvring area, they come under the direction of the control tower. These vehicles shall be equipped with two-way radio communications equipment, through which their movements can at all times, be subject to direction by the control tower.

The radio equipment on rescue and firefighting vehicles shall accommodate communication between vehicles, en-route to, and in operation at, an aircraft accident. Within individual vehicles there should be an intercommunication system, particularly between drivers and monitor-operators, to optimize the deployment of the vehicles at an accident.

The rescue and fire fighting vehicles shall be provided with communication equipment capable of communicating directly with an aircraft in a situation of emergency using an aeronautical radio frequency. The aeronautical radio frequency permits the rescue and firefighting service and the emergency aircraft, to communicate with each other directly.

Extinguishing Agents

Complementary extinguishing agents

The complementary agent(s) required:

a. carbon dioxide (CO_2) or
b. dry chemical powders or
c. a combination of the agents stated in items (a) and (b).
d. Compatibility must be ensured when selecting dry chemical powders for use with foam.

Foam concentrates

Any foam concentrate to be used in rescue and firefighting vehicles shall meet or exceed the criteria of the ICAO specifications; so as to achieve performance level B.

Foam characteristics

The quantity of foam concentrate separately provided on vehicles for foam production shall be in proportion to the quantity of water provided and the foam concentrate selected.

The amounts of water specified for foam production are calculated on an application rate of 5.5 L/min/m² for foam meeting performance level B.

For agent substitution, the following equivalents shall be used: ·

1 kg dry chemical powder or 2 kg CO_2 = 0.66 L water for production of a foam meeting performance level B.

Reserve supply

A 200% percent reserve supply of foam concentrate for the runway category shall be maintained on the aerodrome for vehicle replenishment purposes.

Where a major delay in the replenishment of this supply is anticipated, the amount of reserve supply shall be increased.

If the 200 percent reserve supply of foam concentrate is temporarily not available on the aerodrome the runway rescue and firefighting category need only be reduced, when the quantity of foam concentrate available falls below 100 percent of that for the normal category.

The quantity of foam concentrate provided on a vehicle shall be sufficient to produce at least two loads of foam solution.

Water supplies

Supplementary water supplies, for the expeditious replenishment of rescue and firefighting vehicles, should be pre-arranged. The objective of providing additional water supplies at adequate pressure and flow is to ensure rapid replenishment of aerodrome RFF vehicles. This supports the principle of continuous application of extinguishing media to maintain survivable conditions at the scene of an aircraft accident.

Additional water to replenish vehicles may be required in as little as five minutes after an accident; therefore, an analysis shall be conducted to determine the extent to which it, and its associated storage and delivery facilities, shall be provided.

When conducting the analysis, the following factors are amongst those items which shall be considered but not limited to:

a. sizes and types of aircraft using the aerodrome
b. the capacities and discharge rates of aerodrome fire vehicles
c. the provision of strategically located hydrants
d. the provision of strategically located static water supplies
e. utilization of existing natural water supplies for firefighting purposes
f. vehicle response times
g. historical data of water used during aircraft accidents
h. the need and availability of supplementary pumping capacity
i. the provision of additional vehicle-borne supplies
j. the level of support provided by local authority emergency services
k. the pre-determined response of local authority emergency services
l. fixed pumps where these may provide a rapid and less resource-intensive method of replenishment
m. additional water supplies adjacent to airport fire service training areas
n. overhead static water supplies

Response Capability

Frequency of rescue and firefighting response verification

The holder of an aerodrome operating certificate shall regularly complete a rescue and firefighting response time verification. Response time verifications should normally be held with a periodicity of between 1 and 3 months.

Response location

The verification shall require a fire vehicle to produce water through the vehicle’s monitor at the correct operating pressure, immediately upon arrival at a nominated location.

Response timing

The response time verification shall be initiated using the normal emergency response activation

procedures detailed in the AEP, and the time required from the activation to the production of water at the nominated location shall be recorded.

The response timing verification shall be carried out during periods of minimal or no traffic so that the fire vehicles are not disrupted during the verification and the vehicles can be serviced before the next scheduled aircraft movement. The timing verification shall be carried out during daylight hours and with dry surface conditions.

Rescue and Firefighting Advisory Status

Procedures

Should the need arise to remove the vehicle for maintenance, or in the event that RFF or in the event that due to lack of personnel, extinguishing agents or equipment, the level of protection required is reduced, the following tasks shall take place:

a. A representative of RFF will complete the Rescue & Firefighting Service form in its entirety. Upon completion, he/she will advise the Aerodrome Operations Manager regarding the status; sample form presented as Form 01

b. Once received, the Aerodrome operator will acknowledge receipt of the form via email and will ensure that the Manager of Safety & Emergency Planning has been notified;

c. In the event that the form indicates that there is a change in the level of protection is required, the Manager of Safety & Emergency Planning or his designate, will file a NOTAM immediately with the AIS office to indicate the change and to alert aircraft operators.

d. If the event continues longer than the indicated end time on the 'Rescue and Firefighting Advisory Status form', RFF will provide an update to the Aerodrome Operations Manager via email with an anticipated end time as soon as practicable. This is especially important when there has been a change in category as this new information must now be promulgated.

e. Once the event has ended, the 'Equipment Return to Service' Form shall be completed by an RFF Representative and sent via email to operations of the Aerodrome.

f. Once notified, the Manager of Safety and Emergency Planning (Aerodrome) or his designate will acknowledge receipt and cancel any applicable NOTAMs that may have been disseminated. This is presented as Form 02

Form 01
Rescue & Fire Fighting Advisory Status

Date: .....

From: Insert RFF authorized representative..... ……

To: Aerodrome Operator..... ……..

Maintenance/Change Advisory *(select)*……..

Please be advised that due to *(missing personnel, unit(s) out of service, extinguishing agents, lack of water, etc)*

……

……

……

the level of protection of the RFF service will be decreased to category …….

Expected return to service is *(insert time/date)* ……

Please notify the industry by NOTAM

Signed by: .....

RFF authorized representative *(name and signature):*

..... ……

.

Received by: ..... *(Insert Aerodrome Representative)*

Form 02

RFF Return to Service Advisory

Date/time: ……

From: Insert RFF authorized representative .....……..

To: Aerodrome Operations ..... …….

Please be advised that the RFF has been returned to service and the firefighting Category remains/or has been restored to *(insert category number…….)*. Please advise all concerned entities.

Signed by: ..... ……*(name and signature)*

Received by: ..... ……*(Insert Aerodrome Representative)*

Part 2 - PERSONNEL, PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION.

1. Personnel

a. The aerodrome operator or service provider responsible Rescue and firefighting must be designated to direct RFF services of the airport. The responsibilities of this person should include general administrative supervision of the service, control of effective personnel training and operational control of the role assigned to RFF in the aerodrome emergency response plan and those other responsibilities assigned by the organization, for the fulfilment of its mission.

Self-contained respiratory equipment shall be provided for those personnel who are required to enter a smoke filled cabin, or operate in the presence of smoke or toxic gases.
Respiratory protection should be provided for those personnel who may be required to work in areas where breathing may be hazardous due to air borne particles (e.g. composite materials).

b. During air operations, the aerodrome operator must have sufficient, competent and properly trained personnel in RFF, service so that it can intervene immediately, with rescue and fire fighting vehicles, and manage the equipment to its maximum capacity. These personnel must be able to deploy themselves in such a way that it can intervene in a minimum response time and achieve the continuous application of extinguishing agents to a regime according to the level of protection of the aerodrome established in Table 4 CAGR Schedule 21 Part B and meeting the operational goal of response times.

c. The RFF service at the aerodrome must be composed of a minimum staff of firefighters, in each shift, according to or indicated in the letter **d.** and that are available to operate the vehicles and equipment of the RFF service at its maximum capacity, and cover the schedules of aerodrome operation according to its category. The number of personnel must be adequate to equip the RFF vehicles in their extinction tasks and ensure the evacuation in the shortest possible time of the largest aircraft that uses the Aerodrome.

d. In determining the minimum number of personnel necessary for rescue and firefighting operations, the aerodrome operator or service provider responsible or Officer in charge of RFF must perform an analysis of the resources required for the task and document in the Aerodrome Manual the staffing level, according to the RFF category of the aerodrome. The minimum necessary personnel must not be less than that indicated in the following table:

Category Airport	Num. of Vehicles	Num. of Personnel per Vehicle	Total No. of Personnel
Category 1, 2, 3, 4 & 5	1	3	**6**
Category 6 & 7	2	3	**9**
Category 8	3	3	**12**
Category 9 & 10	3	4	**15**

This table 1-3 clearly defines the RFF category, for each Aerodrome and its personnel who will ride the Rescue and Firefighting Vehicles as per Category.

Table 1-4 give the Minimum Number of AFF Organization Structure and its personnel as per Category, at each Aerodrome.

MINIMUM NUMBER OF RFF PERSONNEL PER AERODROME				
Amount of RFF Personnel	**Category 1, 2, 3, 4 ,5**	**Category 6 7**	**Category 8**	**Category 9 10**
Experienced and trained Chief	1	1	1	1
Deputy Fire Chief				1
Fire Officers				3
Watch room	1	1	1	1
Drivers	1	2	3	3
Firefighters	2	6	6	9
EMT / Paramedic	1	1	1	1
TOTAL	**6**	**9**	**12**	**15**

The Authority (BDCA) has to give the approval for all of the Requirements for RFF Personnel at all each Aerodrome.

RFF personnel must be trained and certified in aircraft rescue and firefighting, first aid, incident response with hazardous materials, and rescues in confined spaces, realistic fire drills commensurate with the type of aircraft in use at the aerodrome, and live fires drills with fuel discharge under very high pressure, training in human performance and team coordination, trained in helicopter Recuse, water recuse and dangerous Goods, training in Incident Commander or on seen Commander.

e. the aerodrome operator must demonstrate to the BDCA that said personnel have passed examinations and aptitude tests with the corresponding certifications. You must possess the personal records which must be in the RFF available when requested by the BDCA, basic and advanced life support, cardio-pulmonary resuscitation, aerodrome operator must demonstrate to the BDCA that said personnel has passed exams and aptitude tests.

f. The personnel that carries out operative tasks in the RFF of an aerodrome, must be graduated from the Aeronautical Technical School, with the title of Higher-level Technician in Safety Rescue and Fire Extinction.

g. The personnel assigned to the RFF service must demonstrate a good psychophysiological condition that allows them to exercise their functions in an unlimited way, considering the great physical effort required.

h. The aerodrome operator must provide all RFF personnel and other authorized personnel with suitable uniforms and corresponding identification.

i. At international airports, at least one member of the RFF service on duty should have a reasonable command of the Spanish language to facilitate communication with the flight crew and survivors of the accident.

j. If it is deemed necessary to assign other functions to the RFF, during its working hours, the aerodrome operator or service provider responsible / or the officer in charge of the RFF must ensure that they do not affect the availability and capacity to respond to the emergency, nor hinder its essential activity of instruction, inspections and equipment maintenance.

2. Personal Protection Equipment.

a. All personnel involved in rescue and firefighting operations of an aircraft must be equipped with personal protective clothing and respiratory equipment and respiratory so that they can safely perform the functions entrusted to them.

b. The aerodrome operator or service provider responsible or Officer in charge of RFF must provide each RFFstaff withpersonal protective clothing, as well as sufficient respiratory equipment protection (See Section 3 of this chapter) for the allocation of each shift, that must be kept and available for immediate use, in case of an emergency.

All Fire Fighters shall be provided with individual protective clothing. These items of protective clothing are;

- protective helmet complete with visor
- bunker suits Jacket and Trousers
- proximity suits Jacket and Trousers
- Firefighting gloves
- Firefighting boots, and
- Firefighting mask

3. Respiratory Protection Equipment.

a. Firefighters who in an accident / incident have to enter an environment contaminated with smoke or other toxic products must be equipped with the appropriate respiratory equipment, which must have the approval of the governmental or non-governmental body designated by the state and must be maintained in force and demonstrated to the BDCA when it requests it..

b. The respiratory protection equipment must be:

c. Autonomous.

d. Suitable for performing its basic function of respiratory support and durable for the required jobs.

e. The respiratory protection team must additionally have a security system that alerts in case of detecting lack of movement (as in case of fading) on the fireman who uses it, known as "dead man" or PASS in its acronym in English (Personal Alert Safety System).

f. Personnel who employ respiratory protection equipment must be adequately trained with the appropriate means and competent instructors to ensure initial and recurrent training. Said training must be included in the Instruction Program.

g. The appropriate means to recharge the cylinders with air It must be provided, also having spare cylinders in order for the equipment to always be available.

h. The aerodrome operator must have a Program of Inspection and Maintenance for Respiratory Protection Equipment which must be available to the inspectors of the BDCA.

Part 3.RFF FIRE STATION

1. Site

a. The RFF Fire Station shall be located, so as to ensure compliance with the expected response time.

b. When it is not possible to achieve the response time with a single RFF Fire Station, "satellite" headquarters should be built.

c. The location of the RFF Fire Stations should allow the rescue and fire fighting vehicles to have immediate access to the movement area, be able to reach the ends of this area within the response time established in BCAR 139 and have designed routes and marked in such a way that the access to the emergency is as direct as possible.

d. The RFF Fire Station must have a watch room which shall be located in such a way as to provide the widest possible vision of the movement area..

e. When the RFF station does not have a view of the sectors furthest from the movement area, a watch tower or a closed-circuit television (CCTV) should be installed.

f. When a new RFF station is to be installed, the aerodrome operator must perform response tests on RFF vehicles in order to determine the optimal location in relation to potential accident locations.

g. Plans for the future expansion of the airport should be taken into account, as these can increase the distances to be travelled in case of intervention.

h. All RFF Fire Station must have emergency access roads which are adequate and allow safe and fast access to the movement area and to the possible accident zones of the aerodrome and outside them. This condition must be taken into account when determining the location of the RFF Fire Stations.

2. Characteristics

a. The Fire Station of an airport must constitute an autonomous unit, which meets the necessary conditions to protect the vehicles, brigades and operational services that are considered necessary, and allow an immediate and effective response in case of emergency.

b. The area designated to house the vehicles must meet the necessary conditions to protect and house firefighting vehicles, ambulances, special vehicles, multipurpose vehicles, among others; and additionally, allow to carry out the current (minor) maintenance operations and have appropriate lighting.

c. The parking of the vehicles must be done in such a way that the failure of one of them does not prevent the departure of the other vehicles.

d. The floor should slope toward the doors, where a drain should be installed to allow water to run off the surface of the RFF Fire Station.

e. The doors must be operated manually or by an automatic device, if possible, with remote control, from the watch room or together with the operation of the alarm bells. A system that allows manual operation should be provided in case the automatic device fails.

f. The doors of the premises for the vehicles must be of fast action and reduced robustness in their construction, in order to allow that they do not cause damages to the vehicles in their race towards the emergency before a failure of the opening system. So, they must also have windows that allow adequate natural light.

g. The RFF Fire Station must have administrative facilities, dormitories (male and female staff), kitchen, dining room, locker room and restrooms for staff, classrooms, spaces for physical training, practice areas, areas for the communications centre.

h. It must have communications and alarm systems that provide liaison with air traffic and security services, which, in case of emergency, guarantee the immediate and effective deployment of vehicles.

i. All RFF Fire Station must have a water supply station, which allows quick supply and recharge of the units.

j. All RFF Fire station must have an area for adequate storage of reserve supplies, which must ensure that the appropriate storage and preservation conditions of the different elements are maintained, as well as that they have appropriate security measures and with the due access for the recharging of vehicles.

Part 4 – TRAINING

1. General

a. The aerodrome operator must implement and develop a training program, and an annual training and instruction plan, to provide RFF service personnel with the necessary physical and technical training to efficiently carry out rescue and firefighting operations on aircraft. operation, maintenance and inspection of portable and rolling extinguishers, equipment, tools and vehicles for firefighting.

b. The instruction must be done using standardized didactic material accepted by the BDCA and the training, which may be face-to-face or blended, must include at least instruction related to human performance, understanding in the operation of equipment and coordination for emergency care, specializations and recurrences according to the program of instruction that is established.

c. All rescue and firefighting personnel must be properly trained to perform their duties efficiently and must participate in real firefighting exercises that correspond to the types of aircraft and the type of rescue and firefighting equipment that is used at the aerodrome, including fires fed by pressurized fuel.

d. The aerodrome operator must maintain individualized and updated records of training for each RFF staff, which must be available to the BDCA when requested.

e. The practices or drills must be done according to a program established in the Emergency Plan, previously accepted and coordinated with the BDCA.

2. Training Curriculum.

f. Training of rescue and firefighting personnel falls into two extensive categories:

(1) Initial Training - in the use and maintenance of equipment, and operational tactics training which covers the development of personnel and equipment to accomplish control of fire to permit rescue operations to proceed.

(2) Structured Learning Program - should be initiated on completion of the initial training course. All personnel regardless of previous applicable experience, on or off the aerodrome should participate.

Practical training

Each RFF unit should have access to a training ground or training area on their aerodrome at a location that does not compromise their response time. The area identified should be able to accommodate practical operational training activities such as:

- realistic fire drills commensurate with the types of aircraft in use at the aerodrome
- live fires associated with fuel discharge under very high pressure(requirement to be determined at local level)
- drills to maintain operational performance with fire service equipment
- training to include human performance and team coordination
- breathing apparatus training in heat and or smoke

g. The training curriculum for RFF service personnel should include Basic and refresher training that covers at least the following aspects:

1. Familiarization with the Aerodrome.
2. Familiarization with aircraft and systems.
3. Safety of Rescue and Fire Fighting Personnel.
4. Aerodrome emergency communications systems, including alarms related to aircraft fires.
5. Aerodrome fire rescue and firefighting equipment and tools.
6. Fire Extinguishing Agents and Combustion Chemistry.
7. Assistance for the evacuation of emergencies in aircraft.
8. Protective clothing and respiratory protection equipment.
9. Adaptation and use of the equipment of structural fire brigades for the rescue and extinction of fires in aircraft.
10. Operations with the Rescue vehicle and fire extinguishing.
11. Fire Extinguishing Operations in Aircraft.
12. Aerodrome emergency plan.
13. Human Factor.
14. Practices with real fire drills and pressure fed fire.
15. Basic and Advanced Life Support and CPR.
16. Emergency response with dangerous goods.
17. Helicopter rescues and Fire Fighting
18. Water Rescue
19. Incident commander or onscreen Commander

h. The training plan must be submitted to the BDCA, for its evaluation and subsequent approval / acceptance, prior to its implementation and subject to periodic reviews as required by that Authority. All the personnel has to be trained in the detailed procedures indicated in Part 5

3. Training records standard

RFF personnel training records shall have a uniform standard in structure and arrangement as follows:

a. Each firefighter must have an individual and unique record with his/her name and photograph on the front page.
b. The record shall be placed in chronological order with the previous trainings first so that the most recent ones are on the first pages.
c. The record must have a section separated by a tab where the training in real fire and simulator pressure-fed fuel, are located.
d. On the back front page shall be a table with the entire approved/accepted by the BDCA training programme where the respective course is indicated in the first column and in the first row the year in which the training was received in order to quickly verify the whole training of each firefighter.

Part 5 – RESCUE AND FIREFIGHTING PROCEDURES.

1. General

a. The RFF service must have a Manual of Rescue and Fire Fighting Procedures, which must be submitted acceptance by the BDCA-

b. The Manual must describe the organization of the RFF service of the aerodrome, for which it will designate a person responsible for the service.

c. In addition, the RFF Procedures Manual should include procedures to act, at a minimum, on the following types of emergencies:

1. Emergency Evacuation.
2. Location of RFF Service.
3. Rescue and Firefighting operations.
4. Fuel spills.
5. Aircraft with landing gear problems.
6. Aircraft with hydraulic problems.
7. Overheated brakes and fires in the brake system.
8. Aircraft with engine problems.
9. Aircraft with problems in the cabin.
10. Emergencies with military aircraft (when applicable).
11. Acts of unlawful interference.
12. Emergencies with Helicopters.
13. Structural fires.
14. Emergencies related to Dangerous Goods.
15. Preservation of the scene of the accident.

d. The Rescue and Firefighting Procedures Manual must be correlated with the provisions of the Aerodrome Emergency Plan.

Part 6 - Rescue Operations in Difficult Environments

1. General

a. At aerodromes where a considerable proportion of aircraft arrivals and departures take place over stretches of water, wetlands or other varieties of difficult terrain in the immediate vicinity of the airport, and where conventional rescue and firefighting vehicles cannot provide an effective response, the aerodrome operator must have procedures to deal with the accidents that occur in those places, which must be acceptable to the BDCA.

b. The aerodrome operator must determine and specify in advance to the BDCA the area of action with respect to which it undertakes to provide rescue services.

c. The operation objectives must allow to create conditions in which survival is possible and to carry out the total Rescue operation successfully.

d. The magnitude of the rescue equipment must be related to the capacity of the larger aircraft that uses the airport.

e. Difficult terrain types, for which special equipment may be needed, are:

   1. the sea and other significant stretches of water adjacent to the airport;
   2. the marshes or similar surfaces, especially the creeks of the rivers that have tide;
   3. mountainous areas;

f. In all situations, the aerodrome operator must have the following basic equipment:

   1. communications equipment, which may also include the visual signal equipment. Ideally, the use of a transmitter in the distress frequency provides liaison with the air traffic control and the emergency operations centre;
   2. navigation aids;
   3. first aid medical kit;
   4. life-saving equipment, including life jackets when dealing with mishaps occurring in the water, tents, waterproof blankets, Rescue Blankets, and drinking water;
   5. lighting equipment;
   6. ropes, hooks for boats, megaphones and tools; for example, pliers to cut wires and knives to cut the seat belts.

2. Mutual aid emergency agreements

In developing an AEP and the water rescue service at aerodromes, consideration shall be given to public services (such as military search and rescue units, harbour police, or fire departments) and private rescue services (such as National Emergency Management Organisation (NEMO), rescue squads, power and communication companies, field or shipping and waterway operators, ambulances service, Ministry of Health), that may be available and are capable of rendering assistance. A signal system for alerting private or public services in time of emergency should be prearranged. The following should be considered:

(a) The close proximity of an airport to surrounding communities and the possibility of an off airport aircraft accident give rise to the need for mutual aid emergency agreements.

(b) A mutual aid emergency agreement shall specify initial notification and response assignments. It should not specify the responsibilities of the agency concerned as this will be contained in the AEP.

(c) Mutual aid emergency agreements shall be prearranged and duly authorized. The airport authority may have to act as coordinating agency if more complicated jurisdictional or multi-agency agreements are necessary.

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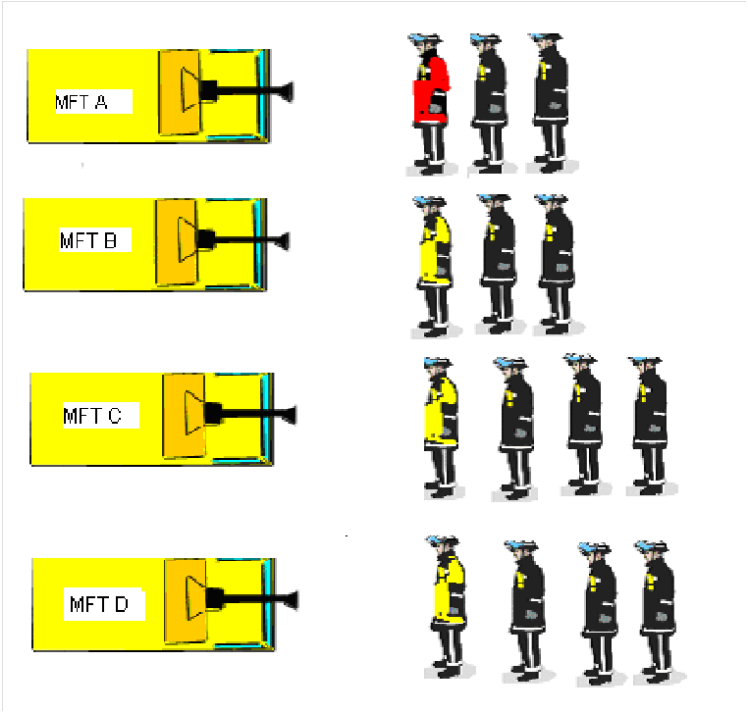
APPENDIX 1 - Minimum Quantities of Equipment / Vehicles and personnel on board the major Foam Tender (MFTs)



MFT – Foam Extinguishing Vehicle

COMMENTS:

Comments about this Advisory Circular, please send them to the Aerodromes Certification and Surveillance Department of the BDCA.

ANNEXES

Aircraft categories

Table 1 provides guidance to the types of aircraft with its respective category. The aerodrome category will be determined after considering the nature, size and frequency of aircraft movements.

Airport Category	Airplane Type	Overall Fuselage Length(m) *0 = L< 9*	Maximum Fuselage Width(m) *W ≤ 2*
Category 1	Cessna 172 Skyhawk	8.2	1.0*
	Cessna 182 Skylane	8.84	1.07*
	Cessna 185 Skywagon	7.8	1.12*
	Piper Cherokee 6 PA32	8.44	1.3*
	Piper Seneca PA34	8.7	1.3*

Airport Category	Airplane Type	Overall Fuselage length(m) **18 ≤ L < 24**	Maximum Fuselage Width(m) **W ≤ 4**
Category 2	Cessna 206G Stationair	8.6	2.3
	Cessna 207A Skywagon	9.68	2.3
	Cessna 421 Golden Eagle	11.09	1.4
	Cessna Caravan 675 & 208	11.5	1.27
	Beech King Air C90B	10.8	1.37
	Britten Norman Islander BN2 & BN2A	10.86	1.09
	Piper Aztec PA23	250	9.5
	Piper Chieftain PA31 350	10.6	1.27*

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	Beech King Air C90B	10.8	1.37
	Britten Norman Islander BN2 & BN2A	10.86	1.09
	Piper Aztec PA23	250	9.5
	Piper Chieftain PA31 350	10.6	1.27*

Airport Category	Airplane Type	Overall Fuselage length(m) ***28 ≤ L< 39***	Maximum Fuselage Width(m) ***W ≤ 5***
Category 6	Airbus A318	31.44	3.96
	Airbus A319	33.84	3.96
	Airbus A320	37.57	3.96
	Boeing 737 300	33.4	3.76
	Boeing 737 700	33.6	3.76
	Bombardier Global Express	30.3	2.69
	De Havilland Dash 8 DHC-8 400	30.48	2.69
	Grumman Gulfstream GIV	29.4	2.68*
Airport Category	**Airplane Type**	**Overall Fuselage length(m)** ***39 ≤ L< 49***	**Maximum Fuselage Width(m)** ***W ≤ 5***
Category 7	Airbus A321	44.51	3.96
	Boeing 737 800	39.5	3.76
	Boeing 757 200	47.32	3.7
	Boeing 767 200	48.5	4.7
Airport Category	**Airplane Type**	**Overall Fuselage length(m)** ***39 ≤ L< 49***	**Maximum Fuselage Width(m)** ***W ≤ 5***
Category 8	Airbus A300 600	54.1	5.64
	Airbus A310 300	46.66	5.64
	Airbus A330 200	59.0	5.64
	Airbus A340 200	46.06	5.64