AERODROME RESCUE AND FIRE-FIGHTING (ARFFS) & EMERGENCY MANAGEMENT SYSTEM

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AN OVERVIEW OF THE IMPORTANCE OF RESCUE AND FIRE-FIGHTING SERVICES AND PROVISIONS OF THE AERODROME EMERGENCY PLANNING
WHAT TIME IS IT?
ICAO PROVISIONS ON ARFFS, AERODROME EMERGENCY PLANNING (AEP) AND DISABLED AIRCRAFT REMOVAL

- Chapter 9
- Section 9.1, Aerodrome Emergency Planning, contains 15 Standards and Recommended Practices (SARPs)
- Section 9.2, Rescue and Fire-Fighting contains 14 Standards and 28 Recommended Practices
- Section 9.3, Disabled Aircraft Removal contains about 2 Recommended Practices.
Due to the nature of their duties and responsibilities, ARFFS contribute to runway incursions and excursions

- Responding to A/C incidents
- Runway inspections
- Bird and wildlife patrols
- Escort duties
ARFFS Chapters 1 up to 17 as per Doc 9137-AN/898 Part 1

- Chapters 1 and 2

  - **Chapter 1** (General Consideration)
    - ARFFS should resort under administrative control of airport management or may be designated to public or private organisation.

  - **Chapter 2** (Level of protection to be provided)

**Table 9-1. Aerodrome category for rescue and fire-fighting**

<table>
<thead>
<tr>
<th>Aerodrome Category</th>
<th>Aeroplane overall length Maximum</th>
<th>Fuselage width</th>
<th>Rescue and Fire-Fighting Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 m up to but not including 9 m</td>
<td>2 m</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>9 m up to but not including 12 m</td>
<td>2 m</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>12 m up to but not including 18 m</td>
<td>3 m</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>18 m up to but not including 24 m</td>
<td>4 m</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>24 m up to but not including 28 m</td>
<td>4 m</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>28 m up to but not including 39 m</td>
<td>5 m</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>39 m up to but not including 49 m</td>
<td>5 m</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>49 m up to but not including 61 m</td>
<td>7 m</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>61 m up to but not including 76 m</td>
<td>7 m</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>76 m up to but not including 90 m</td>
<td>8 m</td>
<td>3</td>
</tr>
</tbody>
</table>
Table 9-2. Minimum usable amounts of extinguishing agents

<table>
<thead>
<tr>
<th>Aerodrome Category</th>
<th>Water (L)</th>
<th>Discharge rate foam solution/minute (L)</th>
<th>Water (L)</th>
<th>Discharge rate foam solution/minute (L)</th>
<th>DCP (kg)</th>
<th>Discharge rate/sec (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>350</td>
<td>350</td>
<td>230</td>
<td>230</td>
<td>45</td>
<td>2.25</td>
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<tr>
<td>2</td>
<td>1 000</td>
<td>800</td>
<td>670</td>
<td>550</td>
<td>190</td>
<td>2.25</td>
</tr>
<tr>
<td>3</td>
<td>1 800</td>
<td>1 300</td>
<td>1 200</td>
<td>900</td>
<td>135</td>
<td>2.25</td>
</tr>
<tr>
<td>4</td>
<td>3 600</td>
<td>2 600</td>
<td>2 400</td>
<td>1 800</td>
<td>135</td>
<td>2.25</td>
</tr>
<tr>
<td>5</td>
<td>8 100</td>
<td>4 500</td>
<td>5 400</td>
<td>3 000</td>
<td>180</td>
<td>2.25</td>
</tr>
<tr>
<td>6</td>
<td>11 800</td>
<td>6 000</td>
<td>7 900</td>
<td>4 000</td>
<td>225</td>
<td>2.25</td>
</tr>
<tr>
<td>7</td>
<td>18 200</td>
<td>7 900</td>
<td>12 100</td>
<td>5 300</td>
<td>225</td>
<td>2.25</td>
</tr>
<tr>
<td>8</td>
<td>27 300</td>
<td>10 800</td>
<td>18 200</td>
<td>7 200</td>
<td>450</td>
<td>4.5</td>
</tr>
<tr>
<td>9</td>
<td>36 400</td>
<td>13 500</td>
<td>24 300</td>
<td>9 000</td>
<td>450</td>
<td>4.5</td>
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<tr>
<td>10</td>
<td>48 200</td>
<td>16 600</td>
<td>32 300</td>
<td>11 200</td>
<td>450</td>
<td>4.5</td>
</tr>
</tbody>
</table>
Chapters 3 and 4

- Chapter 3 (Airport Facilities Affecting ARFFS)
  - Airport’s water supply
  - Emergency access roads (all roads within 90m of the runway)

- Chapter 4 (Communication and Alarm Requirements)
  - Efficiency of ARFFS depends on reliability and effectiveness of its communications and alarm system
  - Portable hand-held radios as well as fixed-base radios
  - Training for all users (PARTAC)
  - Communication is important, e.g. during incidents/accidents, when operating on the manoeuvring area
Chapters 5 and 6

- Chapter 5 (Factors in the Specification for ARFFS vehicles as well as rescue equipment carried on vehicles and maintenance thereof)

- Chapter 6 (Protective Clothing and Respiratory Equipment)
  - Full PPE e.g helmet, bunker gear, proximity suits, boots and gloves.
  - Respiratory equipment (SCBA) to avoid inhalation of toxic fumes.
Chapters 7 - 8

- Chapter 7 (Ambulance and Medical Services)
  - Any decision regarding the provision of such should consider the ambulance facilities available in the area of the airport and their ability to meet the reasonable time.

- Chapter 8 (Extinguishing Agent Characteristics)
  - Foam e.g Protein, AFFF, Fluoroprotein, Film Foaming FluoroProtein etc.
  - Complementary agent e.g CO2 and/or DCP.
  - Storage shall be according to the manufacturer’s specifications.
CHAPTERS 9, 10 & 11

- **Chapter 9 (Fire Stations)**
  - Location of such station shall be at the place where the response time can be met, 2 min not exceeding 3 min under optimum conditions.

- **Chapter 10 (Personnel)**
  - Total number of personnel is determined by the number of vehicles and the ability to discharge at the maximum designed capability of the extinguishing agent.

- **Chapter 11 (Emergency Organisation)**
  - Each airport should have one in order to deal with emergency situations.
CHAPTER 12, 13 & 14

Chapter 12 (Aircraft Fire and Rescue Procedures)
- Contains the following:
  i. **Aircraft fires** - Class A, Hot brakes and Engines
  ii. **Rescue tactics and Equipment** - rescue and protection of occupants - equipment used e.g. hand tools, lighting equipment and power-operated tools.
  iii. **Incidents involving dangerous goods.**

Chapter 13 (Rescue in difficult Environment)
- Types of difficult terrain for which special rescue facilities may be required includes the following:
  i. Sea or large bodies of water adjacent to airport
  ii. Swamps
  iii. Mountains and deserts.
Chapter 14 (Training)

- Training curriculum should include the following areas:
  i. Airport familiarisation
  ii. A/C familiarisation
  iii. Communication
  iv. A/C evacuation assistance etc.

CARs and CATS 139.02.8 and 9

- Training facility and standards
  i. **Training facility** for CAT 1 - 5 can be a fire ground, for CAT 6 - 10 shall be a pressure-fed simulator
  ii. **Training standard** shall be established by CAT 3 - 10
     All FF employees shall be permanently employed and in possession of FF 1, first aid, A/C construction and FF2 or equivalent for all officers.
CHAPTER 15,16 and 17

- **Chapter 15** (Foaming of Runways for Emergency Landings)
  - Should be available on request from a pilot-in-command, however the 200% stock shall be available before the next aircraft lands.

- **Chapter 16** (Aircraft Fuelling Practices)
  - Aerodrome operator must ensure a safe practice while refuelling.

- **Chapter 17** (Availability of AFF information)
  - Aerodrome operator shall make available to the appropriate units the info concerning the level of protection provided at the airport.
ICAO PROVISIONS ON AEP

What is AEP?

The process of preparing an aerodrome to cope with an emergency occurring at the aerodrome or in its vicinity.

What are the objective(s) of AEP?

To minimise the effects of an emergency, particularly in respect of saving lives and maintaining aircraft operations.
ICAO PROVISIONS ON AEP

What do the AEP contain?

- The aerodrome emergency plan sets forth the procedures for coordinating the responses of different aerodrome agencies (or services) and of those agencies in the surrounding community that could be of assistance in responding to the emergency.
ICAO PROVISIONS ON AEP

- **Planning** for AEP should include provisions for, but not limited to:
  - Emergency Operations Centre
  - Command Post
  - Communication System

- **Testing of the Plan**
  - 120 Days until the day of exercise is the planning phase.
  - 1 - 7 days after and 30 days after is the critique session, and the review of the written critique submitted by observers.
  - 14 days after the exercise send a comprehensive report to SACAA.
Chapter 9, Section 9.1

Introductory Note – objectives

9.1.1 (Std) - An aerodrome emergency plan shall be established at an aerodrome, commensurate with the aircraft operations and other activities conducted at the aerodrome
9.1.2 (Std)

Coordination of actions to be taken

Examples of emergencies:

1. Involving aircraft e.g. Off airport, On airport and In Flight
2. Not involving aircraft e.g. Structure, Natural Disaster and Medical Emergencies
3. Compound emergencies e.g. Aircraft/ Structure and Aircraft/ Fuelling Facilities
9.1.3 (Std)

Coordinating responses/participation of existing agencies

Examples of agencies located:

- **on aerodromes** – ATS, RFF, ADM, HEALTH, ACFT OPTRS, SECURITY/POL
- **off aerodromes** – FIRE DEPT, POLICE, MEDICAL, AMBULANCE, HOSPITAL, MILITARY, HARBOUR PATROL
Doc 9137, ASM, Part 7 AEP
9.1.5

An AEP should include:

- Types of emergencies
- Agencies involved
- Responsibility and role of each agency, EOC & Command Post, for each type of emergency
- Coordinates of offices/people to be contacted
- Grid maps of aerodrome & immediate vicinity
- Human Factor Principles
- SCBA from all responding personnel
9.1.7 to 9.1.10

Availability of a fixed emergency operations centre and mobile command post for use during emergency

9.1.11

Need for 2-way communication systems between EOC and FCP and for all airport agencies involved in emergency
9.1.12 & 9.1.13 (Stds)

- Periodic testing & review results
- **Frequency of exercise:**
  - full-scale once every two years
  - partial exercise during intervening years
TERMS OF REFERENCE

- Annex 14: Aerodromes
- Annex 19: SMS
- Annex 18: The Safe Transport of Dangerous Goods by Air
- Doc 9137 AN/898 Part 1 Third edition
- Doc 9137 AN/898 Part 7 Second edition
- CARs
- CATS
THANK YOU