Annex to Decision 2016/009/R

'Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Authority, Organisation and Operations Requirements for Aerodromes — Amendment 1'

The Annex to Decision 2014/012/R[1] is hereby amended as follows:

The text of the amendment is arranged to show deleted, new or amended text, as shown below:

(a) deleted text is marked with ~~strike through~~;

(b) new or amended text is highlighted in grey; and

(c) an ellipsis (…) indicates that the remaining text is unchanged in front of or following the reflected amendment.

1. GM1 ADR.OPS.B.010(a)(1) has been amended as follows:

GM1 ADR.OPS.B.010(a)(1) Rescue and firefighting services

AVAILABILITY AND SCOPE OF RESCUE AND FIREFIGHTING SERVICES

Public or private organisations, suitably located and equipped, could be designated to provide the rescue and firefighting service. The fire station housing these organisations should normally be located on the aerodrome, although an off-aerodrome location is not precluded, provided that the response time can be met. The ~~scope of the~~ principal objective of rescue and firefighting services is to save lives in the event of an aircraft accident or incident occurring at, or in the immediate surroundings of, the aerodrome. The ~~operational objective~~ rescue and firefighting service is provided ~~is~~ to create and maintain survivable conditions, to provide egress routes for occupants ,and to initiate the rescue of those occupants unable to make their escape without direct aid. The rescue may require the use of equipment and personnel other than those assessed primarily for rescue and firefighting purposes. Ambulance and medical services are out of the scope of rescue and firefighting services as described in ADR.OPS.B.010. The role and responsibilities of ambulance and medical services during an emergency situation should be included in the aerodrome emergency plan (AEP), according to GM3 ADR.OPS.B.005(a).

2. AMC2 ADR.OPS.B.010(a)(2) has been amended as follows:

AMC2 ADR.OPS.B.010(a)(2) Rescue and firefighting services

RFFS LEVEL OF PROTECTION

(a) The aerodrome operator should ensure that:

(…)

(2) the ~~RFF~~ aerodrome category for rescue and firefighting is determined according to ~~the~~ Table 1, based on the longest aeroplanes normally using the aerodrome and their fuselage width. If, after selecting the category appropriate to the longest aeroplane's overall length, that aeroplane's fuselage width is greater than the maximum width in Table 1, column 3, for that category, then the category for that aeroplane should actually be one category higher.

[1] Decision 2014/012/R of the Executive Director of the Agency of 27 February 2014 adopting Acceptable Means of Compliance and Guidance Material to Regulation (EU) No 139/2014 'AMC/GM for Aerodromes — Initial Issue'

Aerodrome category for rescue and firefighting		
Aerodrome category (1)	Aeroplane overall length (2)	Maximum fuselage width (3)
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

(3) the rescue and firefighting level of protection provided is appropriate to the aerodrome category determined using the principles in (2) above except that where the number of movements (landing or take-off) of the aeroplanes performing passenger transportation in the highest category, normally using the aerodrome, is less than 700 in the busiest consecutive three months, the level of protection provided in accordance with (2) above may be reduced by no more than one category below the determined one.

(b) Notwithstanding (a),~~The~~ the aerodrome operator may, ~~should ensure that~~ during anticipated periods of reduced activity (e.g. specific periods of the year or day), reduce the rescue and firefighting level of protection available at the aerodrome. In this case:

(1) the level of protection ~~is~~ should 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~~.~~; and

(2) the periods of aerodrome operation with reduced rescue and firefighting level of protection should be published in the aeronautical information publication (AIP) or through notice to airmen (NOTAM).

(c) ~~Reduction of the level of protection for rescue and firefighting as determined in accordance with Table 1, may be accepted by the Competent Authority.~~ The level of protection required for all-cargo, mail, ferry, training, test, positioning and end-of-life aeroplane operations, including those carrying dangerous goods, irrespective of the number of movements, may be reduced in accordance with Table 2 as follows:

Aerodrome category	RFF level of protection required
1	1
2	2
3	3
4	4
5	5
6	5
7	6
8	6
9	7
10	7

Table 2

(d) The aerodrome operator, in order to assess whether the rescue and firefighting level of protection to be provided at the aerodrome is appropriate to the aerodrome rescue and firefighting category, should, at least annually, forecast the aeroplane traffic expected to operate at the aerodrome for the next twelve-month period. Upon knowledge of planned changes to traffic volume and structure, additional assessments might be necessary. In doing so, the aerodrome operator may use all information available from aeroplane operators as well as statistics on aeroplane movements during the year preceding the day of review.

(e) Unforeseen circumstances leading to temporary reduction of the aerodrome rescue and firefighting level of protection are considered as unplanned events that result in unavailability of facilities, equipment and resources.

(f) For emergency landings and occasions when in the pilot's-in-command opinion, a diversion or hold may create a more significant hazard, operation of aeroplanes whose required category is higher than the level of protection provided by the aerodrome should be permitted regardless of the rescue and firefighting level of protection available.

3. AMC3 ADR.OPS.B.010(a)(2) has been amended as follows:

AMC3 ADR.OPS.B.010(a)(2) Rescue and firefighting services

NUMBER OF RFFS VEHICLES AND RESCUE EQUIPMENT

(a) The aerodrome operator should ensure that:

(1) the minimum number of rescue and firefighting vehicles at the aerodrome to effectively deliver and deploy the agents specified for the aerodrome category will be in accordance with the following table; and

(…)

4. AMC4 ADR.OPS.B.010(a)(2) has been amended as follows:

AMC4 ADR.OPS.B.010(a)(2) Rescue and firefighting services

EXTINGUISHING AGENTS

The aerodrome operator should ensure that:

(a) both principal and complementary extinguishing agents are provided at the aerodrome;

(…)

(da) the quantity of foam concentrates separately provided on vehicles for foam production is in proportion to the quantity of water provided and the foam concentrate selected;

(…)

(k) a reserve supply of complementary agent equivalent to 100% of the quantity identified in Table 1 is maintained on the aerodrome for vehicle replenishment purposes and sufficient propellant gas is included to utilize this reserve complementary agent~~;~~ .Complementary agent(s) carried on fire vehicles in excess of the quantity identified in Table 1 may contribute to the reserve;

(…)

(o) quantities of water and foam concentrate are recalculated and the amount of water and foam concentrate for foam production and the discharge rates for foam solution are increased accordingly, where operations by aeroplanes larger than the average size in a given category are planned; ~~and~~

(oa) Where the level of protection is reduced in accordance with AMC2 ADR.OPS.B.010 (a)(2), a recalculation of quantities of extinguishing agents should be computed based on the largest aeroplane in the reduced category;

(ob) For all-cargo, mail, training, test, positioning and end-of-life aeroplane operations, including those carrying dangerous goods, the recalculation of quantities of extinguishing agents should be based on the largest aeroplane in the category specified in Table 2 of AMC2 ADR.OPS.B.010(a)(2);and

(…)

5. AMC5 ADR.OPS.B.010(a)(2) has been amended as follows:

AMC5 ADR.OPS.B.010(a)(2) Rescue and firefighting services

RESPONSE TIME

The aerodrome operator should ensure that:

(a) rescue and firefighting service achieves a response time not exceeding three minutes with an operational objective of not exceeding two minutes from the time of the initial call to the rescue and firefighting services, to any point of each operational runway, in optimum visibility and surface conditions, and be in a position to apply foam at a rate of, at least, 50 % of the discharge rate specified in AMC4 ADR.OPS.B.010 Table 1;

(…)

6. GM4 ADR.OPS.B.010(a)(2) has been amended as follows:

GM4 ADR.OPS.B.010(a)(2) Rescue and firefighting services

REDUCTION OF RFFS ~~AERODROME CATEGORY~~ LEVEL OF PROTECTION

~~(a) The level of protection could be one category below the determined category if the number of movements of the aeroplanes in the highest RFF aerodrome category normally using the aerodrome is less than 700 in the busiest consecutive three months.~~

~~(b) The level of protection should be equal to the determined category if the number of movements of the aeroplanes in the highest RFF aerodrome category normally using the aerodrome is equal or above 700 in the busiest consecutive three months.~~

~~(c) For aerodromes serving exclusively all-cargo aircraft operations, the RFF aerodrome category could be adjusted to a category lower than the one for passenger aircraft operations, provided that the principal objective, to save lives in the event of an aircraft accident or incident, is met.~~

Contingency arrangements to limit the need for changes to the promulgated rescue and firefighting level of protection should be developed. This may involve, for example, a maintenance plan to ensure the mechanical efficiency of equipment and vehicles for rescue and firefighting, and arrangements to cover unplanned absence of the minimum level of personnel including supervisory levels.

~~(d)~~ The following may be considered as ~~U~~unforeseen circumstances leading to temporary reduction of the level of protection of the aerodrome rescue and fire–fighting ~~services are considered any unplanned events that lead to unavailability of facilities, equipment, and resources, such as~~:

~~(1)~~(a) breakdown of RFFS vehicles;

~~(2)~~(b) staff shortage;

~~(3)~~(c) unavailability of extinguishing agents; and

~~(4)~~(d) RFFS response to an accident~~;~~.

~~(5)Etc.~~

Such changes, including estimated time of the reduction, should be notified without delay to the appropriate air traffic services (ATS) units and aeronautical information services (AIS) units (see GM1 ADR.OPS.A.005 Aerodrome data) to enable those units to provide the necessary information to arriving and departing aircraft.

A temporary reduction should be expressed in terms of the new category of the rescue and firefighting services available at the aerodrome. Where the temporary reduction involves resources not used to calculate the aerodrome RFF category (e.g. specialist rescue equipment for difficult environs), details should be notified. When such a temporary reduction no longer applies, the above units should be advised accordingly.

7. A new GM5 ADR.OPS.B.010(a)(2) has been added as follows:

GM5 ADR.OPS.B.010(a)(2) Rescue and firefighting services

RESCUE AND FIREFIGHTING LEVEL OF PROTECTION

The following examples are intended to illustrate the way in which the various factors to be taken into account when calculating levels of protection should be applied:

Example 1 — Wider aeroplane fuselage

If an aeroplane has a fuselage length of 47.5 m, column 2 of Table 1 in AMC2 ADR.OPS.B.010(a)(2) indicates RFF category 7. However, the example aeroplane has a fuselage width of 5.5 m, therefore, according to (a)(2) in AMC2 ADR.OPS.B.010(a)(2), the appropriate level of protection is RFF category 8.

Example 2 — Longer than average aeroplane length

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 as well as the discharge rates for foam solution should be increased accordingly. The example below is based on an aeroplane with an overall length of 48 m and a maximum fuselage width of 5 m. The quantity of water and the discharge rate of foam solution have been calculated using the ICAO critical-area concept, and increased to reflect the greater practical critical area.

Minimum useable amounts of extinguishing agents (based on the provision of foam meeting performance level B)			
Aerodrome category	Water (lt)	Discharge rate of foam solution (lt/min)	Dry chemical powder(kg)
Category 7 minimum requirement	12 100	5 300	225
Requirement following recalculation	14 113	6 163	225

Example 3 — Less than 700 movements in the busiest consecutive 3 months

The following examples illustrate the method for the determination of the aerodrome's rescue and firefighting level of protection when considering the number of movements:

Aeroplane	**Overall length**	**Fuselage width**	**Category**	**Movements**
Airbus A320	37.6 m	4.0 m	6	600
Bombardier CRJ 900	36.4 m	2.7 m	6	300
Embraer 190	36.2 m	3.0 m	6	500
ATR 72	27.2 m	2.8 m	5	200

The longest aeroplanes are categorised by evaluating, based on Table 1 of AMC2 ADR.OPS.B.010(a)(2), firstly their overall length and secondly their fuselage width until 700 movements are reached. It may be seen that the number of movements of the longest aeroplanes in the highest category totals more than 700. The aerodrome, in this case, is category 6.

Aeroplane	**Overall length**	**Fuselage width**	**Category**	**Movements**
Airbus A350-900	66.8 m	6.0 m	9	300
Boeing 747-8	76.3 m	6.5 m	10	400
Airbus A380	72.7 m	7.1 m	10	400

The longest aeroplanes are categorised by evaluating, based on Table 1 of AMC2 ADR.OPS.B.010(a)(2), firstly their overall length and secondly their fuselage width until 700 movements are reached. It may be seen that the number of movements of the longest aeroplanes in the highest category totals more than 700. It may also be noted that when evaluating the category appropriate to the overall length of Airbus A380, e.g. category 9, the category selected is actually one level higher as the aeroplane's fuselage width is greater than the maximum fuselage width for category 9. The aerodrome, in this case, is category 10.

Aeroplane	Overall length	Fuselage width	Category	Movements
Boeing 737-900ER	42.1 m	3.8 m	7	300
Bombardier CRJ 900	36.4 m	2.7 m	6	500
Airbus A319	33.8 m	4.0 m	6	300

The longest aeroplanes are categorised by evaluating, based on Table 1 of AMC2 ADR.OPS.B.010(a)(2), firstly their overall length and secondly their fuselage width until 700 movements are reached. It may be seen that the number of movements of the longest aeroplanes in the highest category totals only 300. The minimum category for the aerodrome, in this case, is be category 6, which is one category level below that of the longest aeroplane.

Aeroplane	Overall length	Fuselage width	Category	Movements
Airbus A380	73.0 m	7.1 m	10	300
Boeing 747-8	76.3 m	6.5 m	10	200
Boeing 747-400	70.7 m	6.5 m	9	300

The longest aeroplanes are categorised by evaluating, based on Table 1 of AMC2 ADR.OPS.B.010(a)(2), firstly their overall length and secondly their fuselage width until 700 movements are reached. It may be seen that the number of movements of the longest aeroplanes in the highest category totals only 500. It may also be noted that when evaluating the category appropriate to the overall length of Airbus A380, e.g. category 9, the category selected is actually one level higher as the aeroplane's fuselage width is greater than the maximum fuselage width for category 9. The minimum category for the aerodrome, in this case, is category 9, which is one category level below that of the longest aeroplane.

Aeroplane	Overall length	Fuselage width	Category	Movements
Airbus A321	44.5 m	4.0 m	7	100
Boeing 737-900ER	42.1 m	3.8 m	7	300
ATR 42	22.7 m	2.9 m	4	500

The longest aeroplanes are categorised by evaluating, based on Table 1 of AMC2 ADR.OPS.B.010(a)(2), firstly their overall length and secondly their fuselage width until 700 movements are reached. It may be seen that the number of movements of the longest aeroplanes in the highest category totals only 400. The minimum category for the aerodrome is category 6. However, even if there is a relatively wide range of difference between the length of the longest aeroplane (Airbus A321) and the aeroplane for which the 700th movement is reached (ATR 42), the minimum category for the aerodrome may only be downgraded to category 6.

Example 4 — Anticipated periods of reduced activity

The level of protection should be no less than that needed for the highest category of aeroplanes planned to use the aerodrome during that period. If the aerodrome has promulgated RFFS category 7, but between 23:00 and 6:00, the largest aeroplane operating has an overall length of 27.5 m and a maximum fuselage width of 3.9 m, the promulgated category may be downgraded to category 5 for that time frame.

Example 5 — All-cargo and mail aeroplane operations including dangerous goods

An all-cargo aeroplane is an aeroplane operated for the transportation of cargo including dangerous goods. If an all-cargo aeroplane has an overall length of 47.5 m and a maximum fuselage width of 4.2 m, according to Table 1, category 7 is indicated. As the aeroplane is an all-cargo one, according to Table 2, a reclassification to category 6 may be applied.

8. A new GM6 ADR.OPS.B.010(a)(2) has been added as follows:

GM6 ADR.OPS.B.010(a)(2) Rescue and firefighting services

CRITICAL AREA FOR CALCULATING QUANTITIES OF WATER

(a) The ICAO critical-area concept is applied for rescuing the occupants of an aeroplane. It seeks to control only that area of fire adjacent to the fuselage. The objective is to safeguard the integrity of the fuselage and maintain tolerable conditions for the occupants of the aeroplane. The size of the controlled area required to achieve this for a specific aeroplane has been determined by experimental means.

(b) There is a need to distinguish between the theoretical critical area, within which it may be necessary to control the fire, and the practical critical area, which is representative of actual aeroplane accident conditions. The theoretical critical area serves only as a means of categorising aeroplanes in terms of the magnitude of the potential fire hazard in which they may become involved. It is not intended to represent the average maximum or minimum spill fire size associated with a particular aeroplane. The theoretical critical area is a rectangle having as one dimension the overall length of the aeroplane and as the other dimension a length which varies with the fuselage's length and width.

(c) From experiments performed, it has been established that for an aeroplane with a fuselage length equal to or greater than 24 m, in wind conditions of 16–19 km/h and at right angles to the fuselage, the theoretical critical area extends from the fuselage to a distance of 24 m upwind and 6 m downwind. For smaller aeroplanes, a distance of 6 m on either side is adequate. To provide for a progressive increase in the theoretical critical area however, a transition is used when the fuselage length is between 12 and 24 m.

(d) The overall length of the aeroplane is considered appropriate for the theoretical critical area as the entire length of the aeroplane must be protected from burning. If not, the fire might burn through the skin and enter the fuselage. Moreover, other aeroplanes, such as T-tail ones, often have engines or exit points in their extended portion.

(e) The formula for the theoretical critical area A_T should be the following:

Overall length	Theoretical critical area A_T
L < 12 m	L × (12 + W)
12 m ≤ L < 18 m	L × (14 + W)

18 m ≤ L < 24 m	L × (17 + W)
L ≥ 24 m	L × (30 + W)

where 'L' is the overall length of the aeroplane, and 'W' is the maximum width of the aeroplane fuselage.

(f) In practice, it is seldom that the entire theoretical critical area is subject to fire; thus, a smaller area for which it is proposed to have firefighting capacity is referred to as the practical critical area. As a result of a statistical analysis of actual aeroplane accidents, the practical critical area A_P has been found to be approximately two thirds of the theoretical critical area A_T, or

$A_P = 0.667 \times A_T$

(g) The quantity of water for foam production should be calculated with the following formula:

$Q = Q_1 + Q_2$, where:

— 'Q' is the total water required;

— 'Q_1' is the water used to control the fire in the practical critical area; and

— 'Q_2' is the water required after control of the fire has been established, and is needed for maintaining this control and/or extinguishing the remaining fire.

(h) The water required for control of the fire in the practical critical area (Q_1) may be expressed by the following formula:

$Q_1 = A_p \times R \times T$, where:

— 'A_p' is the practical critical area;

— 'R' is the rate of application; and

— 'T' is the time of application.

(i) The amount of water required for Q_2 may not be exactly calculated as it depends on a number of variables. The factors considered to be of primary importance are:

(1) the maximum gross mass of the aeroplane;

(2) the maximum passenger capacity of the aeroplane;

(3) the maximum fuel load of the aeroplane; and

(4) previous experience (analysis of aeroplane RFF operations).

These factors, when plotted on a graph, are used to calculate the total amount of water required for each airport category. The volume of water for Q_2, as a percentage of Q_1, varies from about 0 % for category 1 aerodromes to about 190 % for a category 10 aerodrome.

(j) The relation between Q_1 and Q_2 for aeroplanes representative of each airport category is shown in the following table:

Aerodrome category	Q_2 = percentage of Q_1
1	0 %
2	27 %

3	30 %
4	58 %
5	75 %
6	100 %
7	129 %
8	152 %
9	170 %
10	190 %

9. AMC1 ADR.OPS.C.005 has been amended as follows:

AMC1 ADR.OPS.C.005 General

MAINTENANCE PROGRAMME

(…)

(e) equipment and vehicles, including those used by rescue and firefighting services, which are necessary for the safety of aerodrome operations; and

(…)