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AIC – Internacional
01/17
31 March

ADVISORY

TASK RESOURCES ANALYSIS FOR RESCUE AND FIRE-FIGHTING SERVICE

1. AUTHORITY

1.1. This circular is issued by the Executive Chairman of the Mozambique civil Aviation Institute (IACM) in pursuance of powers vested in him under Article 19 of Law number 05/2016 of 14 June and Article 12 of Resolution 19/2011 of 30 November.

2. GENERAL

2.1. The following guidance describes the stages that should be considered by an aerodrome operator in carrying out a Task and Resource Analysis (TRA) to establish justification as to the minimum number of qualified/competent personnel required to deliver an effective aerodrome Rescue and Fire-fighting Service to deal with an aircraft incident/accident.

3. PURPOSE

By using a qualitative risk based approach, which focuses upon probable and credible worst case scenarios a task and resource analysis seeks to identify the minimum number of personnel required to undertake identified tasks in real time before supporting external services are able to effectively assist Rescue and Fire-fighting Services.

4. REFERENCES

ICAO Doc 9137 – AN/898, Airport Services Manual, Part 1 – Rescue and Firefighting, Chapter 10 – Personnel, Item 10.5.1 to 10.5.7.6.5, Fourth Edition, 2015.

5. GENERAL INFORMATION

The aerodrome operator should first establish the minimum requirements including: minimum number of Rescue and Fire-fighting Service vehicles and equipment required

for the delivery of the extinguishing agents at the required discharge rate for the specified Rescue and Fire-fighting category of the aerodrome.

6. TASK ANALYSIS/RISK ASSESSMENT

A task analysis should primarily consist of a qualitative analysis of the Rescue and Fire-fighting Service response to a realistic, worst case, aircraft accident scenario. The purpose should be to review the current and future staffing levels of the Rescue and Fire-fighting Service deployed at the aerodrome. The qualitative analysis could be supported by a quantitative risk assessment to estimate the reduction in risk. This risk assessment could be related to the reduction in risk to passengers and aircrew from deploying additional personnel. One of the most important elements is to assess the impact of any critical tasks or pinch points identified by the qualitative analysis.

7. QUALITATIVE APPROACH

The task analysis including a workload assessment aims to identify the effectiveness of the current staffing level and to identify the level of improvement resulting from additional staffing. A credible worst-case accident scenario should be analyzed to assess the relative effectiveness of at least two levels of Rescue and Fire-fighting Service staffing.

8. QUANTITATIVE RISK ASSESSMENT

This will generally be used to support the conclusions of the qualitative analysis by examining the risks to passengers and aircrew from aircraft accidents at the airport. This comparison of the risk allows the benefit of employing additional Rescue and Fire-fighting Service staff to be evaluated in terms of the risk reduction in passengers and aircrew lives saved. This could be expressed in monetary terms and may be compared with additional costs incurred in employing the additional personnel. However, this is of little, if any, value in determining minimum levels of personnel.

9. TASK ANALYSIS

The following items will assist in determining the basic contents of an analysis:

- a. Description of aerodrome(s) including the number of runways;
- b. Rescue and Fire-fighting Service Categories;
- c. Response Time Criteria (Area, times & number of Fire Stations);
- d. Current & future types of aircraft movements;
- e. Operational Hours;
- f. Current Rescue and Fire-fighting Service Structure & Establishment;
- g. Current Level of Personnel;
- h. Level of Supervision for each operational crew;
- i. Rescue and Fire-fighting Service Qualifications/Competence (Training Programme & Facilities);

- j. Extraneous Duties (To include Domestic & First Aid Response);
- k. Communications & Alerting system including Extraneous Duties;
- l. Appliances & Extinguishing Agents available;
- m. Specialist Equipment- Fast Rescue Craft, Hovercraft, Water Carrier, Hose Layer, Extending Boom Technology;
- n. First Aid- Role Responsibility;
- o. Medical Facilities- Role Responsibility;
- p. Pre-Determined Attendance: Local Authority Services- Police, Fire & Ambulance etc.;
- q. Incident Task Analysis. (Feasible Worst Case Scenarios) (Workload Assessment) (Human Performance/Factors). To include: Mobilization, Deployment to Scene, Scene Management, Firefighting, Suppression & Extinguishment, Application of Complementary Agent(s), Post Fire Security/Control, Personnel Protective Equipment, Rescue Team(s), Aircraft Evacuation & Extinguishing Agent Replenishment. Note: The aim is to identify any Pinch Points within the current workload and proposed workload;
- r. Appraisal of existing RFFS provision;
- s. Future requirements. Aerodrome development & expansion;
- t. Enclosures could include: Airport Maps, Event Trees to explain tasks & functions conducted by the RFFS etc.);
- u. Airport Emergency Plan and Procedures.

10. PHASES:

Phase 1 - List the **aims, objectives** for the Rescue and Fire-fighting services, and the **required tasks** that personnel are expected to carry out.

Phase 2 - Identify a selection of representative realistic, feasible accidents that may occur at the aerodrome, this can be achieved by a statistical analysis of previous accidents on aerodromes and by analyzing data from both International National & Local sources.

Phase 3 - Identify the types of aircraft commonly in use at the aerodrome; this is important as the type of aircraft and its configuration has a direct bearing on the resources required in meeting Phase 1 above, it may be necessary to group the aircraft types in relation to common aircraft configurations for ease of analysis or identify precise aircraft type that may have a unique configuration.

Phase 4 - consider the probable location for the most realistic accident type that may occur. To confirm the location of the scenario a facilitator is appointed, using a team of experienced fire service personnel, who have knowledge of the airport and the locations in which an aircraft accident is likely to occur evaluate the scenario. The role of the facilitator is to seek agreement in identifying the credible worst-case locations and by using a scoring system place these locations in order of relevance & priority. The team must determine why the locations have been identified and provide a rationale for each location. One methodology would be to award a weighted number, to

each location, the total numbers can then be added up in relation to each identified location.

Phase 5 - This Phase combines the accident types to be examined as described in Phase 2, with the aircraft identified in Phase 3 and the locations as described in Phase 4. The accident types should be correlated with the possible location, in some cases this could be in more than one location on the aerodrome, for which a task and resource analysis needs to be carried out. The above information is to be built into a complete accident scenario that can be analyzed by experienced supervisors & firefighters for the task and resource analysis in Phase 6.

Phase 6 – The scenario(s) developed in Phase 5 are subject to a task and resource analysis carried out in a series of tabletop exercises/simulations. When carrying out a task and resource analysis the principal objective should be to identify in real time and in sequential order the minimum number of Rescue and Fire-fighting personnel required at any one time to achieve the following:

- a. Receive the message and dispatch the Rescue and Fire-fighting service (the dispatcher may have to respond as part of the minimum riding strength);
- b. Respond utilizing communications, taking appropriate route and achieving the defined response criteria;
- c. Position appliances/vehicles in optimum positions and operate Rescue and Fire-fighting appliances effectively;
- d. Use extinguishing agents and equipment accordingly;
- e. Instigate Incident Command Structure- Supervisors;
- f. Assist in passenger and crew self-evacuation;
- g. Access aircraft to carry out specific tasks if required, e.g. firefighting, rescue;
- h. Support and sustain the deployment of firefighting and rescue equipment;
- i. Support and sustain the delivery of supplementary water supplies;
- j. Need to replenish foam supplies.

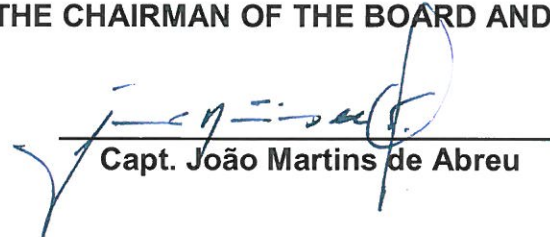
The task and resource analysis should identify the optimum time when additional resources will be available to support/augment and/or replace resources supplied by Rescue and Fire-fighting services (Aerodrome Emergency Management System). It can also provide vital evidence to support the level of Rescue and Fire-fighting vehicles and equipment. In order to start a task and resource analysis the required category of the aerodrome must be identified as required in chapter 3, this should confirm the minimum number of vehicles, and the minimum extinguishing agent requirements and discharge rates, this should also determine the minimum number of personnel required to functionally operate the vehicles & equipment. The results of the analysis should be recorded in a table or spreadsheet format and should be laid out in a method that ensures that the following is recorded:

- a. Receipt of message and dispatch of the Rescue and Fire-fighting response;

- b. Time: This starts from the initial receipt of call and the time line continues in minutes & seconds;
- c. until additional external resources arrive or the facilitator decides an end time;
- d. List of assessed tasks functions and priorities are achieved;
- e. The resources (personnel, vehicles and equipment) required for each task is defined;
- f. Comments to enable team members to record their findings;
- g. Identified Pinch points.

INSTITUTE OF CIVIL AVIATION OF MOZAMBIQUE

THE CHAIRMAN OF THE BOARD AND CEO



Capt. João Martins de Abreu