United Nations
International Strategy for Disaster Reduction

# International Fire Aviation Working Group

## International Manual of Common Rules for Fire Aviation

### Practice Guides - Part 2

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## Application of Practice Guides

### 1. Purpose

1.1. These Practice Guides form Part 2 of the International Fire Aviation Guidelines.

1.2. Background material, contextual information, references, key definitions, acronyms, and abbreviations can be found in the International Fire Aviation Guidelines - Framework Document. (Part 1)

1.3. These Practice Guides aim to provide more practical and detailed advice to assist Fire Agencies, Aircraft Operators, Pilots, Air and Ground crews to manage and deliver safe operation of aircraft at fires.

1.4. Countries and Aircraft Operators that already have well developed fire aviation systems may find these Practice Guides a useful checklist.

### 2. Application

2.1. For ease of use these Practice Guides are subdivided into six categories, each with a different prefix.

- FA - Fire Agencies.
- AO - Aircraft Operators.
- AM - Aircraft Management.
- FO - Fire Operations.
- GS - Ground Support.
- SO- Specialist Operations.

2.2. In the context of the Practice Guides the use of the words:

- **“must”** and **“shall”** conveys mandatory compliance.
- **“should”** means compliance is recommended except for justifiable reasons.
- **“may”** and **“can”** indicates optional compliance.

2.3. Each Practice guide is intended to be “stand alone” and cross referenced where possible to other relevant Practice Guides to avoid duplication and error creep.

2.4. Practice Guides apply to both emergency and non-emergency situations, with the exception of the conveyance of passengers or freight by regular public transport flights (i.e. scheduled airline flights).

2.5. Practice Guides apply to all personnel (including employees, volunteers, contractors, other relevant personnel and members of other emergency and land management Agencies) conducting aviation activities under the auspices of the Fire Agencies.

2.6. Practice Guides also apply to interstate and international personnel conducting operations.

2.7. These Practice Guides supersede all other pre-dated aviation related policies, instructions, guidelines and procedures.

## 3. Aircraft at fires

3.1. Aircraft, when used appropriately, have proved to be a safe, efficient and effective resource for managing fire. They are used for a variety of roles in fire management.

- Fixed-wing aircraft are used to detect fires, undertake reconnaissance of fire behaviour and boundaries (including via infra-red line scan), to transport fire crews and undertake water bombing.
- Helicopters are used to transport fire crews onto the fire ground (including winching), provide operational support for crews on the fire ground, identify hotspots via infra-red sensors, undertake reconnaissance, perform as air attack supervision, command or observational platforms and undertake aerial ignition and water bombing.

3.2. Aircraft and aircrew also provide an important resource for ensuring fire crew safety and welfare by monitoring fire behaviour on the ground and development and fire management operations.

3.3. While the benefits of using aircraft for fire management are clear, the increasing costs associated with air operations mean that great scrutiny and management effort needs to be applied to ensure that they remain effective and cost efficient.

3.4. The flowing table indicates typical aircraft cost (2016 prices) and suitable applications for each category of aircraft commonly used in fire operations. It is important to note that the costs do not include fuel, which can add substantially to operational costs. Standby charges are often levied for heavy and medium helicopters. These charges are typically one to two times the hourly rate, per day.

| | Aircraft type: | | | | |
|---|---|---|---|---|---|
| Role | Light Fixed Wing | Fixed wing - ag | Light H/C | Medium H/C | Heavy H/c |
| Detection | Suitable | Some circumstances | Suitable | Not suitable | Not suitable |
| Reconnaissance | Suitable | Not suitable | Suitable | Some circumstances | Not suitable |
| Infrared Camera (FLIR) | Suitable | Not suitable | Suitable | Some circumstances | Not suitable |
| Aerial incendiary | Some circumstances | Not suitable | Suitable | Some circumstances | Not suitable |
| Crew transport | Out of area | Not suitable | Suitable | Suitable | Not suitable |
| Air attack supervision | Suitable | Not suitable | Suitable | Some circumstances | Not suitable |
| Fire mapping | Suitable | Not suitable | Suitable | Not suitable | Not suitable |
| Fire bombing | Not suitable | Suitable | Some circumstances | Suitable | Suitable |
| Crew insertion/ extraction | Not suitable | Not suitable | Suitable | Suitable | Not suitable |
| Mop-up | Not suitable | Not suitable | Suitable | Suitable | Some circumstances |
| Cost per hour | $500 – $1200 | $1500 – $3,000 | $1200 – $1650 | $3000 – $3800 | $4000 – $15,000 |
| Fuel usage per hour | 60-80 | 60-80 | 100-200 | 300-400 | 600-2080 (Aircrane) |
| Example aircraft | Cessna 182, Cessna 206, Partenavia | Airtractor, Dromader, Thrush | Jetranger, Squirrel, Longranger | BK117, Bell 204, (Huey) | Aircrane |

## 4. Voluntary nature of the Practice Guides

4.1. Compliance with the International Fire Aviation Guidelines, including these Practice Guides, is entirely voluntary.

4.2. These Practice Guides are intended to support and enhance any existing fire management guidelines, policies, programs and regulations currently in use by Fire Organisations, Agencies and Governments.

4.3. An individual Fire Agency or Aircraft Operator adopting them may require compliance with all or part of the Practice Guides.

4.4. Two or more Countries, States or Jurisdictions may benefit from forging a bi-lateral or multi-lateral agreement that requires all or part of the Practice Guides to be adopted in particular specified circumstances.

4.5. Although of a non-binding nature, it is envisaged that these Practice Guides could be useful in facilitating the cross-border sharing of information and resources, particularly in response to emergency wildfire situations.

4.6. Jurisdictions sending or receiving aviation-related resources may agree to adhere to part or all of the Practice Guides, or may incorporate them in pre-planned bi-lateral and multi-lateral resource sharing arrangements.

4.7. These Practice Guides are not intended to prejudice or contravene any laws or regulations that administer or regulate aviation in the State where aircraft are operating, or the State in which the aircraft are registered. Where a conflict may exist, the relevant laws take precedence.

4.8. Nothing in these Practice Guides prejudices the rights, jurisdiction and duties of individual countries under international law, conventions and agreements.

## 5. Fire Agency Doctrine

5.1. Fire Agencies should have a system of records that incorporates doctrine, policies, procedures, and processes for Fire Aviation.

5.2. The Fire Agency's system of records should be managed to ensure:

- regular review and updating of documents;
- identification and control of document versions;
- appropriate distribution and make available current versions of relevant documents.

## 6. Safety

6.1. Safety of all persons conducting or present during air operations must be given priority over all other related activities.

6.2. All personnel

- must conduct operations to the highest standards of safety as a matter of routine;
- shall strive to improve safety;
- must understand that they are not expected to unnecessarily expose themselves to undue risk and have the option to refuse or adjust assignments that they consider to be too hazardous.

6.3. Fire Agencies, and Aircraft Operators must have specific, defined aircraft safety programs that:

- clearly define organisational and management commitment to safety;
- have effective mechanisms for promotion of aviation safety throughout the organisation;
- provide quality controlled processes for communication of safety related information;
- include processes for reporting safety issues that encourage personnel to report issues;
- identify, investigate and rectify safety issues

6.4. All aviation related activities must be conducted so as to comply with:

- relevant legislative and Agency occupational health and safety requirements
- the requirements any Aviation Authority
- Practice Guides for the activity

6.5. Situations known to pose particular risks in aerial firefighting operations include, but are not limited to the following:

- fatigue;
- sleep inertia;
- dehydration and heat stress;
- mid-air proximity or collision (including between firefighting aircraft, or between firefighting aircraft and itinerant aircraft);
- runway or landing area overrun or excursion on landing or take off for fixed wing aircraft
- dynamic rollover, uneven landing surfaces for helicopters;
- settling with power or overpitching (helicopter);
- failing to climb under excessive downdraft conditions;
- manoeuvring whilst heavily loaded, leading to incipient stall and spin (aeroplane);
- operating in the height/velocity curve, loss of tail rotor effectiveness, vortex-ring state (helicopter);
- Exceeding weight and centre of gravity limitations;
- Bad weather including excessive winds, turbulence and pyro Cu/Cb turbulence;
- ground handling, collision with objects during ground handling or ground manoeuvring;
- ground risks particularly including risks posed by moving aircraft, propellers, rotors and downwash;
- dropping articles from aircraft.

6.6. The risk of ‘Missionitis’ where pilots and aircrew become stressed and fatigued and then potentially begin to place more emphasis on mission accomplishment and less on safety needs to be closely monitored and controlled.

6.7. Whilst pilots have ultimate accountability for the safety of aircraft and all those on board, it is important to recognise that all personnel involved in aviation operations have a responsibility for safety. This includes assessing risks, reporting hazards and monitoring operations

6.8. The pilot and/or the flight crew member should be authorised to prohibit the entry into an aircraft of any person that they deem to be a safety risk to aircraft operations.

## 7. Aviation Training and Accreditation

7.1. All personnel carrying out aviation duties, roles or operations should meet relevant training and accreditation requirements.

7.2. Only personnel who are authorised, accredited and current should be primary holders of Air Operations Unit or other Agency aviation roles under the Incident Control System (ICS).

7.3. Only qualified and experienced personnel must be used for the following specialist positions: Air Operations Manager, Air Attack Supervisor, Aircraft Officer, Air Base Manager, Helibase Manager, Air Observer and Incendiary Operations Supervisor.

## 8. Support systems

8.1. The Fire Agency and Aircraft Operators must ensure that appropriate systems, procedures and resources are in place to properly support aviation operations.

8.2. Support systems may include:

- appropriate systems for reliably communicating with aircraft;
- if not otherwise provided by another agency (such as Air Traffic Control) or by the Aircraft Operator, an appropriate automatic or procedural system for monitoring the position and status of aircraft conducting operations for the Agency (usually known as a “Flight Notification and Flight Following System”);
- procedures for producing an accurate manifest of the names of each person on board any aircraft conducting operations for the Agency,
- procedures for providing logistic support to aircraft operations including, where required, the provision of consumables.

8.3. The Fire Agency must have in place suitable systems for documenting aircraft activities, along with processes for archiving and retrieving records.

8.4. The Fire Agency must have in place administrative systems, where applicable, for determining, verifying and governing appropriate payments to Aircraft operators for services provided.

## 9. Environmental Protection

9.1. Fire Agencies should have in place policies and procedures for protecting the natural environment, as far as practicable, during fire aviation operations. Consideration should be given to:

- procedures for safe handling of aviation fuels and lubricants;
- procedures for safe handling of fire retardants and suppressants;
- “good neighbour” practices to minimise the adverse effects of aircraft noise.

## 10. Evaluation and improvement

10.1. Fire Agencies and Aircraft Operators should have in place clear performance measures for the effectiveness and efficiency.

10.2. Fire Agencies and Aircraft Operators should have in place processes to monitor, evaluate and analyse the effectiveness and efficiency against their performance standards.

10.3. Fire Agencies and Aircraft Operators should have a program of research and development aimed at improving the overall safety, efficiency and effectiveness of Fire Aviation.

## 11. Lessons Learned

11.1. Fire Agencies, and Aircraft Operators should develop aircraft safety programs that:

- quickly investigate safety related incidents and near-misses in a non-punitive manner;
- communicate, report and share findings, recommendations and lessons learnt from safety investigations to other organisations.

## 12. Review Process

12.1. TBA