European Union Aviation Safety Agency

Task & Resources Analysis

Is it required to perform a ‘Task and Resource Analysis’ as referred to in ICAO Airport Service Manual (Doc 9137) and GM2 ADR.OPS.B.010(a)(2)?

Answer

Although the term ‘Task and Resource Analysis’ is used in GM2 ADR.OPS.B.010(a)(2), it should be considered as a generic term not linked to the ICAO Airport Service Manual, Part 1. Therefore, it is neither a certification requirement to conduct a Task and Resource analysis nor an obligation to follow the example in the ICAO documentation.

Regardless, the aerodrome operator is expected to demonstrate to the competent authority the adequacy of the staffing levels. For that, the aerodrome operator may choose any existing or established approach to determine the number of personnel (e.g. adapted from public firefighting services or structural firefighting).

However, the aerodrome operator is expected to develop a transparent approach to determine the minimum number of personnel and equipment for a credible scenario, which might be validated in further scenarios, in accordance with its published rescue and firefighting aerodrome level(s) of protection. In case of reduced aerodrome level of protection during anticipated periods (see AMC2 ADR.OPS.B.010(a)(2)(b)), an additional determination is required with a credible scenario in each of the published levels of protection.

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What considerations for determining the number of personnel are already given in the regulatory framework?

Answer

Although Regulation (EU) No 139/2014 does not contain specific considerations on the number of required rescue and firefighting services (RFFS) personnel, the existing EU regulatory framework contains different factors that may influence the number of RFFS personnel and

should be taken into account. The following four key aspects affecting the number of personnel should be considered:

- **RFFS Level of Protection** (AMC2 ADR.OPS.B.010(a)(2));
- **Core Tasks** as indicated in the scope of RFFS (GM1 ADR.OPS.B.010(a)(1));
- Comparison of **available and required resources** (AMC6 ADR.OPS.B.010(a)(2)); and
- **Human Performance** (AMC6 ADR.OPS.B.010(a)(2)).

However, the determination should always be guided by the question whether an aerodrome operator is confident with its tactics and the associated number of personnel.

GM1 ADR.OPS.B.010(a)(1) specifies that the principal objective […] is to **save lives** […]. The rescue and firefighting service is provided **to create and maintain survivable conditions**, to **provide egress routes** […] and **initiate the rescue of those occupants unable to make their escape without aid**. The rescue may […] **use equipment and personnel other than** those assessed primarily for rescue and firefighting […].

In determining the number of personnel required to provide for rescue and firefighting, a **Task and Resource Analysis** should be performed, taking into consideration the **types of aircraft** […], the available […] **vehicles and equipment** (consider: AMC3 ADR.OPS.B.010(a)(2)), and **other duties** required from RFFS personnel (GM2 ADR.OPS.B.010(a)(2)).

AMC6 ADR.OPS.B.010(a)(2) specifies that the aerodrome operator should ensure that:

- during flight operations […] **sufficient trained personnel** is detailed and readily available to **ride** […] **vehicles**, and to operate **the equipment** […];
- personnel is deployed […] considering also the **use of hand lines, ladders, and other rescue equipment** normally associated with aircraft rescue and firefighting operations; […] and
- any **other duties carried out** […] do not compromise the response […].

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How does the RFFS level of protection influence the minimum number of RFFS personnel?

Answer

The rescue and firefighting services (RFFS) level of protection reflects the size and capacity of aircraft normally using an aerodrome. Hence, it sets the overall frame when determining the

number of RFFS personnel. When aligning the number of personnel, it could either reflect the largest aircraft usually scheduled at the aerodrome or the largest type of aircraft within the published RFFS aerodrome category. Furthermore, the number of personnel usually available at an aerodrome should be sufficient to man the available vehicles associated with the RFFS level of protection and operate the equipment deemed to be required by the aerodrome operator at its maximum capacity (c.f. AMC3 ADR.OPS.B.010(a)(2) and AMC6 ADR.OPS.B.010(a)(2)).

In addition to the RFFS level of protection, the potential existence of difficult environments at or near the aerodrome may impact the number of RFFS personnel, as a response to such areas is to be initiated and the effective deployment of rescue equipment for such areas is to be considered.

To determine the minimum number of RFFS personnel, the aerodrome operator should develop a credible scenario in accordance with its published RRFS level(s) of protection.

Possible factors taken into account		**Example Scenario #1**	**Example Scenario #2**
Flight Phase	Landing / Take-Off / Taxiing / On Stand	Landing	On Stand
Prior Alert	Yes / No	No	Yes
Number of Aircraft / Vehicles involved	Aircraft / Ground Service Equipment / Regular Vehicle	1 Aircraft	1 Aircraft
Type of Aircraft	According to Airport RFFS Category or Reference Aircraft	RFFS Aerodrome Category	(Reference) Aircraft Type
Number of Persons on Board	According to Airport RFFS Category or Reference Aircraft	Maximum Capacity of Reference Aircraft	Actual Capacity of Reference Aircraft
Passengers with Reduced Mobility	Yes / No	No	Yes
Quantity of Fuel on Board	Low (e.g., on arrival) / Full (e.g., on departure) / Unknown	Low	Unknown
Dangerous Goods	Yes / No / Types and Quantities	No	No
Location of Accident	Runway / Before or After Threshold / Taxiway / Aprons	Runway	Taxiway
Conditions at Location	Paved / Unpaved / Water or swampy Area	Paved	Unpaved
Weather Conditions	Optimal / Impacting …	Optimal	Optimal

Aircraft Emergency State	Aircraft Accident / Full Emergency / Local Standby	Full Emergency	Aircraft Accident
Fuselage Integrity	OK / Damaged / In Several Parts	Damaged	OK
Access to Fuselage	Normal / Partial / Difficult	Partial	Normal
Emergency Evacuation	< 90 sec / < 5 min / Incomplete	< 5 min	Incomplete
External Emergency Services Arrival	< 10 min / X min / 30 min …	< 30 min	25 min

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What are the core tasks that should be taken into account when determining the number of personnel for rescue and firefighting?

Answer

The determination of the number of personnel should define and prioritise tasks required to save lives as indicated in GM1 ADR.OPS.B.010 and could include:

1. **Creating survivable conditions:**
    1. manning vehicles after the initial call;
    2. responding to the accident scene;
    3. assessing the accident; and
    4. controlling external fires (mainly by foam tender's turrets).
2. **Maintaining survivable conditions:**
    1. controlling external fires (supported by hand lines); and
    2. monitoring the evacuation process.
3. **Providing egress routes**
    1. assisting the evacuation; and
    2. creating access to fuselage (e.g. with ladders, ground handling stairs or rescue stairs).
4. **Initiating rescue of trapped occupants**
    1. Initiating the egress for occupants (e.g. ventilating or accessing the fuselage); and
    2. transporting of trapped occupants out of the 'hot zone'.

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How do available resources at an aerodrome influence the number of RFFS personnel?

Answer

The aerodrome operator should not only consider the deployment of available vehicles and equipment but also and foremost their specifications and requirements, in order to deploy the vehicles and equipment effectively. The following technical factors may increase or decrease the number of rescue and firefighting services (RFFS) personnel:

1. **number, types, and seat capacity of vehicles** (cf. AMC3 ADR.OPS.B.010);
2. **number and type of potential rescue equipment** for a response to difficult environments at or adjacent to the aerodrome;
3. **technical configuration and state-of-the-art features** of vehicles and other rescue equipment available at the aerodrome; and
4. human or infrastructural capability of **effective deployment** of required rescue equipment.

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What role does human performance play in the determination of the number of personnel?

Answer

Human factors and capabilities play a major role in the overall tactics, and have hence a major impact on the response to an incident. Therefore, the following may increase or decrease the number of personnel:

1. **training and proficiency of RFFS personnel** (e.g. voluntary, part-time, or full-time firefighters);

2. **tasks other than RFFS required by core RFFS personnel, resulting in fatigue** (e.g. domestic firefighting, ground handling, or aerodrome maintenance);
3. **responsibilities and tasks conducted by non-RFFS personnel** (e.g. cabin crew, security personnel, maintenance, or state authorities); and
4. **availability and response time of rescue staff other than the aerodrome's core RFFS personnel to support during an incident** (e.g. civil defence, medical services, or other external services).

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How could the total number of RFFS personnel be calculated based on an incident-related approach?

Answer

If the transparent and documented approach to determine the number of RFFS personnel was based on a scenario, the results could be used to conclude the total number of RFFS personnel by considering the following:

1. **aerodrome infrastructure** (e.g. provision of additional capacities depending on the aerodrome specifics and to intervene at any point of the aerodrome by meeting the response time(s)); however, there is no need to duplicate each position or equipment in such case);
2. **planned absence** (e.g. recurrent training, annual leave, shift factor or shift schemes); and
3. **contingency arrangements to cover unplanned absence** (e.g. sick leave, unplanned events, vehicle breakdown (cf. GM4 ADR.OPS.B.010(a)(e)).

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Is there any further supportive material that could be useful when determining the number of required RFFS personnel?

Answer

Further guidance or considerations to determine the number of required RFFS personnel may be found in the following sources:

- ACI World: Managing Rescue and Firefighting Services at Airports — Handbook
- ICAO: Airport Services Manual, Part 1 — Rescue and Firefighting (Doc 9137)
- adapted procedures from structural firefighting or civil defense;
- contact or consultation with members of the working group for knowledge exchange; and
- any other international or national guidance material on the subject matter.

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