

**AIRPORT STANDARDS DIRECTIVE 702**

**[ASD 702]**

**RESCUE AND FIRE FIGHTING**



**AIRPORT STANDARDS DIVISION  
DEPARTMENT OF CIVIL AVIATION  
MALAYSIA**

**This Airport Standards Directive is published and enforced by the Director General of Civil Aviation Malaysia under the provision of the Section 240 Civil Aviation Act 1969 (Act3) – Amendment 2006.**

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## **INTRODUCTION**

1. In exercise of the powers conferred by regulation 33(1) & (2) of the Civil Aviation (Aerodrome Operations) Regulations 2016, the Director General makes this Airport Standards Directive.
2. This Airport Standards Directive is published by the Director General under section 24O of Civil Aviation Act 1969 [Act 3] – Amendment 2006.
3. The principal objective of rescue and fire fighting service is to save lives in the event of an aircraft accident or incident occurring at, or in the immediate vicinity of, and aerodrome.
4. For this reason, the provision of adequate and special means of dealing promptly with an aircraft accident or incident occurring at, or in the immediate vicinity of, an aerodrome assumes primary importance because it is in within this area that there are the greatest opportunities of saving lives.
5. The most important factors bearing on the effective rescue in a survivable aircraft accident are the training received, the effectiveness of the equipment and the speed with which personnel and equipment designated for rescue and fire fighting purposes can be put into use.
6. This Directive has been written in general terms. Specific advice could be obtained from the Authority at:

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Level 1 Block Podium B Precinct 4  
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## **OBJECTIVE**

7. This Airport Standards Directive outlines the application of provisions under the Civil Aviation Act 1969 in the form of rules, practices and specifications pertaining to fire fighting and rescue services to be made available at aerodromes and to which aerodrome operator shall be informed and obliged to comply.

## **RULES**

8. Rescue and fire fighting equipment and services shall be provided at aerodromes that accommodate public transport aircraft operations.
9. Aerodrome located close to water / swampy areas, or difficult terrain, and where a significant portion of approach or departure operations takes place over these areas, specialist rescue services and fire fighting equipment appropriate to the hazard and risk shall be made available unless such specialist rescue services are provided by other agencies.
10. The rescue and fire fighting equipment and services provided at an aerodrome, as required in this Directive, do not take into account the requirements for building or fuel farm fires.

## **AERODROME CATEGORY**

11. The aerodrome category shall be determined based on the longest aircraft normally using the aerodrome and their fuselage width.

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<b>Aerodrome Category</b>	<b>Aircraft over-all length</b>	<b>Maximum Fuselage Width</b>
1	0 m up to but not including 9 m	2 m
2	9 m up to but not including 12 m	2 m
3	12 m up to but not including 18 m	3 m
4	18 m up to but not including 24 m	4 m
5	24 m up to but not including 28 m	4 m
6	28 m up to but not including 39 m	5 m
7	39 m up to but not including 49 m	5 m
8	49 m up to but not including 61 m	7 m
9	61 m up to but not including 76 m	7 m
10	76 m up to but not including 90 m	8 m

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12. If after selecting the category appropriate to the longest aeroplane's overall length, that aeroplane's fuselage width is greater than the maximum width for that category, then the category for that aeroplane shall actually be one category higher.

### **LEVEL OF PROTECTION**

13. The level of protection provided at an aerodrome for rescue and fire fighting shall be equal to the aerodrome category.
14. During anticipated periods of reduced activity, the level of protection available shall be no less than that needed for the highest category of aeroplane planned to use the aerodrome during that time irrespective of the number of movements.

### **EXTINGUISHING AGENTS**

15. Both principal and complementary agents shall be provided at an aerodrome.
16. Principal Extinguishing Agents
  - 16.1 The principal extinguishing agent shall be –
    - i. a foam meeting the minimum performance level A; or
    - ii. a foam meeting the minimum performance level B; or
    - iii. a foam meeting the minimum performance level C; or
    - iv. a combination of these agents.

16.2 The amounts of water for foam production to be provided on the fire fighting and rescue vehicles shall be in accordance with the aerodrome category, as follows –

Aerodrome category	Foam meeting performance level A		Foam meeting performance level B		Foam meeting performance level C		Complementary agents	
	Water (L)	Discharge rate foam solution/minute (L)	Water (L)	Discharge rate foam solution/minute (L)	Water (L)	Discharge rate foam solution/minute (L)	Dry chemical powders (kg)	Discharge Rate (kg/second)
		(3)		(5)		(7)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	350	350	230	230	160	160	145	2.25
2	1 000	800	670	550	460	360	190	2.25
3	1 800	1 300	1 200	900	820	630	135	2.25
4	3 600	2 600	2 400	1 800	1 700	1 100	135	2.25
5	8 100	4 500	5 400	3 000	3 900	2 200	180	2.25
6	11 800	6 000	7 900	4 000	5 800	2 900	225	2.25
7	18 200	7 900	12 100	5 300	8 800	3 800	225	2.25
8	27 300	10 800	18 200	7 200	12 800	5 100	450	4.5
9	36 400	13 500	24 300	9 000	17 100	6 300	450	4.5
10	48 200	16 600	32 300	11 200	22 800	7 900	450	4.5

*Note.— The quantities of water shown in columns 2, 4 and 6 are based on the average overall length of aeroplanes in a given category.*

16.3 At aerodromes where operations by aeroplanes larger than the average size in a given category are planned, the quantities of water should be recalculated and the amount of water for foam production and the discharge rates for foam solution should be increased accordingly.

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

16.5 When a combination of different performance level foams are provided at an aerodrome, the total amount of water to be provided for foam production should be calculated for each foam type and the distribution of these quantities shall be documented for each vehicle and applied to the overall rescue and fire fighting requirement.

16.6 The amounts of water for foam production to be provided on the rescue and fire fighting vehicles, as stated above, may be modified as follows –

- i. for aerodromes categories 1 and 2 up to 100% of the water may be replaced by complementary agent; or
- ii. for aerodromes categories 3 to 10, when foam meeting performance level A is used, up to 30% of the water may be replaced by complementary agent.

16.7 For the purpose of agent substitution, as allowed in para 16.5, the following equivalent shall be used –

1 kg complementary agent = 1.0 l water for production of a foam meeting performance level A

1 kg complementary agent = 0.66 l water for production of a foam meeting performance level B

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

16.9 The quantity of foam concentrates provided on a vehicle should be sufficient to produce at least two loads of foam solution.

16.10 The discharge rate of the foam solution shall not be less than that specified in para 16.2.

16.11 A reserve supply of foam concentrates equivalent to 200 per cent of the quantities of these agents to be provided in the rescue and fire fighting vehicles should be maintained on the aerodrome for vehicle replenishment purposes.

16.12 Supplementary water supplies, for the expeditious replenishment of rescue and fire fighting vehicles at the scene of an aircraft accident, should be provided.

## 17. Complementary Extinguishing Agent

17.1 The complementary extinguishing agent should be a dry chemical powder suitable for extinguishing hydrocarbon fires.

17.2 The amounts of complementary agents to be provided on the fire fighting and rescue vehicles shall be in accordance with the aerodrome category, as follows in Para 16.2

17.3 The complementary agents shall comply with the appropriate specifications of the International Organization of Standardization [ISO].

17.4 The discharge rate for complementary agents should not be less than that specified in Para 16.2

17.5 A reserve supply of complementary agent equivalent to 200 per cent of the quantities of these agents to be provided in the fire fighting and rescue vehicles should be maintained on the aerodrome for vehicle replenishment purposes.

**NUMBER OF FIRE FIGHTING AND RESCUE VEHICLES**

18. The minimum number of rescue and fire fighting vehicles that shall be provided at an aerodrome are as follows -

Aerodrome Category	Fire Fighting Rescue vehicles
1	1
2	1
3	1
4	1
5	1
6	2
7	2
8	3
9	3
10	3

**RESPONSE TIME**

19. The operational objective of the rescue and fire fighting service shall to achieve a response time not exceeding three minutes –

- i. to any point of each operational runway; and
- ii. to any other part of the movement area.

- in optimum visibility and surface conditions defined as daytime, good visibility, no precipitation with the normal response route free of contamination.

20. The response time is the time between the initial call to the rescue and fire fighting service, and the time when the first responding vehicle[s] is [are] in the position to apply foam at a rate of at least 50% of the discharge rate specified in para 16.2

21. Any other vehicles required to deliver the amounts of extinguishing agents specified in para 16.2 and para 17.2 shall arrive no more than one minute after the first responding vehicle[s] so as to provide continuous extinguishing agent application.
22. A system of preventive maintenance of rescue and fire fighting vehicles should be employed to ensure effectiveness of the equipment and compliance with the specified response time throughout the life of the vehicle.

### **EMERGENCY ACCESS ROAD**

23. Emergency access roads should be provided on an aerodrome, where terrain conditions permit their construction, so as to facilitate achieving the minimum response time.
24. Emergency access roads should be capable of supporting the heaviest vehicles which will use them and be usable in all weather conditions.
25. Particular attention should be given to the provision of ready access to approach areas up to 1000 meters from the threshold or at least the aerodrome boundary. Where a fence is provided, the need for convenient access to outside areas should be taken into account.

### **RESCUE EQUIPMENTS**

26. Rescue equipments commensurate with the level of aircraft operations should be provided on rescue and fire fighting vehicle[s].

### **FIRE STATION**

27. The fire station should be located so that the access for rescue and fire fighting vehicles into the runway area is direct and clear and requiring a minimum number of turns.
28. Satellite fire station should be provided whenever the required response time cannot be achieved from a single fire station.

## **COMMUNICATION AND ALERTING SYSTEM**

29. A discrete communication system should be provided linking a fire station with the aerodrome control tower, any other fire station on the aerodrome and the fire fighting and rescue vehicles.
30. An alerting system for fire fighting and rescue personnel, capable of being operated from that station, should be provided at a fire station, any other fire station on the aerodrome and the aerodrome control tower.

## **PERSONNEL**

31. A fire fighting and rescue personnel training programme shall be established. The programme shall include training in human performance including team coordination.
32. All fire fighting and rescue personnel shall be properly trained to perform their duties in an efficient manner.
33. All fire fighting and rescue personnel shall participate in live drills commensurate with the types of aircraft and the type of fire fighting and rescue equipment in use at the aerodrome, including pressure-fed fuel fires.
34. Sufficient trained fire fighting and rescue personnel shall be detailed and be readily available to ride the fire fighting and rescue vehicles and to operate the equipment at maximum capacity.
35. Sufficient trained fire fighting and rescue personnel shall be deployed in a way –
  - i. that ensures the minimum response time can be achieved;
  - ii. that continuous agent application at the appropriate rate can be fully maintained; and
  - iii. that ensures efficient use of hand lines, ladders and other equipment normally associated with aircraft fire fighting and rescue operations.
36. The number of personnel required to provide for rescue should consider the largest type of aircraft operating at the aerodrome.

37. All responding fire fighting and rescue personnel shall be provided with protective clothing and respiratory equipment to enable them to perform their duties in an effective manner.

## **DEVIATIONS**

38. The Department of Civil Aviation shall notify and publish deviations from any Standards and Recommended Practices contained in ICAO Annex 14 in the Aeronautical Information Services publications in compliance to the Article 38 of the Convention on International Civil Aviation.

**DATO' SRI AZHARUDDIN ABDUL RAHMAN**  
**Director General**  
**Department of Civil Aviation**  
**Malaysia**

**Dated : 26 APRIL 2016**